ASTERACEAE (COMPOSITAE)

菊科 jù ke

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Herbs, subshrubs, or shrubs, rarely trees or climbers, bisexual, monoecious, or sometimes dioecious, many with laticiferous
cells or canals and/or resinous ducts. Leaves often in a basal rosette; cauline leaves usually alternate, more rarely (in China) opposite
or whorled, sessile or petiolate, without stipules; petiole sometimes auriculate at base; leaf blade entire to variously lobed or divided.
Florets bisexual (perfect), female (pistillate), or functionally male (functionally staminate), solitary or few to many enclosed in
an involucre of 1- to many-seriate phyllaries (involucral bracts) to form a capitulum; calyx of outer bracts sometimes present and
often differing markedly from phyllaries. Capitula solitary or few to many arranged in variously formed synflorescences, homog-
amous or heterogamous, discoid, disciform, radiate, subradiate, radiant, or ligulate; receptacle usually flattened, sometimes
conically or convexly, rarely conical, smooth or alveolate, paleate (scaly) or epaleate, with bristles, scales, hairs, or naked. Corolla (3–)
5-merous, gamopetalous, tubular or tubular-filiform, and regular, bilabiate, radiate, or ligulate. Stamens (4 or)5, inserted within cor-
olla tube; filaments adnate to proximal part of corolla; anthers basifixed or dorsifixed, usually coalescent into a tube, base caudate or
not, apex with (rarely without) a sterile, ovate or lanceolate appendage; pollen grains usually tricolporate, echinate or sometimes
lophate or spinulate, often caveate. Style apically bifid (rarely entire); style branches variously shaped, with or without an apical
appendage, hairs, or papillae. Ovaly inferior, 1-loculed; ovule 1, basal, anatropous. Fruit an achene (cypsela). Pappus consisting of 1
to many rows of scales or bristles, or absent. Seed erect; endosperm scanty; embryo straight.

Between 1,600 and 1,700 genera and ca. 24,000 species: cosmopolitan (except Antarctica); 15 tribes (one introduced), 248 genera (18 endemic, 49 introduced), and 2,336 species (1,145 endemic, 109 introduced) in China.

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Taxonomic discussion on the Asteraceae is included under the relevant tribes. The following notes apply to the whole family. Modes of reproduction in the Chinese Asteraceae are known only fragmentarily. As regards the world diversity of the family, only about 12% of genera have been studied using cytogenetics to identify the reproduction system. In 3%, agamospermy was found to occur. Probably the most common reproduction system is allogamy with a sporophytic self-incompatibility; occasional selfing is also possible (stigma ageing or mentor effect). More or less obligate autogamy is relatively rare. Other uncommon reproduction systems include gynodioecy, a very rare dioecy (with heterogametic females). Asexual reproduction is a widespread phenomenon in the Asteraceae, with a wide range of mechanisms. In addition to the rare adventitious embryony, there are common types of autonomous apomixis, agamospermy (apopory, diplospory) associated with various forms of embryogenesis (parthenogenesis, agamous). All the types of reproduction are to be considered in the evaluation of population variation and for taxonomic conclusions because the prevailing type of reproduction substantially influences the variation limits of taxa.


Glossary of botanical terms used in the Asteraceae

Accepted terms are indicated by boldface. Within the definitions, italics (when not names of genera) indicate terms that are defined in this glossary.

achene – the fruit of Asteraceae; a usually dry, indehiscent, 1-locular, 1-seeded fruit derived from a 2-carpellate, inferior ovary. Some authors prefer to use the term cypsela for the fruit of Asteraceae and restrict the term achene to a dry, 1-seeded fruit derived from a 1-carpellate, superior ovary (e.g., in Ranunculus in Ranunculaceae).

alveolate – honeycombed; usually referring to a ± pitted receptacle, in which the pits or sockets may be round or ± polygonal in cross section, socket margins may be entire, erose, fimbriate, or lacerate; cf. foveolate.

anther appendage – sterile tissue extending distally beyond pollen sacs as a continuation of an anther connective.

anther collar – see antheropodium.

antheropodium (plural antheropodia) – literally “anther foot”; a region of usually thick-walled cells in a staminal filament just proximal to its anther; the collar may be balusterform (as in Seneceae), i.e., proximally with enlarged cells, or straight and (semi)cylindrical and made up of uniformly sized cells (as in Ligularia and Paravesenecia).

anther tails – sterile tissue extending from the base of a pollen sac; anther tails may be simple or ± branched and often have a characteristic form within taxa; some tribes of Asteraceae characteristically have tailed (also called caudate) anthers.

anther tube – in Asteraceae, the five anthers are joined laterally into a tube through which the style emerges.

antrorse – directed toward the apex; lateral elements of barbellate or plumose awns or bristles of a pappus may be described as antrorse; cf. retrorese.

apical anther appendage – see anther appendage.

apical plate – the apical achene area on the periphery of which the pappus is inserted; sometimes also called pappus disk.

apical rim – a ± salient ring outside the pappus insertion, surrounding the apical plate (characteristic of Cardueae).

aristate scale – see pappus.

attachment scar – the area near the base of the achene where it was attached to the receptacle.

awn – see pappus.

balusterform – referring to an antheropodium that is proximally markedly dilated with enlarged cells (as in some Senecioideae).

barbellate (diminutive barbellululate) – usually refers to a pappus awn or bristle with lengths of lateral elements (free cell ends, usually called barbs) less than or subequaling the diameter of the shaft of the awn or bristle; see also plumose and scabrid.

basal anther appendages – see anther tails.

beak – see rostrum.

bilabiate corolla – a corolla with 2 lips, usually an outer lip with 3 lobes or teeth and an inner lip with 2 often linear lobes (e.g., in some Mutisieae).

bisequal floret (sometimes referred to as hermaphroditic floret or perfect floret) – florets possessing both an anther cylinder and a style, usually both fertile although in some taxa florets may be functionally male or female.

bristle – see pappus.

calathium or calathidium (plural calathia or calathidia) – see capitulum.

calcarate anthers – anthers with the filaments inserted ± abaxially on the connective, distal to (above) the bases of the paired pollen sacs (e.g., in Vernonia).

calycular bracts – the individual bracts making up the calyculus.

calyculate – bearing a calyculus.

calyculus (plural calyculi) – collectively, 1 or more bracts or bracteoles subtending an involucre, usually readily distinguished from the phyllaries (e.g., in Seneceio and Taraxacum).

capitulecence – see synflorescence.
capitulum (plural capitula) – the inflorescence in Asteraceae and certain other families; sometimes called a head; a capitulum comprises an involucre of phyllaries (sometimes subtended by a calyxulus), a receptacle, and (1–)5–100–1000 or more florets; the florets are borne on the face of the receptacle.

carpopodium (plural carpopodia) – literally “fruit foot”; the basal, sterile portion of an achene at its point of attachment to a receptacle; carpopodia are sometimes diagnostic in shape and cellular form (e.g., in some Eupatorieae) and sometimes negligible or essentially absent.

caudate anthers – tailed anthers; see anther tails.

chaff – paleae, see receptacle.

compressed achene – usually, cross sections of achenes are ± circular or polygonal and isodiametric; sometimes, achenes are compressed or ± flattened either (1) laterally with the longer dimension of the cross section of each achene parallel to a radius of the capitulum (as in Helenium) or (2) dorsiventrally with the longer dimension of the cross section of each achene perpendicular to a radius of the capitulum (as in Coreopsis).

corolla limb – in a disk floret, the corolla limb is the portion of the corolla distal to the insertion of the staminal filaments (i.e., corolla limb = corolla throat + corolla lobes of a disk corolla); in a ligulate floret, the corolla limb is called a ligule; in a ray floret, it is called a lamina.

corolla lobes – the lobes of a corolla.

corolla throat – usually, throat refers to the portion of a corolla distal to insertion of staminal filaments (i.e., distal to the corolla tube) and proximal to the corolla lobes; the throat may be gradually or abruptly ampullate (enlarged) relative to the tube.

corolla tube – usually, the portion of a corolla proximal to insertion of the staminal filaments; also, the ± cylindric portion of a corolla proximal to the ± flat corolla limb in a ligulate floret or a ray floret.

corona – a crown-shaped pappus; or, in Anthemideae (which lack a true pappus), the apex of the achene may be produced into an entire to deeply divided, crown-shaped, sometimes pappuslike structure.

cypsela (plural cypselae) – see achene.

disk corolla – corolla of a disk floret.

disk florets – central florets of a disciform capitulum, radiant capitulum, or radiate capitulum, or all florets of a discoid capitulum; disk florets usually have actinomorphic corollas; disk florets may be bisexual (most common), functionally male (moderately common), or female (relatively rare, e.g., in Antennaria, and in Cueva when dioecious).

disciform capitulum – a heterogamous capitulum with actinomorphic corollas in all florets, with marginal florets that are female or neuter (and usually with ± attenuate to filiform corollas), and with central florets usually bisexual, sometimes functionally male. By tradition, both the marginal, female florets and the central, bisexual or functionally male florets in disciform capitula have been referred to as disk florets.

discoid capitulum – a homogamous capitulum with actinomorphic corollas in all florets (similar in marginal and central florets) and all florets either bisexual or functionally male or female.

distant – in reference to Asteraceae, the opposite of imbricate, in an involucre where the phyllaries do not overlap but are clearly in more than one series.

ecalcarate anther – anthers not calcarate.

calyculate – lacking a calyxulus.

ecaudate anthers – anthers not caudate or tailed; see anther tails.

ecdthetic tissue – wall structure of pollen sacs with cell thickenings; the endothecium is radial if the wall thickenings are restricted to vertical cell walls (e.g., in Senecio), and polarized if restricted to horizontal walls (e.g., in Ligularia); intermediate types occur (e.g., in some Sinosenecio).

epaleaceous – see paleate.

epaleate – lacking paleae; see receptacle.

epappose – lacking a pappus.

female floret (sometimes referred to as pistillate floret) – describes a floret with a fertile, functional ovary and style (i.e., capable of producing a viable seed) and lacking stamens.

filament collar – see anthropodium.

filiform floret – a marginal floret of a disciform capitulum or sometimes a discoid capitulum; filiform florets are female, always without staminodes, and have narrowly tubular corollas apically subtruncate, or with 2 or 3 minute teeth or a minute lamina.

floret – an individual flower in a capitulum.

fovealate – shallowly pitted; cf. alveolate.

functionally male floret (sometimes referred to as functionally staminate floret) – a floret that has fertile anthers and a sterile ovary, i.e., a floret producing functional pollen and not capable of producing a viable seed; styles of functionally male florets usually are not branched and usually lack stigmatic papillae. Although strictly correct, the word “functionally” is often omitted.

gland-dotted – surfaces of Asteraceae, especially leaves and phyllaries, sometimes bear sessile, sessile, or sunken, multicellular glandular hairs; such surfaces have been described as gland-dotted, glandular punctate, punctate, or punctate glandular; here, such surfaces are described as gland-dotted.

glandular punctate – see gland-dotted.

glomerule – a condensed, usually ± globose cluster of capitula (e.g., in Eremanthus Lessing, not in China, and Gamochaeta); cf. pseudocephalium.

glomeruliferous floret – see bisexual floret.

head – see capitulum.

hermaphrodite floret – see bisexual floret.

heterogamous capitulum – a capitulum with florets of two or more sexual forms.

homogamous capitulum – a capitulum with all florets of one sexual form, usually all bisexual, all functionally male, or all female.

imbricate – partially and ± regularly overlapping, as shingles (tiles) of a roof; phyllaries of an involucre are often imbricate.

inflorescence – in Asteraceae, the primary inflorescence is a capitulum; in the sense of a compound inflorescence with multiple capitula, see synflorescence.

involutral bracts – see phyllaries.

involucral phyllaries collectively; an involucre is the bracts or bracteoles borne at the periphery of a receptacle, exterior to the florets of a capitulum.

lamina (plural laminae) – in ray florets, the ± flat, ± strap-shaped corolla limb of the zygomorphic corolla; a lamina usually has 2 or 3 apical lobes or teeth; it is sometimes referred to as a ray and, incorrectly, as a ligule.
ligulate capitulum – a capitulum with all florets bisexual and ligulate; the corolla limb is called a ligule, is ± flat and ± strap-shaped, and is apically 5-lobed or 5-toothed; ligulate capitula are characteristic of Cichorieae.

ligulate floret – a floret in which the corolla limb is zygomorphic, ± flat, and ± strap-shaped with 5 apical lobes or teeth; the ± flat corolla limb of a ray floret has been called a ligule, whereas here it is called a lamina.

ligule – the ± flat, ± strap-shaped corolla limb of a ligulate floret.

male floret – see functionally male floret.

marginal florets – the single or multiple series of florets around the edge of a capitulum and surrounding the central disk florets; marginal florets may be (but are not necessarily) ray florets.

neuter floret – describes a ray floret that lacks a style.

palea (plural paleae) – bracts borne on a receptacle of a capitulum; usually, each palea subtends an individual floret; paleae are usually herbaceous, membranous, or scarious and may be persistent, ± caducous, or shed together with achenes; paleae have been called receptacular bracts or receptacular paleae; scales of the pappus also have been called paleae.

paleaceous – palea-like; for the sense of bearing paleae, see paleate.

paleate – bearing paleae; see receptacle.

pappose – bearing a pappus.

pappus (plural pappi) – collectively, awns and/or bristles and/or scales corresponding to a calyx borne apically on ovaries (ultimately achenes) of Asteraceae. A pappus may be ± persistent or ± caducous; when persistent it is sometimes involved in dispersal of achenes. A pappus may include more than one kind of element (e.g., awns, bristles, and/or scales); the elements may be distinct or ± connate and may occur in 1–5 or more series. Scales that are very short may be only arbitrarily distinguishable from awns or bristles. The distinction between awns and bristles is also sometimes arbitrary. Generally, cross sections of bristles and awns are ± circular or polygonal and have the longer diameter no more than 3 × the shorter diameter. Pappus elements with ± flat cross sections (i.e., longer diameter of cross section more than 3 × the shorter diameter) are called scales, regardless of relative lengths of the elements. As used here, subulate scale means much the same as flattened bristle. Bristles may be relatively pliable to relatively stiff. Bristles with diameters less than ca. 50 µm are usually called barbellate, barbellulate, or plumose. A pappus scale may terminate in one or more bristlielike or awnlike appendages; such scales are said to be aristate.

pappus disk – see apical plate.

pedicel – strictly referable to the stalk of an individual floret, such as may be found in many species of Cotula.

peduncle – a stalk (stem) supporting a single capitulum.

perfect floret – see bisexual floret.

peripheral florets – see marginal florets.

phyllaries (singular phyllary) – the bracts or bracteoles borne at periphery of a receptacle, exterior to the florets of a capitulum, collectively an involucre; in fruit, phyllaries are sometimes shed together with achenes (e.g., in Acanthospermum, Parthenium, and Xanthium).

pistillate floret – see female floret.

plumose – featherlike or bearing feathers; in reference to Asteraceae, plumose usually refers to a pappus bristle with lengths of lateral elements 1–3 or more × the diameter of the shaft of the bristle; see also barbellate and scabrid.

pseudobiliabiate corolla – a corolla with a 4-lobed outer (abaxial) lip and a simple (not lobed) inner (adaxial) lip (e.g., in Barnadesia Mutis ex Linnaeus f., not in China).

pseudoecephalium (plural pseudoecephalia) – literally “false head”; an aggregation of capitula into a secondary, capitulum-like synflorescence (e.g., in Echinops, Elephantopus, and Sphaeranthus); cf. glomerule.

punctate – see gland-dotted.

punctate glandular – see gland-dotted.

radiant capitulum – a heterogamous capitulum with marginal florets usually neuter (sometimes female) with corollas usually 5-lobed, notably enlarged (relative to corollas of central florets), and actinomorphic to ± zygomorphic (e.g., in Centaurea s.l.) and with central florets usually bisexual with 5-lobed, actinomorphic corollas.

radiate capitulum – a heterogamous capitulum with marginal ray florets and central disk florets.

ray – see lamina.

ray corolla – the corolla of a ray floret.

ray florets – in a radiate capitulum, the marginal florets that are neuter, female, or styliferous and sterile with zygomorphic corollas. The corolla limb of a ray corolla is called a lamina and is ± flat, ± strap-shaped, and (0–)2- or 3(or 4)-lobed or -toothed; it has been called a ligule, but here ligule is used for the corolla limb of a ligulate floret.

receptacle (adjective receptacular) – in reference to Asteraceae, the portion of a capitulum that bears phyllaries peripherally and florets on its face; transition from apex of peduncle to receptacle is imperceptible and the distinction is arbitrary; faces of receptacles may be concave, flat, convex, conical, or cylindrical and may be paleate or eulate (eulate receptacles are sometimes described as naked). Paleate receptacles are sometimes said to be chaffy and the paleae, collectively, are sometimes called chaff. Eulate receptacles may bear ± subulate enations (e.g., in Grindelia) or bristles or subulate to linear scales (e.g., in some Cardueae) or hairs (e.g., in some Anthemideae) among florets, or eulate receptacles may be ± foveolate with margins of sockets notably lacerate; such eulate receptacles may be mistaken for paleate receptacles.

retrorse – directed toward the base; lateral elements of barbellate or plumose awns or bristles of a pappus may be described as retrorse; cf. antrorse.

rostrate – bearing a rostrum.

rostrum (plural rostra) – a distal, attenuated portion of an achene (e.g., in Taraxacum).

scabrid – used to describe capillary pappus bristles with lateral extensions that are shorter than those in barbellate bristles; see also plumose.

scale – see pappus.

scape – properly, a leafless and simple flowering stem of a plant that has leaves in basal rosettes; the peduncle of some Asteraceae (e.g., in Taraxacum) is sometimes called a scape.

scapiform – resembling a scape.

scrobiculate – refers to a receptacle covered with low mounds of tissue with furrows between, the top of each mound occupied by the remains of the vascular bundle.
seta (plural setae) – a bristle or bristlelike structure; with reference to Asteraceae, setae are usually elements of a pappus.

setiferous – bearing setae.

setula (plural setulae) – diminutive of seta (setae); small hairs usually on an achene, including twin hairs.

setuliferous – bearing setulae.

squamella (plural squamellae) – a relatively small scale; scales of a pappus are sometimes called squamellae.

staminate floret – see functionally male floret.

stereome – a central, ± hardened portion of a phyllary; individual stereomes may be undivided or divided into two lobes (e.g., in Gna- phaliceae).

stigmatic area – area of a style branch covered with stigmatic papillae, present as areas covering the inside of the style branch or separated into two marginal bands that may sometimes fuse toward the apex of the style branch.

style arm – see style branch.

style branch – in reference to Asteraceae, one of the two branches of a style; usually, each style branch bears stigmatic papillae on the inner (adaxial) face, at least proximally; in functionally male florets, styles are usually not branched and usually lack stigmatic papillae.

style branch appendage – see style branch tip.

style branch tip – the portion of a style branch beyond the stigmatic area (sometimes termed style branch appendage); the forms of style branch tips are sometimes characteristic of tribes or subtribes.

stylicherous and sterile – describes a ray floret that has a style but is seed-sterile, i.e., it has an infertile ovary, unable to produce a seed.

stylopodium (plural stylopodia) – literally “style foot”; usually, a nec-
tary at the base of a style.

subimbricate – less than imbricate; weakly overlapping.

subinvolucral bracts – individual bracts surrounding or below an invo-
lucre, sometimes subtending individual peduncles, e.g., in Mikania.

subplumose – less than plumose.

subradiate capitulum – a heterogamous capitulum with the ray florets not exceeding the phyllaries.

sweeping hairs – dorsal projections from the abaxial side of the style branches. Their function is to collect pollen from the pollen sacs as the style grows up through the anther tube; the distribution and shape of sweeping hairs are often taxonomically useful.

synchronium (plural synchronia) – see synflorescence.

synflorescence – a compound inflorescence; any arrangement of multiple capitula on a capitulum-bearing shoot; a synflorescence can be corymbiform, paniculiform, racemiform, spiciform, etc., or capitulum-like; see also glomerule and pseudocephalium.

twin hairs – translation of the German Zwillingshaare, sometimes referred to as duplex hairs although usually 3-celled (2 parallel cells plus 1 smaller basal cell); twin hairs are often found on achenes of Asteraceae and are sometimes called setulae.

umbon – a ± conical or polyhedral projection or boss; in some Aster-
aceae, a usually waxy structure associated with a pappus (e.g., in Jurinea).

umbonate – bearing an umbo.

xylopodium (plural xylopodia) – literally, “wood foot”; a ± woody, subterranean caudex or rootstock that is derived from the hypocotyl and roots.

Systematic list of tribes, subdivisions of tribes, and genera

- Indicates endemic genus

1. Mutisieae (p. 9)
   1. ● Nowelia
   2. Leucomeris
   3. Adenocaulon
   4. Leibnitzia
   5. Gerbera
   6. Piloselloides
   7. Ainsliaea
   8. Pertya
   9. ● Myriopoids

2. Echinopeae (p. 33)
   10. Echinops

3. Carlineae (p. 39)
   11. Carlina
   12. Atractylodes
   13. Tagarinovia
   4. Cardueae (p. 42)
   1. Saussurea group
   14. Jurinea

5. Centaureinae
   2. Arctium group

6. Cichorieae (p. 195)
   15. ● Diplazoptilon
   16. Himalaiella
   17. Dolomiaeae
   18. ● Bolocephalus
   19. Frolovia
   20. Aucklandia
   21. Hemisteptia
   22. Saussurea
   2. Arctium group
   3. Adenocaulon
   4. Leibnitzia
   5. Gerbera
   6. Piloselloides
   7. Ainsliaea
   8. Pertya
   9. ● Myriopoids

16. Himalaiella
32. Ancitha
49. Cyanus
50. Centaurea
5. Centaureae (p. 195)
33. Cirsium
34. Carduus
5. Centaureinae
35. Rhaponticum
36. Oligochaeata
37. Klasea
38. ● Archiserratula
39. Tricholepis
40. Amberboa
41. Plagiobasis
42. Russowia
43. Schischkinia
44. Serratula
45. Rhaponticoides
46. Psephellus
47. Crupina
48. Carthamus

49. Cyanus
50. Centaurea
51. Scorzonera
52. Podoperperum
53. Koelpinia
54. Epilasia
55. Tragopogon
56. ● Faberia
57. Cicerbita
58. Melanoseris
59. Parapanthenes
60. Notoeris
61. Lactuca
62. Launaea
63. Sonchus
64. Chondrilla
65. Crepis
66. Youngia
67. Lapsanastrum
68. Crepis dianthera
69. Crepis aestivalis
70. Crepis alsatica
71. Crepis ammobium
72. Crepis capillaris
73. Crepis caucasica
74. Crepis mairei
75. Crepis sonchifolia
76. Crepis dubyana
77. Crepis acaulis
78. Crepis tomentosa
79. Crepis anisata
80. Crepis alpina
81. Crepis aestivalis
82. Crepis acaulis
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95. Crepis alpina
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109. Crepis aestivalis
110. Crepis aestivalis
111. Crepis aestivalis
112. Emilia
113. Pericallis
114. Hainanecio
8. Astereae (p. 545)
115. Nannoglottis
116. Dichocephala
117. Cyathochne
118. Grangea
119. Myriactis
120. Thespis
121. Eschenbachia
122. Microglossa
123. Bells
124. Triplium
125. Galatella
126. Crinitina
127. Asterothamnus
128. Arctogeron
129. Turzaninovia
130. Lagerophora
131. Caloris
132. Callistephus
133. Formania
134. Heteroplexis
135. Psychrogeton
136. Neobrachyactis
137. Sheareria
138. Rhinaactinidia
139. Aster
140. Solidago
141. Eriogonum
142. Eurybia
143. Grindelia
144. Symphyotrichum
9. Anthemideae (p. 653)
145. Crotula
146. Soliva
147. Ajania
148. Ajaniopsis
149. Brachanthes
150. Chrysantheme
151. Artemisia
152. Seriphidium
153. Croscophyllum
154. Filifolium
155. Neopallasia
156. Allardia
157. Cancrinia
158. Richteria
159. Handelisia
160. Pseudohandelia
161. Hippolytia
162. Kaschgarica
163. Leucachainema
164. Microcephala
165. Opisthopappus
166. Silpnoplepis
167. Achillea
168. Anthemis
169. Tanacetum
170. Tripleurospermum
171. Matricaria
172. Glehnia
173. Leucanthemum
10. Gnaphalieae (p. 774)
174. Filago
175. Phagnalon
176. Gaugacanth
177. Leontopodium
178. Sinoleontopodium
179. Antennaria
180. Gnomophalium
181. Gnaphalium
182. Anaphalis
183. Pseudognaphalium
184. Xerochrysum
185. Helichrysum
11. Calenduleae (p. 819)
186. Calendula
12. Inuleae (p. 820)
187. Buphthalmum
188. Carpesium
189. Pulicaria
190. Pentanema
191. Blumea
192. Inula
193. Dhaldea
194. Spaeranthus
195. Pterochara
196. Epaltes
197. Pluchea
198. Karelina
199. Laggera
200. Pseudoconyza
13. Athroismeae (p. 851)
201. Anisopappus
14. Heliantheae (p. 852)
202. Tagetes
203. Pectis
204. Flavera
205. Glossocarida
206. Cosmos
207. Bidens
208. Coreopsis
209. Enydra
210. Acenella
211. Zimia
212. Tridax
213. Galinsoga
214. Acanthospermum
215. Guzotia
216. Sisexbeckia
217. Smallanthus
218. Blainvillea
219. Synedrella
220. Calypoxylon
221. Eleutheranthera
222. Eclipsa
223. Glibium
224. Sphagneticola
225. Melanthrea
226. Wollastonia
227. Scerospermum
228. Lagaceae
229. Rudbeckia
230. Tithonia
231. Helianthus
232. Xanthium
233. Ambrosia
234. Parthenium
235. Gaillardiaceae
15. Eupatorieae (p. 879)
236. Ageratina
237. Mikania
238. Adenostemma
239. Gymnocoronis
240. Ageratum
241. Eupatorium
242. Astrovapertium
243. Praxelis
244. Chromolaena
245. Conoclinium
Genera incertae sedis (p. 892)
246. Cueva
247. Centipeda
248. Symphylocarpus
Key to tribes

1a. Capitula of 2 kinds, either with only functionally male florets or with only female florets; flowering not precocious.
2a. Plants monoecious, with male and female capitula on same plant .................................................. 14. Heliantheae (p. 852)
2b. Plants dioecious, with male and female capitula on different plants.

3a. Leaves spiny ..................................................................................................................................... 3. Carlineae (Teguariovia; p. 39)
3b. Leaves not spiny.
4a. Shrubs ...................................................................................................................................... 1. Mutisieae (Myrioplois, rarely Pertya; p. 9)
4b. Herbs.
5a. Phyllaries papyraceous; female florets filiform ........................................................................ 10. Gnaphalieae (Antennaria; p. 774)
5b. Phyllaries herbaceous; female florets tubular, apically 3- or 4-lobed ........................................... 246. Cævea (p. 892)

1b. Capitula all alike, homogamous or heterogamous, rarely plants subdioecious and then flowering precocious.
6a. Fertile achenes with conspicuous stipitate glands ......................................................... 1. Mutisieae (Adenocaulon; p. 9)
6b. Fertile achenes without conspicuous stipitate glands.

7a. Capitula homogamous and all florets ligulate, i.e., corollas with an expanded abaxial, apically 5-toothed, 5-lobed, or 5-cleft limb; latex (milky juice) present ..................................................... 5. Cichorieae (p. 195)
7b. Capitula heterogamous, or if homogamous then corollas tubular and 5-lobed or zygomorphic and pseudiligulate (5-lobed with one deeper cleft or sinus); plants without or rarely with latex.

8a. Capitula homogamous; corollas pseudoligulate, 5-lobed and zygomorphic.
9a. Capitula in bracteate glomerules; phyllaries 8, decussate; style branches very short or scarcely bilobed ............................................................. 6. Vernonieae (Elephantopus, Pseudelephantopus; p. 354)
9b. Capitula not in bracteate glomerules; phyllaries not decussate; style branches very short or scarcely bilobed ............................................................. 1. Mutisieae (Amslieae, Pertya; p. 9)

8b. Capitula heterogamous (marginal florets with a strap-shaped, entire or 2–4-toothed or 2–4-lobed outer limb) or homogamous and corollas 3–5-lobed, actinomorphic.

10a. Capitula with all or some florets bilabiate or pseudobilabiate (slightly zygomorphic) .......................... 1. Mutisieae (Gerbera, Leibnizia, Nouelia, Piloselloides; p. 9)
10b. Capitula lacking bilabiate florets.

11a. Capitula each with only 1 floret, aggregated into a terminal globose pseudocephalium; leaves spiny ................................................................. 2. Echinopeaeae (p. 33)
11b. Capitula with more than 1 floret, or if with only 1 floret then leaves not spiny.

12a. Leaves at least below synflorescence opposite or mostly so.
13a. Style branch tips longer than stigmatic lines, prominent; capitula discoid; corollas never yellow ......................................................................................... 15. Eupatorieae (p. 879)
13b. Style branch tips shorter than stigmatic lines, or absent; capitula radiate, disciform, or discoid; corollas often yellow ........................................................................... 14. Heliantheae (p. 852)
12b. Leaves all alternate.
14a. Style shaft and branches glabrous ...................................................................................... 1. Mutisieae (Leucomeris; p. 9)
14b. Style shaft glabrous or with hairs or evident papillae in distal part and/or style branches with hairs or evident papillae abaxially or apically or on an apical appendage.

15a. Disk corollas 3- or 4-merous.
16a. Receptacle with scales ........................................................................................................... 248. Symphylocarpos (p. 893)
16b. Receptacle without scales.

17b. Achenes subterete, broadly ribbed ................................................................................. 247. Centipeda (p. 892)
15b. Disk corollas or all corollas 5-merous.

18a. Style shaft with a papillose-pilose thickening below branches; leaves spiny, at margin finely serrulate-spinulose, or not spiny.
19a. Achene densely hairy, capitula homogamous, plants biennial or perennial, and leaves never grasslike; pappus inserted directly on upper edge of achene, not surrounded by a rim ................................................................................... 3. Carlineae (p. 39)
19b. Achene glabrous or subglabrous, rarely densely hairy but then capitula radiant, plants annual, or leaves grasslike; pappus insertion surrounded by a ± conspicuous rim or crown ................................................. 4. Cardueae (p. 42)
18b. Style shaft without a papillose-pilose thickening below branches; leaves neither spiny nor at margin finely serrulate-spinulose.
20a. Achenes large, heteromorphic, outer cymbiform or curved, inner strongly curved to circular; receptacle epaleate; pappus absent ......................................................... 11. Calenduleae (p. 819)

20b. Achenes small, columnar or compressed, straight or only slightly curved, homomorphemic or only slightly heteromorphic, if large then receptacle paleate; pappus present or absent.

21a. Phyllaries rather dry, either with distinct scarious margin or papery, brownish, yellowish, or whitish, never herbaceous and green throughout.

22a. Anthers rounded at base; phyllaries with distinct pale or brownish scarious margin ................................................................. 9. Anthemideae (p. 653)

22b. Anthers tailed at base; phyllaries papery, whitish, brownish, or yellowish, especially in distal part ......................................................... 10. Gnaphalieae (p. 774)

21b. Phyllaries herbaceous, all or at least outer ones green throughout, except at very apex.

23a. Style branches long, slender, subulate, without an apical appendage, hairy abaxially and with stigmatic papillae over entire adaxial surface; capitula homogamous ................................................................................................................. 6. Vernonieae (p. 354)

23b. Style branches not with above combination of characters; capitula homogamous or heterogamous.

24a. Receptacle paleate.

25a. Achenes with a carbonized layer in pericarp, thereby black or streaked with black ................................................................. 14. Heliantheae (p. 852)

25b. Achenes without a carbonized layer in pericarp, thereby usually not black.

26a. Phyllaries linear ................................................................. 12. Inuleae (Buphthalmum; p. 820)

26b. Phyllaries broadly elliptic to oblanceolate .............................................. 13. Athroismeae (p. 851)

24b. Receptacle epaleate.

27a. Style branches terminating in a triangular to subulate appendage distal to stigmatic lines.

28a. Phyllaries uniseriate, but sometimes with an outer series of much shorter bracts (calyculus); involucre cylindric ................................................................. 7. Senecioneae (p. 371)

28b. Phyllaries 2- to several seriate, if subuniseriate then involucre saucer-shaped to subglobose ................................................................. 8. Astereae (p. 545)

27b. Style branches without an apical appendage distal to stigmatic lines, apically rounded or truncate.

29a. Phyllaries uniseriate, but sometimes with an outer series of much smaller bracts (calyculus); capitula never aggregated into a compact synflorescence ................................................................. 7. Senecioneae (p. 371)

29b. Phyllaries 2- or 3-seriate or imbricate in several series; capitula sometimes aggregated into a compact synflorescence.

30a. Corolla bearing numerous robust uniseriate multicellular hairs ............... 246. Cavea (p. 892)

30b. Corolla without such hairs.

31a. Stigmatic papillae confined to 2 submarginal lines often confluent at apex ............................................................................... 12. Inuleae (p. 820)

31b. Stigmatic papillae covering entire adaxial surface of style branches ............................................................................... 7. Senecioneae (Doronicum; p. 371)
8. Tribe ASTEREAEE

紫苑族 zi wan zu

Chen Yilin (陈艺林 Chen Yi-ling), Chen Yousheng (陈又生); Luc Brouillet, John C. Semple

Herbs, perennial, sometimes annual or biennial, subshrubs, or shrubs, sometimes lianas [or trees]. Leaves usually alternate, simple, margin entire, serrate, dentate, or pinnatisect, rarely pinnately lobed. Capitula radiate, sometimes disciform or rarely discoid. Phyllaries many, 1–5-seriate, imbricate or ± equal, herbaceous, membranous or subleathery, margins ± narrowly scarios. Receptacles flat or convex, sometimes hemispheric or conic, or rarely cup-shaped, alveolate or smooth, epealeate or rarely paleate. Ray florets 1 to numerous, 1–(3)-seriate, female, laminate or finely subulate, lamina yellow, rarely orange or reddish to brownish, or white to pink, blue, or purple, apex sometimes 2- or 3-toothed, sometimes multiseriate, with reduced lamina or elminate, reduced to tube; disk florets bisexual or functionally male, yellow or rarely white, limb cylindric, funnelform, or campanulate; anther base obtuse, rarely cypaleate, apical appendage ovate to lanceolate; style branches with 2 adaxial stigmatic lines, apical appendages lanceolate to triangular, adaxially pilose, adaxially glabrous. Achenes cylindric, oblong, obovoid, or oblanceolate, not thickened, usually ribbed or veined. Pappus 1–4-seriate, of barbed or barbellate, rarely long-barbed, fine or coarse bristles, sometimes of setae or scales (all or outermost series), or absent.

About 225 genera and 3,100 species: worldwide, especially in temperate areas of both hemispheres; 30 genera (three endemic, two introduced) and 237 species (112 endemic, 13 introduced) in China; one additional species (Conyza stricta) is of uncertain position.

1a. Capitula disciform or discoid.

2a. Capitula globose to rounded or oblong; involucrcs patelliform or hemispheric; receptacles globose to hemispheric or obconic, often swollen, or cup- or funnel-shaped peripherally, convex centrally, rarely flat or convex (Thespis); pappus absent or coroniform, rarely of 6–13 short, coarse bristles (Thespis); herbs annual, rarely perennial.

3a. Marginal floret corolla minutely tubular or absent; pappus of 6–13 short, coarse bristles; receptacles flat or convex; leaves unlobed ........................................................................................................................................... 120. Thespis

3b. Marginal floret corolla with filiform tube and/or lamina present; pappus absent or coroniform; receptacles globose to hemispheric or obconic, often swollen, or cup- or funnel-shaped peripherally, convex centrally; leaves often lyrate lobed or lobed, sometimes unlobed.

4a. Herbs prostrate; involucres patelliform.

5a. Marginal female florets cylindric-linear, funnel-shaped, or ovoid to urceolate, 2- or 3-lobed; disk florets functionally male; synflorescences racemiform or paniculiform, rarely solitary capitula ........ 116. Dichrocephala

5b. Marginal female florets tubular, outer 2-lobed, inner 3- or 4-lobed; disk florets bisexual; synflorescences solitary capitula or laxly corymbiform .................................................................................................................. 118. Grangea

4b. Herbs erect; involucres hemispheric.

6a. Leaves pinnatifid or pinnatisect; receptacles cup-shaped or funnel-shaped peripherally (female), slightly convex centrally (disk); marginal female floret lamina none (outer) or short, narrowly funnelform (inner), 2-lobed, purple; disk florets 5-lobed; achenes oblong to ± fusiform, not ribbed ...... 117. Cyathocline

6b. Leaves sometimes lyrate, sometimes lobed, or not lobed; receptacles convex, hemispheric or globose; ray floret lamina small, rounded, ovate or linear, white to purplish; disk florets 4-lobed; achenes narrowly obovoid, 2-ribbed ........................................................................................................................... 119. Myriactis

2b. Capitula cup-shaped; involucres hemispheric or campanulate to turbinate or cylindric; receptacles flat or ± convex, or hemispheric-flattened or hemispheric-conic to lenticular-knobby; pappus of bristles (usually numerous, usually long); herbs perennial or annual, sometimes woody vines.

7a. Capitula discoid.

8a. Achenes obovoid; leaves eglandular (or sometimes stipitate glandular); capitula solitary at ends of branches, sometimes forming open paniculate-corymbiform synflorescences; disk floret lobes unequal ............... 139. Aster

8b. Achenes oblong or lanceolate; leaves gland-dotted or not; capitula in dense or loose corymbiform synflorescences, rarely solitary; disk floret lobes equal.

9a. Involucres broadly obconic to campanulate or hemispheric, phyllaries 1–3-veined; leaves sometimes 3-veined; rhizomes robust .............................................................................................................................................. 125. Galatella

9b. Involucres shortly cylindric or sometimes obconic, phyllary midvein ± distinct; leaves 1-veined; rhizomes slender ........................................................................................................................................ 126. Crinitina

7b. Capitula disciform.

10a. Woody vines, climbing; achenes angled, 3-ribbed ................................................................................ 122. Microglossa

10b. Herbs perennial or annual, climbing or erect; achenes compressed, flattened or cylindric, 2–4- or more ribbed or many veined (if 3-ribbed and angled then usually on ray only and disk achenes 2-ribbed).

11a. Capitula solitary or 2–4-fascicled at ends of branches, shortly pedunculate or sessile; disk corolla lobes unequal, outer 2 longer; herbs perennial, climbing or erect ........................................................................................................................................ 134. Heteroplexis

545
1b. Capitula radiate.

17a. Ray floret lamina yellow, orange, red, or brownish.

17b. Ray floret lamina white, pink, purple, or blue.

21a. Plants resinous; phyllaries looped or hooked; pappus of few deciduous scales or awns .................................................. 133. Formania

21b. Plants not resinous; phyllaries large, leaflike, inner membranous; pappus 3- or 4-seriate, outer few short bristles or scales, inner series of bristles, innermost sometimes ± clavate, or only short scales; leaf blade subpinnatifid or unlobed; receptacles naked.

19a. Disk florets functionally male (sterile).

20a. Capitula ± large; phyllaries unequal to equal; herbage sometimes or partly long white lanate or cottony; achenes 8–10-veined; pappus bristles long barbellate .................................................. 115. Nannoglottis

20b. Capitula medium-sized to small; phyllaries imbricate; herbage white tomentose to lanate, sessile to short-stipitate glandular; achenes 2-ribbed; pappus bristles barbellate .................................................. 135. Psychrogeton

19b. Disk florets bisexual (fertile).

21a. Plants resinous; phyllaries looped or hooked; pappus of few deciduous scales or awns .................................................. 143. Grindelia

21b. Plants not resinous; phyllaries ± appressed; pappus 1–3-seriate, outer few short bristles or scales, inner series of bristles.

22a. Capitula numerous in terminal racemiform, panicle-form, or corymbiform synflorescences; achenes oblong to cylindric, sometimes ± compressed, 8–10-veined .................................................. 140. Solidago

22b. Capitula solitary; achenes oblong, compressed, 2(−4)-veined .................................................. 141. Erigeron

1b. Capitula radiate.

11b. Capitula terminal, solitary or few, or in racemiform, paniculiform, or corymbiform synflorescences, pedunculate; disk corolla lobes equal; herbs perennial or annual, erect.

12a. Herbs annual, eglandular, glabrous (leaf margin ciliate) .................................................. 144. Symphyotrichum

12b. Herbs annual or perennial, glandular (sometimes eglandular), hairy.

13a. Involucres urceolate or subcylindric .................................................. 141. Erigeron

13b. Involucres campanulate to hemispheric-campanulate.

14a. Disk florets functionally male (sterile); phyllaries 2- or 3-seriate .................................................. 135. Psychrogeton

14b. Disk florets bisexual (fertile); phyllaries 3- or 4-seriate.

15a. Phyllaries imbricate (unequal); disk floret limb funnelform; achenes oblong, compressed.

15b. Phyllaries imbricate (unequal); disk floret limb funnelform; achenes oblong, compressed.

16a. Female florets elaminate; pappus 1-seriate; synflorescences corymbiform, sometimes glomerate, glomerate-paniculiform, or paniculiform .................................................. 121. Eschenbachia

16b. Female florets laminate, lamina short, filiform; pappus ± 2-seriate, outer very short, slender; synflorescences densely compound-corymbiform (see species incertae sedis after Eschenbachia) .................................................. Conyza stricta
30a. Subshrubs, strongly branched; leaf margins often revolute; phyllaries leathery .......................... 127. *Asterothamnus*
30b. Herbs perennial, biennial, or annual; leaf margins flat (rarely revolute); phyllaries membranous or leaflike.

31a. Pappus conspicuously elongating after anthesis; herbs annual ......................................................... 124. *Tripolium*
31b. Pappus not elongating after anthesis; herbs perennial, sometimes annual or biennial.

32a. Leaves basal, linear; achenes slightly veined, densely sericeous, eglandular; capitula solitary ................................................................. 128. *Arctogeron*
32b. Leaves basal and cauline (sometimes reduced, then basal not linear); achenes ribbed or veined, glabrous or sparsely to densely strigillose, glandular or eglandular; capitula in synflorescences or solitary.

33a. Achenes 7–10-veined; stems ascending, villous, eglandular ......................................................... 142. *Eurybia*
33b. Achenes 2–6-ribbed or -veined; stems usually erect, sometimes prostrate, glabrous or hairy, glandular or eglandular.

34a. Disk corollas ± zygomorphic (1 lobe deeper).
34b. Disk corollas actinomorphic.

35a. Herbs perennial, caespitose; basal leaves numerous (persistent); receptacle shallowly alveolate, naked ........................................................................ 138. *Rhinactinidia*
35b. Herbs perennial, biennial, or annual, not caespitose, or rarely shrubs; basal leaves withered by anthesis; receptacle alveolate, fimbriate ................................................................. 139. *Aster*

36a. Capitula small, numerous in dense corymbiform synflorescences; stems densely glandular; disk corolla limb shortly funnelform; achenes ovoid ................................... 129. *Turczaninovia*
36b. Capitula small or medium-sized, solitary or few to numerous in corymbiform, racemiform, or paniculiform synflorescences; stems ± glandular or eglandular; disk corolla limb cylindric to funnelform or campanulate; achenes oblong or obovoid to oblancoeloid.

37a. Disk floret limb cylindric to narrowly funnelform; phyllary midvein reddish or orange ................................................................. 141. *Erigeron*
37b. Disk floret limb campanulate to funnelform; phyllary midvein not reddish or orange.

38a. Herbs perennial, sometimes annual, biennial, or shrubs, glandular or eglandular, glabrous or hairy; involucre hemispheric to campanulate, sometimes obconic; capitula solitary or in corymbiform, sometimes paniculiform synflorescences; achenes oblong or obovoid, compressed, 2–4(-7)-ribbed, glandular or eglandular .......... 139. *Aster*
38b. Herbs perennial or annual, eglandular, glabrous (except distally in lines); involucres campanulate or cylindric; capitula in paniculiform synflorescences; achenes oblancoeloid, ± compressed, 2–6-veined, eglandular ................................................................. 144. *Symphyotrichum*


毛冠菊属  mao guan ju shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

*Stereosanthus* Franchet; *Vierhapperia* Handel-Mazzetti.

Herbs, perennial, rarely subshrubs; rhizome woody; herbage sometimes or partly long white lanate or cottony, stipitate glandular. Leaves alternate, basal and lower cauline long or shortly petiolate, blade lanceolate, ovate-lanceolate, oblong, orbicular, or cordate, margin coarsely serrate, mid and upper cauline sessile, often decurrent. Capitula ± large, few to numerous in corymbiform synflorescences, rarely solitary, radicate. Involucre hemispheric or cup-shaped; phyllaries 2–4-seriate, unequal to equal, herbaceous, rarely papery, multiveined, margins of inner narrowly scarious, outer glandular or long hairy. Receptacles flat or slightly convex, ± alveolate, naked. Ray florets outer with lamina yellow, reddish, or brownish, surpassing or ± equaling phyllaries, inner 2- or 3-seriate, rarely few or absent, tubular, elaminate, shorter than styles; disk functionally male, yellow, narrowly funnelform, 5-lobed, lobes lanceolate to linear-lanceolate, often glandular; anther bases obtuse or acute; style branches of ray florets linear-lanceolate, long, of disk ± appressed together, lanceolate, ± short, densely hairy (outer), without receptive papillae. Achenes brown, oblong, sparsely strigose, pale 8–10-veined. Pappus of few short, thin bristles (sometimes absent), and many long, coarse or thin, long-barbellate bristles, those of disk sometimes few, short, thin.

Nine species: Bhutan, China, India, Nepal; nine species (six endemic) in China.

J. Q. Liu et al. (Molec. Phylogen. Evol. 23: 307–325. 2002) produced a molecular phylogeny of *Nannoglottis*, showing it is one of the earliest diverging lineages of Astereae. *Nannoglottis ravida* is the earliest diverging member of the genus and has been segregated under *N.* sect. *Monocephala* T. G. Gao & Y. L. Chen from all other species of the genus.
1a. Subshrubs; capitula solitary; ray florets yellow; leaves abaxially densely cottony .................................................. 1. N. ravida

1b. Perennial herbs; capitula numerous in corymbiform synflorescences; ray florets yellow, brownish, or reddish; leaves abaxially ± densely cottony or arachnoid, or glandular.

2a. Ray florets brownish or reddish, lamina slightly exceeding involucre.

3a. Basal leaves cordate, long winged petiolate ........................................................................................................... 9. N. yunnanensis

3b. Basal leaves ovate-lanceolate, attenuate at base.

4a. Mid cauline leaves base abruptly narrowed into short, broadly winged petiole, margin denticulate, abaxially stipitate glandular ................................................................. 8. N. hieraciophylla

4b. Mid cauline leaves base attenuate, margin dentate, abaxially stipitate glandular, sparsely arachnoid ................................................................. 7. N. carpesioides

2b. Ray florets yellow, lamina distinctly exceeding involucre.

5a. Basal leaves abaxially densely lanate (glands not visible), sometimes arachnoid.

6a. Basal leaves long petiolate, cordate to orbicular or broadly ovate, margin shallowly dentate, teeth obtuse or acute, mid cauline abruptly smaller; phyllaries lanceolate ................................................................. 2. N. delavayi

6b. Basal leaves shortly petiolate, ovate to lanceolate, margin irregularly denticulate to dentate, mid cauline developed; phyllaries ovate to lanceolate-ovate ................................................................. 5. N. latiscuama

5b. Basal leaves abaxially glandular or also arachnoid.

7a. Phyllaries papery, 3- or 4-seriate, unequal, outer shorter than inner .................................................................. 3. N. gynura

7b. Phyllaries herbaceous, 2- or 3-seriate, equal or subequal.

8a. Basal leaves attenuate at base, decurrent on stem, usually sessile ................................................................. 4. N. hookeri

8b. Basal leaves abruptly narrowed, long petiolate .................................................................................................. 6. N. macrocarpa


2a. Ray florets brownish or reddish, lamina slightly exceeding involucre.

3a. Basal leaves cordate, long winged petiolate ........................................................................................................... 9. N. yunnanensis

3b. Basal leaves ovate-lanceolate, attenuate at base.

4a. Mid cauline leaves base abruptly narrowed into short, broadly winged petiole, margin denticulate, abaxially stipitate glandular ................................................................. 8. N. hieraciophylla

4b. Mid cauline leaves base attenuate, margin dentate, abaxially stipitate glandular, sparsely arachnoid ................................................................. 7. N. carpesioides

2b. Ray florets yellow, lamina distinctly exceeding involucre.

5a. Basal leaves abaxially densely lanate (glands not visible), sometimes arachnoid.

6a. Basal leaves long petiolate, cordate to orbicular or broadly ovate, margin shallowly dentate, teeth obtuse or acute, mid cauline abruptly smaller; phyllaries lanceolate ................................................................. 2. N. delavayi

6b. Basal leaves shortly petiolate, ovate to lanceolate, margin irregularly denticulate to dentate, mid cauline developed; phyllaries ovate to lanceolate-ovate ................................................................. 5. N. latiscuama

5b. Basal leaves abaxially glandular or also arachnoid.

7a. Phyllaries papery, 3- or 4-seriate, unequal, outer shorter than inner .................................................................. 3. N. gynura

7b. Phyllaries herbaceous, 2- or 3-seriate, equal or subequal.

8a. Basal leaves attenuate at base, decurrent on stem, usually sessile ................................................................. 4. N. hookeri

8b. Basal leaves abruptly narrowed, long petiolate .................................................................................................. 6. N. macrocarpa


late, base auriculate-clasping; upper cauline reduced upward, entire. Capitula (5–)10–27 in corymbiform synflorescences. Involucre 2–3.5 mm in diam.; phyllaries 3- or 4-seriate, linear-lanceolate, unequal, outer shorter than inner, papery, surfaces densely short-stipitate glandular, ± arachnoid, margin apically densely arachnoid ciliate, that of inner narrowly to moderately scarious, apex acuminate to ciliate, tip often dark. Ray florets yellow, lamina narrowly oblong, 9–13 × 1.8–2.5 mm, distinctly exceeding involucre; inner tubular 2- or 3-seriate, yellow, 2–4 mm, obliquely truncate; disk florets numerous, 4–4.5 mm, lobes glandular (mostly at apex). Achenes brown, narrowly oblong, 4–6 mm, sparsely to moderately strigose, particularly distally, pale 8–10-veined. Pappus of white or whitish bristles 4–5.5 mm, those of disk fewer. Fl. Jul.–Aug.

*Pinus* or *Picea* forests, thickets, gullies, grasslands on slopes; 3400–4000 m. Qinghai, Sichuan, Xizang, Yunnan [Nepal].


虎克毛冠菊 hu ke mao guan ju


Herbs, perennial; rhizome woody. Stems erect, 10–85 cm tall, simple, often weakly lanate at first, stipitate glandular above. Leaves sessile or lowest winged petiolate, petiole to ca. 10 cm, blade lanceolate to oblanceolate, 7–22 × 1–8 cm, surfaces lanate or glabrescent, stipitate glandular, base attenuate, decurrent on stem, margin denticulate to sharply toothed, apex acute. Capitula 2–7 in corymbiform-cymose synflorescences. Involucre ± hemispheric, 15–20 mm in diam.; phyllaries 2- or 3-seriate, subequal, lanceolate, 10–15 × 1–4 mm, sparsely arachnoid and stipitate glandular, apex acuminate. Ray florets yellow, tube 2.3–4.5 mm, hairy above, lamina 8–13 × 1.7–3.3 mm, distinctly exceeding involucre; inner tubular 1- or 2-seriate, 2–3.5 mm, puberulent above; disk florets yellow, funnelform, 4–4.5 mm, lobes sparsely glandular. Achenes oblong, 4.5–5 mm, strigose distally. Pappus of white or brownish bristles 4–5 mm. Fl. Jun.–Aug.

*Pinus* forests, sometimes among shrubs; 3400–4100 m. S Xizang (Yadong) [Bhutan, India (Sikkim), Nepal].


宽苞毛冠菊 kuan bao mao guan ju


Herbs, perennial; rhizome thick. Stems solitary, erect, 12–70 cm, simple, ± densely white arachnoid and villous, long-stipitate glandular (notably above), partly glabrescent. Leaves: basal and lower cauline petiole short, winged, blade ovate to lanceolate, sometimes obovate to oblanceolate, 4–20 × 3–17 cm, abaxially densely lanate to arachnoid, adaxially arachnoid, short-stipitate glandular, base attenuate, decurrent on stem, margin irregularly denticulate to dentate, apex obtuse or rounded, mucronate; mid cauline several, oblong, lanceolate, or ovate, sometimes obovate, apex obtuse or acute; upper cauline gradually reduced, surfaces white arachnoid-lanate or arachnoid, abaxially more densely so, adaxially ± glabrescent. Capitula (1 or)2–14, in corymbiform synflorescences, rarely solitary. Involucre hemispheric, 1.5–3.5 cm; phyllaries 3- or 4-seriate, subequal, herbaceous (inner papery), ovate to lanceolate-ovate, 13–18 × 2–5 mm, sometimes sparsely to densely white arachnoid, densely stipitate glandular, margin villous, long-stipitate glandular, distally moderately arachnoid ciliate, apex long acuminate. Ray florets yellow, oblong, 9–18 × 2–4 mm, distinctly exceeding involucre; inner tubular 2- or 3-seriate, 1.8–3.5 mm, truncate; disk florets yellow, tubular, 4–5.3 mm, lobes glabrous. Achenes oblong, 4.4–5.5 mm, moderately strigose, 10-ribbed (sterile disk ovary glabrous or sparsely strigose distally). Pappus of straw-colored, coarse bristles 4–5 mm, plus some short, thin bristles, those of disk lacking or few and thin. Fl. Apr.–Sep.

● *Pinus, Abies*, or mixed forests, thickets, grasslands, alpine meadows; 3200–3900 m. S and W Sichuan, NW Yunnan.


大果毛冠菊 da guo mao guan ju

Herbs, perennial; rhizome ascending, woody. Stems erect, 30–100 cm tall, white lanate and sparsely villous, long-stipitate glandular. Leaves: basal long petiolate, blade ovate to ovate-lanceolate, 6–25 × 3–11 cm, abaxially stipitate glandular, adaxially sparsely arachnoid, very sparsely villous, stipitate glandular, margin coarsely dentate, apex obtuse; cauline sessile, lower ovate or elliptic, 15–20 × 8–18 cm, apex obtuse to acute; mid cauline up to 25, elliptic, 8–10 cm, base decurrent, apex acute; upper cauline ovate to ovate-lanceolate, base cordate, auriculate-clasping, apex acuminate. Capitula 3–20, in corymbiform-cymose synflorescences. Involucre hemispheric, 2–2.5 cm in diam.; phyllaries 2- or 3-seriate, subequal or outer slightly longer, lanceolate to linear-lanceolate, ca. 12 × 2–2.5 mm, herbaceous, abaxially short-stipitate glandular, margin apically lanate-ciliate. Ray florets yellow, lamina 6–8 × 0.6–1.3 mm, distinctly exceeding involucre; inner tubular 1- or 2-seriate, yellow; disk florets yellow, funnelform, 4–4.5 mm, lobes ca. 1.5 mm, short-stipitate glandular outside. Achenes oblong, 6–7 mm, ± densely strigose, 10–12-ribbed. Pappus of white to yellowish, coarse, unequal bristles 4–5 mm. Fl. Jul.–Aug.

Forests, grasslands; 3500–3700 m. E Xizang (Bomi, Qamdo) [Nepal].


毛冠菊 mao guan ju

Herbs, perennial; rhizome woody. Stems erect, 60–100 cm tall, sparsely arachnoid-tomentose, long-stipitate glandular, more densely so above. Leaves: basal and lower cauline dense, petiole to 10 cm, winged, blade oblone or obovate-oblanceolate, 10–33 × 6–16 cm, abaxially sparsely arachnoid, stipitate glandular, veins long villous to arachnoid, adaxially stipitate glandular, sparsely arachnoid or not, base attenuate, often decurrent on stem, margin coarsely dentate to serrate, apex acuminate; mid cauline ovate to ovate-lanceolate, abaxially stipitate
glandular, sparsely arachnoid, base attenuate, margin coarsely dentate; upper cauleine reduced gradually, finely dentate. Capitula 3–12 in loose racemiform or corymbiform synflorescences. Involucre hemispheric, 1.5–2.5 cm in diam.; phyllaries 2–3-seriate, subequal or outer slightly longer, lanceolate to oblong-lanceolate, 9–12 mm, papery, ± densely stipitate glandular, sometimes base sparsely arachnoid, margin stipitate glandular, of inner narrowly scarious, apex acute to acuminate. Ray florets brownish, lamina oblong, 1.9–4 × 1–1.7 mm, slightly exceeding involucre, abaxially sparsely stipitate glandular; inner tubular 1–2-seriate; disk florets yellowish, tubular, lobes glandular at apex. Achenes oblong, 4.5–5 mm, strigose, 8–10-ribbed. Pappus of dirty white, coarse bristles, those of disk few, short. Fl. Jun–Jul.

- Forests on slopes, meadows, pastures; 2000–3400 m. Gansu, Qinghai, Shaanxi, Yunnan.


玉龙毛冠菊 yu long mao guan ju


Herbs, perennial; rhizome woody. Stems erect, 38–90 cm tall. Leaves: basal short, winged petiole, blade ovate or oblong, 12–24 × 3.8–9 cm, abaxially stipitate glandular, base attenuate, margin dentate, villosulous; mid cauleine broadly winged, shortly petiole, blade abaxially stipitate glandular, sparsely villous on midvein, adaxially densely short-stipitate glandular, sparsely villosulous, base abruptly narrowed, margin denticulate; upper cauleine sessile. Capitula 2–7, in corymbose synflorescences. Phyllaries 2–4-seriate, subequal, linear-lanceolate. Ray florets purplish-reddish, lamina 0.6–4 × 0.4–1.2 mm; inner tubular 1-seriate, filiform, sometimes unstable; disk florets numerous, yellowish, 4–5 mm, lobes glandular at apex. Achenes oblong, pilose, 8–10-ribbed. Pappus of few white bristles 3–4 mm. Fl. Jun–Sep.


云南毛冠菊 yun nan mao guan ju


Herbs, perennial; rhizome thick, woody. Stems erect, solitary, 55–200 cm tall, white long villous below, sparsely to moderately (more densely under capitula) white arachnoid, densely long-stipitate glandular above. Leaves: basal long petiolate, withered and fallen at anthesis, blade cordate; lower cauleine petiole 6–16 cm, broadly winged, blade subcordate, broadly ovate, ovate, or subelliptic, 9.25 × 4.5–18 cm, abaxially arachnoid, sessile glandular or short-stipitate glandular, adaxially scaberulous to glabrate, base broadly cuneate, truncate, or slightly cordate, decurrent on stem, margin irregularly dentate, apex obtuse, rounded, or acute, mucronulate; upper cauleine gradually diminished, uppermost sessile, auriculate. Capitula 3–10 in corymbose-cymose synflorescences. Involucre hemispheric, 1.7–2.5 cm in diam.; phyllaries 2–3-seriate, subequal, lanceolate or linear-lanceolate, 8.13–1.5–2 mm, abaxially densely short-stipitate glandular, sparsely arachnoid at base, margin arachnoid ciliate (more densely so apically), of inner narrowly scarious, apex acuminate. Ray florets brownish, lamina linear-lanceolate to triangular, 0.5–3 mm, slightly exceeding involucre, gradually reduced inward to inner tubular florets; inner tubular 2–4-seriate, 1–2 mm, obliquely truncate; disk florets numerous, yellowish, 2–5 mm, deeply lobed, lobes sparsely glandular. Achenes straw-colored, narrowly oblong, 3–4 mm, strigose, 8–10-ribbed. Pappus of disk florets glabrous or sparsely stipitate apically. Pappus of straw-colored bristles 3–4 mm, those of disk few, unequal. Fl. Jun–Jul.

- Picea forests, open pastures; 2900–4000 m. W Sichuan, NW Yunnan (Zhongdian).


鱼眼草属 yu yan cao shu

Chen Yilin (陈艺林); Luc Brouillet

Herbs, annual, prostrate. Leaves alternate, lyrate or entire. Capitula small, disciform, orbicular or oblong, in racemiform or paniculiform synflorescences, rarely solitary. Involucre patelliform; phyllaries 2–3-seriate, margins narrowly scarious, filaminate. Receptacle globose or obconic, swollen, alveolate, naked. Florets fertile; marginal female many seriate, white or yellow, without tube, lamina narrowly cylindric, funnel-shaped, campanulate, or ovoid to urceolate, 2–3-lobed; disk florets bisexual, yellow or reddish, tube short, limb narrowly campanulate, 4–5-lobed; anther base obtuse; style branch tips lanceolate. Achenes obovoid, compressed, glabrous, sometimes basally and apically glandular, green apically, margins strongly 2-ribbed, of female florets sometimes faintly so. Pappus absent, of disk florets ± coroniform, sometimes with 1 or 2 short setae.

Four species: Africa, tropical Asia; three species in China.

1a. Corolla of female florets shortly funnel-shaped or campanulate; phyllaries ± puberulent; receptacle distinctly swollen, obconic, apex acute .................................................. 1. D. chrysanthemifolia

1b. Corolla of female florets cylindric or ovoid to urceolate; phyllaries glabrous; receptacle globose, apex flat.

2a. Female floret corolla narrowly cylindric; leaves lyrately pinnatifid, base attenuate into winged petiole ... 2. D. integrifolia

2b. Female floret corolla ovoid or urceolate; leaves usually pinnate, rarely lyrate pinnatifid, base expanded, auriculate-clasping, sessile .......................................................................................................................... 3. D. benthamii

菊叶鱼眼草  jì yè yú yàn cǎo

*Cotula chrysanthemifolia* Blume, Bijdr. 918. 1826; *Dichrocephala abyssinica* Schultz Bipontinus ex Hochstetter; *D. grangeifolia* Candolle.

Herbs, annual, branched. Stems and branches rigid, white tomentulose, pubescent, or hirsutulous, long-stipitate glandular, branches ascending, spreading or apically oblique. Leaves oblong or obovate, 3–5 × 0.8–2 cm, pinnatifid, pinnatisparte, or pinnatilobate, surfaces densely white strigose and puberulent, sparsely glandular, base expanded, auriculate-clasping; lateral lobes 2- or 3-paired, obovate, lanceolate, or triangular-lanceolate, margin 1- or 2-serrulate on one or both sides, or entire; lobes of lower leaves relatively small, of middle large, of upper gradually smaller, uppermost linear, entire or with 1- or 2-paired teeth. Capitula globose or oblong, ca. 7 mm in diam., solitary in upper leaf axil and in subcrambescence synflorescences; peduncles ca. 5 cm, densely puberulent or puberulent-tomentose; bracts 1–3, linear or lanceolate. Phyllaries 1- or 2-seriate, slightly unequal, ca. 1.5 mm, margin white scarious, ± puberulent. Receptacles obconic, distinctly swollen, 5–6 mm in fruit, apex acute. Marginal female florets many seriate, purple, corolla narrowly campanulate to funnelform, 4- or 5-lobed. Achenes straw-colored, obovoid, compressed, glabrous, sparsely glandular apiically and/or basally. Pappus absent, or of disk florets sometimes with 1 or 2 bristles. Fl. and fr. year-round.

Grasslands on slopes, roadsides; ca. 2900 m. Xizang, Yunnan [Bhutan, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, New Guinea, Philippines, Thailand, Vietnam; tropical Africa, SW Asia (Iran); introduced in SW Asia (Azerbaijan, Georgia, Turkey), Australia, and Pacific islands].

This is a medicinal plant, used for dyspepsia, indigestion, as an antiphlogistic, and as an antiemetic.

3. Dichrocephala benthamii C. B. Clarke, Compos. Ind. 36. 1876.

小鱼眼草  xiǎo yú yàn cǎo

*Dichrocephala amphiloba* H. Léveillé & Vaniot; *D. bodinieri* Vaniot.

Herbs, annual, 6.5–35 cm tall. Stems solitary or fascicled, robust, rarely slender, branched, sparsely to densely white villous or pubescent. Leaves sessile, blade ovate, obvolute-oblong-spatulate, or oblong, surfaces sparsely villous, sometimes glabrescent or glabrate, veins densely villous-ciliolate; mid cauline 3–6 × 1.5–3 cm, pinnate, rarely lyrate-pinnatilobate, sometimes unlobed, lateral lobes 1–3-paired, spatulate or broadly spatulate, base auriculate-clasping, margin coarsely crenate-serrate, densely or sparsely white shortly hairy. Capitula globose, 3–5 mm in diam., few or numerous in lax to dense corymbiform or paniculate-corymbiform synflorescences; peduncles slightly robust, puberulent or glabrate. Phyllaries 2- or 3-seriate, oblong, 1–1.5 mm, margin denticulate. Receptacle globose, apex flat. Marginal female florets many seriate, white, sometimes turning purplish, corolla narrowly cylindric, 0.4–0.5 mm, usually 2-lobed; disk florets few, ca. 0.5 mm, tube short, limb narrowly campanulate to funnelform, 4- or 5-lobed, sessile glandular. Achenes straw-colored, obovate, compressed, glabrous, sparsely glandular apiically and/or basally. Pappus absent, or of disk florets sometimes with 1 or 2 bristles. Fl. and fr. year-round.

Grasslands in valleys, riverbanks, fields, wastelands, roadsides; 700–3200 m. Gansu, Guangxi, Guizhou, Hubei, Sichuan, Xizang, Yunnan [Bhutan, Cambodia, India, Laos, Nepal, Vietnam].
paniculiform or nearly racemiform synflorescences. Receptacles cup-shaped or funnel-shaped peripherally (bearing marginal florets), slightly convex centrally (bearing disk florets), non-alveolate, naked. Involucre hemispheric; phyllaries 2- or 3-seriate, subequal, oblong to lanceolate, margin scarious. Marginal florets female, fertile, many seriate, purple, tube filiform, lamina none (outer) to short, narrowly funnelform (inner), 2-lobed; disk florets bisexual, usually functionally male, few, limb funnelform, 5-lobed; anther base truncate, appendages triangular; style branch tips linear-lanceolate, of disk florets simple or cleft. Achenes minute, oblong to ± fusiform, slightly flattened, not ribbed, apex ± coroniform. Pappus absent.

Three species: tropical Asia; one species in China.


杯菊 bei ju

Tanacetum purpureum Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 181. 1825; Cyathocline lyrae Cassini; C. stricta Candolle; Dichrocephala minutifolia Vaniot.

Herbs, annual, 10–36+ cm tall. Stems erect, often branched from base, branches ascending, reddish purple or red tinged, villous, short-stipitate glandular, more densely so upward. Leaves: basal and lower cauline often deciduous by flowering, petiolate; mid cauline sessile, blade ovate or obovate, 2.5–12 cm, reduced distally, pinnatisect or pinnatifid, abaxially sparsely villous particularly along midvein, stipitate glandular, adaxially sparsely villous or glabrate, sparsely glandular, base expanded auriculate-clasping, segments opposite or oblique, interspersed with triangular lobes along rachis, larger and terminal segments ± lobed, margin spinose-serrate, ± stipitate glandular. Capitula small, numerous or few in often dense terminal corymbiform or corymbiform-paniculiform synflorescences; peduncles densely white villous, ± densely stipitate glandular. Involucre hemispheric, ca. 2 mm in diam.; phyllaries 2- or 3-seriate, subequal, membranous, abaxially sparsely white villous or glabrous, sometimes sparsely glandular (mostly distally), margin hyaline, scarious, ± fimbriate, ciliate, apex acuminate, purple. Marginal female florets purple, tube filiform and short, limb narrowly funnelform, 2-lobed; disk florets 7–11, purple or lobes purple, tube cylindric, 0.6–0.8 mm, limb funnelform, ca. 1.6 mm, lobes triangular. Achenes oblong to fusiform. Fl. and fr. nearly year-round.

Forests, grasslands on slopes, ravines, watersides, roadsides, fields; 100–2000 m. Guangdong, Guangxi, Guizhou, Sichuan, Yunnan [Bangladesh, Bhutan, Cambodia, India, Laos, Myanmar, Nepal, Thailand, Vietnam].

### 118. **GRANGEA** Adanson, Fam. Pl. 2: 121. 1763.

田基黄属 tian ji huang shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Herbs, annual [or perennial], often prostrate. Leaves alternate, oblong-obovate to spatulate, lyrate-pinnatifid or serrate-dentate. Capitula disciform, globose, solitary or in laxly corymbiform synflorescences. Involucre patelliform; phyllaries 2- or 3-seriate, slightly unequal, herbaceous, inner series scarious at apex. Receptacle swollen, hemispheric or obconic, naked. Florets yellow. Marginal florets female, 1- to many seriate, corolla tubular, of outer usually 2-lobed, of inner 3- or 4-lobed; disk florets bisexual, fertile, limb narrowly campanulate, 4- or 5-lobed; anther base obtuse, apical appendage lanceolate; style branches truncate, obtuse or with triangular appendage, sometimes simple. Achenes compressed or subcylindric, apex truncate, often ringed. Pappus absent.

Nine species: tropical and subtropical Africa and Asia; one species in China.

1. **Grangea maderaspatana** (Linnaeus) Poiret, Encycl. Suppl. 2: 825. 1812.

田基黄 tian ji huang

Artemisia maderaspatana Linnaeus, Sp. Pl. 2: 849. 1753; Cotula sphaeranthus Link; Grangea procumbens Candolle; G sphaeranthus (Link) K. Koch.

Herbs, annual, (5–)10–30 cm tall. Stems slender, usually procumbent, branched, white villous or glabrescent in lower part by anthesis. Leaves usually obovate, obovate, or oblanceolate, 3.5–7.5 × 1.5–2.5 cm, surfaces white villous, glandular; basal sessile, blade pandurate or lyrate-lobate, to ca. 10 × 4 cm, base usually auriculate, terminal lobe obovate or suborbicular, margin coarsely dentate, lateral lobes 2–5-paired; upper gradually smaller. Capitula terminal, solitary, rarely paired, 8–10 mm in diam. Involucre hemispheric; phyllaries 2- or 3-seriate, outer series lanceolate-ovate, 4–8 mm, outer surface vil- lous, margin fimbriate, ciliate, apex acute to obtuse, inner series obovate or obovate, clawed, obtuse. Receptacles hemispheric. Florets densely glabrous; marginal female florets yellow, 2–6-seriate, corolla filiform, ca. 1 mm, shortly 2- or 4-lobed; disk florets shortly cylindric campanulate, ca. 1.5 mm, lobes ovate. Achenes compressed, glabrous, glandular, ± thickly 2-rilled, apex truncate, with a thickened, toothed ring. Pappus absent. Fl. and fr. Jan–Aug.

Riverbanks, watersides, rice paddies, sandy areas, meadows, open forests, thickets; below 100–1000 m. Guangdong, Guangxi, Hainan, Taiwan, S Yunnan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam; tropical Africa].

The leaves are used medicinally as a stomachic, an antitussive, and for regulating menses.
119. **Myriactis** Lessing, Linnaea 6: 127. 1831.

Herbs, annual or perennial, herbage villous, long-stipitate glandular. Leaves alternate, basal and/or cauline, winged petiolate or sessile, blade oblong to oblanceolate-oblong to spatulate, sometimes lyrate, sometimes lobed, base claspings, margin ± coarsely dentate or serrate. Capitula small, heterogamous, solitary or numerous in lax corymbose-paniculiform synflorescences; peduncle long. Involucre hemispheric; phyllaries 2- or 3-seriate, subequal, papery, margin scarious, hyaline, ± fimbriate. Receptacles convex, hemispheric or globose, not alveolate, naked. Ray florets fertile, 2–5- or more seriate, tube short, lamina white to purplish, small, orbicular, ovate, or linear; disk florets functionally male, limb narrowly funnelform to campanulate, 4-lobed, lobes lanceolate; anther base obtuse; (disk) style branches appressed, without stigmatic lines, appendages lanceolate, abaxially hairy. Achenes narrowly obovoid, compressed, margin 2-ribbed, apex with short viscid collar (of ray florets), glabrous, ± glandular. Pappus absent.

About 12–16 species: tropical Africa and Asia; five species (one endemic) in China.


**Dichrocephala leveillei** Vaniot.

Herbs, perennial, usually robust, 15–100 cm tall; rhizomes short, procumbent. Stems erect, often branched from middle or base, branches ascending, glabrous or sparsely villous. Leaves: basal and lower cauline winged petiolar, petiole to 10 cm, blade simple, large, ovate-elliptic, sometimes lobed or parted, lateral lobes 1- or 2-or 3-paired, petiole base sheathing; mid cauline elliptic to ovate, 4–10 × 2.5–4.5 cm, margin coarsely serrate or crenate, base decurrent into broad, winged petioles (lower) or sessile (upper), petiole base or blade base ± auriculate-clasping; upper gradually smaller, sessile, elliptic, oblong-obovate, or lanceolate, surfaces sparsely villosulous particularly on veins, more moderately so adaxially, base ± auriculate-clasping. Capitula globose or hemispheric, 0.7–1.5 cm in diam., solitary or numerous in lax corymbose-paniculiform synflorescences. Phyllaries 2- or 3-seriate, lanceolate, abaxially villosulous. Ray florets 8- or more seriate, lamina orbicular or ovate, 0.6–0.8 mm, apex rounded or emarginate; disk floret limb broadly funnelform, 1.2–1.3 mm, villosulous, 4-lobed. Achenes straw-colored, 1.6–2.1 mm, faces sometimes 1-veined, apical collar viscid, dark. Fl. and fr. Apr–Nov.

Forests, forest margins, thick margins, slopes, wet areas on grassy-shrubby disturbed slopes, steep moist slopes, meadows, open and moist or humid areas along streambeds, ravines, roadsides; 700–3700 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Xizang, Yunnan [Blutan, India, Myanmar, Nepal, Pakistan, Vietnam].


**Myriactis bipinnatisecta** Kitamura; *M. formosana* Kita- mura; *M. humilis* var. *bipinnatisecta* (Kitamura) S. S. Ying; *M. longipedunculata* Hayata; *M. longipedunculata* var. *bipinnatisecta* (Kitamura) Kitamura; *M. longipedunculata* var. *formosana* (Kitamura) Kitamura.

Herbs, perennial, 10–35 cm tall; rhizomes short, oblique. Stems solitary or to 3, erect, branched, branches ascending, or simple, scapiform, glabrous or ± puberulent. Leaves usually crowded in lower part (basal and lower cauline), petiole 2.5–4 cm, winged, blade elliptic, spatulate, or ovate, 2–3(–7) × 1–2(–4) cm, lyrate-pinnatifid, pinnatifid, or lyrate-bipinnatisect, or simple and ± orbicular to spatulate, surfaces sparsely to moderately strigose to glabrate, base auriculate-clasping, lateral lobes 2- or 3-paired, oblong to ovate or obovate, margin entire or 1-serrate on one side, terminal lobe large, broadly ovate to orbicular or oblong, margin coarsely serrate or lobed-serrate; upper cauline few, winged petiolar, blade oblong-obovate or obovate, pinnatifid, base auriculate-clasping, terminal lobe obtriangular or lanceolate; uppermost sessile, simple, blade narrowly oblong, entire or few toothed. Capitula hemispheric, 6–9 mm in diam., few (usually 3 or 4), solitary at ends of stems and branches or in open paniculate-corymbiform synflorescences; peduncle 1–12 cm. Phyllaries 2-seriate, subequal, oblong or narrowly oblong with narrow scarious margin, outer series pulmonary-puberulent. Ray florets 8- or more seriate, tube and abaxial lamina hairy, lamina orbicular, apex emarginate or rounded; disk florets funnelform, 1–1.4 mm, limb base hairy, 4-lobed. Achenes brown, 1.6–2 mm, glabrous. Fl. and fr. May–Oct.

- Moist and humid places on shady slopes, roadsides; 1700–3000 m. Taiwan.


**粘冠草** nian guan cao

- Moist and humid places on shady slopes, roadsides; 1700–3000 m. Taiwan.

**粘冠草** nian guan cao
Myriactis javanica Candolle; M. wightii var. cordata Y. Ling & C. Shih.

Herbs, annual, 20–90 cm tall. Stems erect, usually branched from middle, rarely proximally, or simple, subscapose, branches ascending or spreading, densely to sparsely villous or glabrate in lower part. Leaves often with axillary branches or fascicled; lower blade ovate, or sometimes lyrate-pinnatifid, terminal lobe ovate; mid cauline petiole broadly winged, blade broadly to narrowly ovate, 5–8 × 3–6 cm, rarely lyrate-pinnatifid, terminal lobe same shape as blade, surfaces villous to strioso-villous or villous only along veins, base clasping or auriculate-clasping, margin deeply crenate or serrate or incised-serrate, entire in uppermost leaves or lateral lobes. Capitula few or numerous in terminal, laxly corymbose or paniculate-corymbose and lateral, laxly racemiform synflorescences; peduncle 0.4–5 cm. Involucre hemispheric, ca. 1.2 cm in diam. (in fruit); phyllaries 2(or 3)-seriate, subequal, narrowly oblanceolate, 8–12 × 0.4–0.7 mm, 5-lobed, lobes 1- or 2-paired, terminal lobe large, elliptic or long elliptic to ovate, margin serrate (often entire on lobes), mucronulate; upper blade narrowly oblong-obovate or narrowly elliptic to (uppermost) linear, pinnatifid or pinnatilobate, to (uppermost) serrate or entire. Capitula hemispheric, 6–8 mm in diam. (in fruit), few in lax racemiform synflorescences (terminal seeming subcorymbose). Phyllaries 3-seriate, subequal, lanceolate or oblong or oblongate to oblanceolate (inner), 3–4 mm, outer externally strigillose. Ray florets 2- or 3-seriate, tube 0.7–0.8 mm, glandular, lancilobate or oblong to oblanceolate (inner), 3–4 mm, outer externally strigillose. Ray florets 2- or 3-seriate, tube 0.2–0.3 mm, limb campanulate, 1.1–1.3 mm, upper tube and limb base glandular, 4(or 5)-lobed, lobes lanceolate, 0.75–0.8 mm. Achenes olive to pale brown, 1.5–2.5 mm. Fl. and fr. Jul.–Nov.

Forests on slopes, mixed forests, grasslands, streamsides; 1900–3600 m. Guizhou, Sichuan, Yixian, Yunnan [India, Indonesia, Nepal, Sri Lanka, Vietnam].

Myriactis wightii var. cordata (FRPS 74: 355. 1985), defined on the basis of mid cauline leaf bases, does not appear to warrant recognition.


狐利草 hu li cao

Herbs, annual, 15–60 cm tall. Stems erect, often many branched from base or middle, branches ascending, spreading, long, white strigillose, sparsely villosulous, or glabrate. Leaves: petiole narrowly winged, base slightly expanded or auriculate-clasping, blade surfaces sparsely white strigiloose, sometimes glabrate, base abruptly attenuate to rounded, margin serrate, repand-dentate, or entire; mid cauline blade narrowly elliptic-lanceolate or narrowly elliptic, 4–4.6 × 2–3 cm, uppermost similar or sublinear. Capitula hemispheric, ca. 1 cm in diam. (in fruit), numerous in laxly corymbose or subcorymbose synflorescences, those of lower branches in paniculate-corymbose or racemiform synflorescences; peduncle short and slender. Phyllaries 2-seriate, subequal, oblong or oblaneolate, 3–4 mm, sometimes sparsely pubescent at base. Ray florets 2- or 3-seriate, white becoming pink, lamina linear; disk florets yellow to yellow-green, limb campanulate. Achenes ca. 3.5 mm, shortly beaked, apically with a viscid secretion. Fl. Aug.–Oct.

Grasslands, forests on slopes; 2600–3600 m. Guizhou, Hunan, Sichuan, Yixian, Yunnan [Afghanistan, Bhutan, India, Indonesia, Myanmar, Nepal, Pakistan, Thailand, Vietnam; SW Asia (Caucasus, Iran)].


羽裂粘冠草 yu lie nian guan cao

Herbs, perennials, 18–50 cm tall; rhizomes usually curved. Stems erect, sometimes ascending, branched from middle or sometimes simple, branches ascending, spreading, long, glabrous or sparsely strigillose. Leaves: petiole narrowly winged, base expanded and clasping, blade surfaces glabrate or sparsely strigillose along veins, margin sometimes sparsely strigillose-ciliate; basal and lower cauline blade oblanceolate, lyrate or pinnatifid; mid cauline blade homomorphose, oblanceolate to narrowly oblancoate, 4–7 × 1–3.5 cm, pinnatifid, lateral lobes 1- or 2-paired, terminal lobe large, elliptic or long elliptic to ovate, margin serrate (often entire on lobes), mucronulate; upper blade narrowly oblanceolate or narrowly elliptic to (uppermost) linear, pinnatifid or pinnatilobate, to (uppermost) serrate or entire. Capitula hemispheric, 6–8 mm in diam. (in fruit), few in lax racemiform synflorescences (terminal seeming subcorymbose). Phyllaries 3-seriate, subequal, lanceolate or oblong to oblanceolate (inner), 3–4 mm, outer externally strigillose. Ray florets 2- or 3-seriate, tube 0.7–0.8 mm, glandular, lamina linear, 1.15–1.25 × 0.3–0.5 mm, apex rounded, entire; disk floret functionally male, tube 0.2–0.3 mm, limb campanulate, 1.1–1.3 mm, upper tube and limb base glandular, 4(or 5)-lobed, lobes lanceolate, 0.75–0.8 mm. Achenes olive to pale brown, oblanceolate, compressed, 1.8–2.5 mm, short collar viscid. Fl. and fr. Aug.–Sep.

Grasslands, forests on slopes; 2700–3000 m. Sichuan, Yunnan [Vietnam].


岐伞菊属 qi san ju shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Herbs, annual, dwarf, glabrous. Stems ascending to spreading, multibranched. Leaves alternate, simple, serrate or entire. Capitula disciform, small, globose, several, fascicled in divaricately branched corymbiform synflorescences, sessile or slightly pedunculate. Involucre hemispheric; phyllaries 2-seriate, herbaceous, subequal, broad, obtuse, margin scarious, 3-veined, usually slightly shorter than disk. Receptacle flat or convex, glabrous, with fine processes. Florets yellow; female fertile, multiseriate, corolla minutely tubular or lacking, glandular; disk florets functionally male, few, sterile, corolla tubular, tube short, limb funnelform, 4-lobed, lobe margins thickened, sometimes glandular; anther base obtuse, auriculate; style branches short, appressed. Achenes slightly compressed, small, minutely glandular or sparsely scabridulous, veined. Pappus of 6–13 short barbellate bristles in 1 series, of disk florets thin or absent.

Three species: SE Asia; one species in China.

岐伞菊 qi san ju

Herbs, annual, 4–23 cm tall; root fusiform. Stems ascending, branched at base, rarely pilose to glabrate. Leaves winged petiolate, blade obovate-lanceolate to obovate-spatulate, 1–2.5 × 0.5–1.5 cm, surfaces sparsely hispidulous on veins or glabrate, lateral veins 2–4-paired, base attenuate, margin coarsely serrate or entire, apex acuminate. Capitula 2–3 mm in diam., usually 5–10 fascicled. Involucre hemispheric; phyllaries 2-seriate, ovate-oblong, 1.5–2 mm, glabrous, margin entire, 3-veined. Female florets multiseriate, usually without corolla; disk florets few, corolla 1–1.1 mm. Achenes oblong-fusiform, slightly compressed, 0.7–0.8 mm, scabridulous, multiveined. Pappus of 8–13 pinkish bristles 0.44–0.54 mm, slightly shorter than styles in female florets, in disk florets of 6–8 white, smooth bristles ± equaling tube.

Field margins, roadsides; below 100–1000 m. Guangdong, S Yunnan (Xishuangbanna) [Bangladesh, Cambodia, India, Laos, Myanmar, Nepal, Thailand, Vietnam].

121. ESCHENBACHIA Moench, Methodus, 573. 1794.

白酒草属 bai jiu cao shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Dimorphanthus Cassini; Edemias Rafinesque.

Herbs, annual, biennial, or perennial. Stems erect, simple or branched, hirsute or strigose. Leaves alternate, margin entire, serrulate to coarsely serrate, pinnatifid, or pinnatifid. Capitula disciform, few to numerous, in corymbiform, sometimes glomerate, glomerate-paniculiform, or paniculiform synflorescences, rarely cymiform, rarely solitary. Involucre campanulate to hemispheric-campanulate; phyllaries 3- or 4-seriate, imbricate, obovate to obovate-lanceolate, lanceolate, linear-lanceolate, or linear, membranous, green ± widely along midvein, margin and apex scarious. Receptacles hemispheric-flattened, hemispheric-conic to lenticular-knobby, alveolate (central part bearing disk florets distinctly with wider alveolae), fimbriate. Florets fertile. Ray florets female, numerous, white, corolla reduced to filiform tube, elminate, ca. 1/2 as long as style; disk florets bisexual, few to numerous, yellow or yellowish, limb funnelform, lobes 5; anther base obtuse; style branch tip short. Achenes oblong or lanceolate, compressed, ± strigillose, sometimes glandular, margin 2-ribbed. Pappus white to yellowish white or cinnamon to ± reddish, 1-seriate, sometimes basally connate in a ring, often deciduous, of subequal, fine, barbellulate bristles.

Number of species uncertain: Africa, S Asia; six species (three endemic) in China.

The genus Conyza Lessing, nom. cons., to which African and Asian species have been traditionally referred, is an American taxon that is phylogenetically nested within Erigeron, where it is treated here (only introduced species are in China). African and Asian species, however, do not belong to the North American clade but to the unrelated subtribe Grangeinae of the Asteraceae (Brouillet et al. in Funk et al., Syst. Evol. Biogeogr. Compositae, 589–629. 2009), an African group that repeatedly dispersed to S Asia. Eschenbachia is typified by E. globosa Moench, nom. illeg. superfl., based on Erigeron aegyptiacus Linnaeus. Eschenbachia aegyptiacus is part of the African subtribe Grangeinae (J. S. Strijk, pers. comm.). Most native Chinese species previously treated under Conyza appear assignable to Eschenbachia (except for C. stricta, species incertae sedis). The description of the genus given here is based solely on the species present in China.

1a. Leaves pinnatifid or pinnatifidate.

2a. Mid leaves pinnatifidate, petiole base subclasping; capitula 12–15 mm in diam., in dense corymbiform

synflorescences .................................................................................................................................................... 1. E. aegyptiacus

2b. Mid leaves pinnatifidate, petiole base not clasping; capitula 6–10 mm in diam., in short, narrow,

paniculiform synflorescences .................................................................................................................................... 2. E. blinii

1b. Leaves coarsely serrate or serrulate.

3a. Annual or biennial herbs, taproot fusiform.

4a. Stems densely villous, densely short-stipitate viscid glandular; mid cauline leaves shortly petiolate or

subsessile, not clasping; capitula 3.1–7.9 mm in diam., in broadly paniculiform synflorescences; ray

florets 1/5 or less as long as style .......................................................................................................................... 3. E. leucantha

4b. Stems scabrous (below) to villous, eglandular; mid cauline leaves sessile, base subclasping; capitula

7.5–11 mm in diam., in glomerate or dense corymbiform synflorescences; ray florets 1/2 or less as

long as style ......................................................................................................................................................... 4. E. japonica

3b. Perennial herbs, rhizome or caudex woody.

5a. Capitula 4–5 mm in diam.; phyllary margin narrowly scarious; cauline leaves oblong-lanceolate to

lanceolate, coarsely serrate; disk floret lobes glabrous ................................................................. 5. E. perennis

5b. Capitula 6–7 mm in diam.; phyllary margin ± broadly scarious; cauline leaves linear-oblong-lanceolate to

linear, sparsely serrulate or subentire; disk floret lobes hairy at apex .................................................. 6. E. multiensis

埃及白酒草  ăi ji bai jiù cao


Herbs, annual, 20–100 cm tall; taproot woody, fibrous rooted. Stems erect, branched from base or middle, branches ascending, striate, densely white long hirsute, stipitate glandular. Leaves: lower withered at anthesis; mid sessile, blade narrowly oblong to oblanceolate, 4.5–9.5 × 1.4–3 cm, surfaces densely hirsute, densely stipitate glandular, veins slightly prominent, base subclasping, margin pinnatifid lobed, lobes in 6 or 7 pairs, narrowly oblong, apex obtuse, terminal lobe larger, apiculate; upper oblong, gradually reduced, pinnatifid; uppermost lanceolate or linear-lanceolate, serratate only at base. Capitula 12–15 mm in diam., 2–4 in dense corymbiform synflorescences; peduncles slender, 1.5–4.5 cm, densely strigose-villous. Involucre hemispheric-campanulate, ca. 8 × 15 mm; phyllocoxae; peduncles slender, 1.5–4.5 cm, densely strigose-villous. Involucre hemispheric-campanulate, ca. 6 × 10 mm; phyllaries 3- or 4-seriate, outer green, linear-lanceolate, abaxially hispid-villous; disk florets 40–50, 4–4.5 mm, ± densely stipitate glandular, ± densely stipitate glandular, ± densely stipitate glandular, apiculate, often ca. 3.5 mm, inner 6–7 mm, apex reddish purple, scarios, slightly reflexed. Florets yellow. Ray florets reduced to tube, filiform, 2–2.5 mm, almost 1/2 as long as style, sparsely puberulent above or glabrous; disk florets 40–50, 4.5–4.5 mm, tube ± puberulent, limb funnelform, lobes lanceolate. Achenes oblong to oblanceolate, compressed, 0.8–1 mm, strigose. Pappus 1-seriate, basally ciliate in a ring, sometimes deciduous, white to yellowish white or cinnamon, bristles slightly longer than disk corollas.

- Grasslands on slopes, around boulders in karst formations, open places, roadsides; 1800–2600 m. Guizhou, Sichuan, Yunnan.


粘毛白酒草  nián mào bai jiù cao


Herbs, annual, 40–200 cm tall, sometimes bushy; taproot fusiform, woody, fibrous rooted. Stems erect, branched, upper branches divaricate, striate, densely villous, densely short-stipitate viscid glandular, densely leafy. Leaves: lower withered and fallen at anthesis; mid cauline shortly petiolate or subsessile, not clasping, blade elliptic-oblong to oblanceolate, 7–14 × 2.5–3.5 cm, surfaces ± densely sessile glandular, abaxially villous, adaxially scabrous, lateral veins 4–6-paired, abaxially prominent, base cuneate to attenuate, margin serrate to serrulate, teeth mucronulate, apiculate; outer blade lanceolate, reduced upward; uppermost (on synflorescence branches) sessile, 3–5 mm, margin entire or serrulate. Capitula 3.1–7.9 mm in diam., numerous, in broadly glomerate-paniculiform synflorescences; peduncles slender, 3–9 mm, densely long-stipitate glandular and/or villous. Involucre campanulate, 3.1–4 × 3.5–6.2 mm; phyllaries 3- or 4-seriate, outer green, linear-lanceolate, short, abaxially ± densely stipitate glandular and/or villous, margin sometimes narrowly scarios, acuminate, inner linear-lanceolate to linear-oblong, green along midvein, margin scarios, sometimes purplish, apiculate, often purplish. Ray florets white, reduced to tube, filiform, 0.3–0.65 mm, 1/5 or less as long as pinkish style, lacerate at apex, glabrous; disk florets 6–9, yellow becoming reddish, funnelform, 3.5–4.1 mm, tube ca. 2.2 mm, sparsely hairy above, limb ca. 3.9 mm, lobes lanceolate, ca. 0.6 mm. Achenes straw-colored to pale brown, lanceolate, compressed, 0.4–0.6 mm, sparsely strigillose. Pappus 1-seriate, basally ciliate in a ring, deciduous, yellowish or cinnamon to pale reddish, bristles 10–15, 3.5–4.5 mm. Fl. Sep–Dec.

- Open slopes, ravines, field margins, dry margins of woods, thickets, roadsides, wastelands; 200–1800 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Yunnan; Bangladesh, Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Nepal, Thailand, Vietnam; Australia.


白酒草  bái jiù cao

*Erigeron japonicus* Thunberg in Murray, Syst. Veg., ed.
Herbs, annual or biennial, (15-)20–45+ cm tall; taproot simple, fusiform. Stems erect, branched from base or middle, sometimes simple, branches ascending or spreading, striate, white scabrous (below) to villous, more densely so upward, sometimes ± glabrescent below, eglandular. Leaves usually crowded in lower part, basal in rosette, shortly to long petiolate, petiole ± narrowly winged, blade elliptic or obovate to spatulate, 6–7 cm, base attenuate to rounded, apex rounded to obtuse; lower long petiolate, petiole often broadly winged upward, blade oblanceolata-oblanceolate, 3–13 cm, surfaces white villous, lateral veins ±-3-paired, abaxially prominent, base cuneate or attenuate, margin ± coarsely serrate, teeth mucronulate, striiform, apex rounded to obtuse or acute; mid dispersed, sessile, blade oblanceolata-oblanceolate or oblanceolata-lanceolate to lanceolate, 3.5–5 × 0.5–1.5 cm, base rounded, subclasping, margin serrate to serrulate, apex obtuse to acute; upper reduced, blade lanceolate or linear-lanceolate, surfaces strigose, eglandular, adaxially scabrous (and sometimes also abaxially), margin entire to sparsely serrulate. Capitula numerous, 7.5–11 mm in diam., usually crowded in glomerate or dense cymiform synflorescences; peduncles slender, 4–6 mm, densely villose. Involucrum campanulate to hemispheric-campanulate, 4–5.5 × 7.5–10 mm; phyllaries 3- or 4-seriate, abaxially villous, outer shorter, obovate to ovate-lanceolate, 2–2.9 mm, apex obtuse, inner lanceolate to linear, 3.8–5 mm, margin ± widely scarious, erose, often ± purplish (notably apically), apex acute or acuminate. Ray florets white becoming purplish, corolla filiform, 1.1–2 mm, 1/2 or less as long as style, apically ciliate; disk florets 15 or 16, pale yellow becoming reddish, 4–4.1 mm, tube ca. 2.25 mm, hairy distally, limb ca. 1.75 mm, lobes lanceolate, ca. 0.5 mm, apically hairy. Achenes straw-colored to pale brown, oblong, 1.2 mm, sparsely strigillose. Pappus basally coninate in a ring, deciduous, pinkish white or cinnamon to reddish, bristles 10–14, 3.3–4.5 mm, Fl. Mar–Sep.

Forest margins, grassy slopes, dry meadows, exposed slopes, field margins, roadsides, gardens; 400–2500 m. Anhui, Fujian, Guangdong, Guanxi, Guizhou, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Afghanistan, Bhutan, India, Japan, Malaysia, Myanmar, Nepal, Pakistan, Thailand, Vietnam].

5. Eschenbachia perennis (Handel-Mazzetti) Brouillet, comb. nov.


Herbs, perennial, 25–40 cm tall, collar surrounded by marcescent leaf bases; rhizomes thick, woody, erect or ascending. Stems solitary, erect, simple, striate, white hisutre, often also strigillose. Leaves: basal roslulate, present at anthesis; basal and lower petiolate, petiole narrowly winged, usually 1/2 as long as blade, densely hisutre and hisutre-ciliate, petiole base clasing or subclasing, blade ovate or elliptic-ovate to lanceolate or ob-lanceolate, 5.9–1.5–2.5 cm, surfaces sparsely hirsute, base attenuate, margin coarsely serrate, hirsute-ciliate, lateral veins 3- or 4-paired, apex acute to obtuse; upper short petiolate or sessile, blade oblanceolata-lanceolate to lanceolate, gradually reduced; uppermost base almost rounded, margin entire, apex acuminata. Capitula 4–5 mm in diam., numerous, usually in dense cymiform or partly glomerate synflorescences; peduncles 5–6 mm; bracteole 1, lanceolate, villous to strigillose or gla-brate. Involucrum campanulate, ca. 4 mm in diam.; phyllaries 3-seriate, lanceolate to linear-lanceolate, outer ca. 1/2 as long as inner, abaxially strigillose, margin narrowly scariosus, sometimes erose-fimbriate apically, apex acuminata, inner 2.5–3.5 mm. Ray floret corolla reduced to tube, filiform, 1–1.5 mm, ca. 1/2 as long as style, apex hairy; disk florets ca. 23, ca. 3 mm, lobes lanceolate, glandular. Achenes oblong, ca. 0.7 mm, sparsely pilose to glabrate. Pappus white, almost equalling disk corollas. Fl. Feb–Apr.

- Thickets on sandy ground by riverbanks; ca. 1600 m. SW Guizhou, S Yunnan.


木里白酒草 μ li bai jiu cao


Herbs, perennial, 3–21 cm tall, sometimes caespitose, collor surrounded by leaf base remains; caudex woody, ascending, branched, taprooted. Stems solitary or 2–4, slender, erect, simple, gray-white long strigose. Leaves: surfaces moderately long strigose, glabrescent, margin often serrulate distally, teeth mucronulate, rarely entire, striiform-ciliate; basal in rosette, present at anthesis, long petiolate, petiole narrowly winged, petiole base widened, clasing, blade oblanceolata to spatulate, 2.5–3.5 × 0.3–0.5 cm, base cuneate-attenuate, apex obtuse to acute, mucronate; cauline scattered, lowest petiolate, upper sessile or sub-ses-sile, not clasing, lower blade linear-oblong to lanceolate, 2.5–3.5 × 0.1–0.3 cm, base attenuate, margin sparsely serrulate or subentire, apex acute; upper blade gradually reduced, linear, margin entire or with 1 or 2 inconspicuous teeth. Capitula 6–7 mm in diam., usually 3–6 in cymiform synflorescences, rarely solitary; peduncles slender, 3–8 mm. Involucrum campanulate, ca. 4 × 6–8 mm; phyllaries 3-seriate, narrowly oblong or lanceolate, abaxially sparsely strigose, margin ± broadly scariosus, erose-lacerate, apex acuminata or ± obtuse, outer ca. 1/2 as long as inner. Ray floret corolla reduced to tube, filiform, 1–1.2 mm, ca. 1/2 as long as style, apex hairy; disk florets 13–23, yellowish, narrowly funnelform, 2.5–3 mm, tube 1–1.5 mm, lobes lanceolate, ca. 0.5 mm, apex hairy. Achenes oblong, 1–1.2 mm, sparsely strigose, glandular. Pappus dirty to pinkish white, bristles ca. 10, 2.5–3.2 mm. Fl. Jun.

- Sandy riverbanks; ca. 2200 m. SW Sichuan (Muli).
Species incertae sedis

**Conyza stricta** Willdenow, Sp. Pl. 3: 1922. 1803.

**劲直白酒草** jin zhi bai jiu cao

Herbs, annual, woody taprooted, and fibrous rooted. Stems erect, 30–65 cm tall, finely striate, multibranched from base or middle, branches slender, strict, densely grayish scabrous, ± densely sessile or short-stipitate glandular, densely leafy. Basal leaves fallen at anthesis; lower and mid cauline petiole narrowly winged, blade obovate, sometimes ob lanceolate, 3–5.5 × 0.5–1.3 cm, surfaces densely grayish scabrous, densely sessile or short-stipitate glandular, lateral veins 3- or 4-paired, abaxially distinct, base obovate, sometimes ob lanceolate, sometimes oblong-lanceolate, margin narrowly scarious, entire, apex acuminated, sometimes 3-fid; upper leaves gradually reduced, simple. Fl. (Aug–)Sep–Nov.

**Conyza stricta** var. **stricta**

**劲直白酒草（原变种）** jin zhi bai jiu cao (yuan bian zhong)

Stems 30–65 cm tall, branched. Lower leaf margin coarsely serrate, rarely entire; upper leaves gradually reduced, simple. Fl. Sep–Nov.

Grasslands on slopes, field margins; 1100–2300 m. Hainan, Sichuan, Yunnan [Bhutan, India, Myanmar, Nepal, Thailand, Vietnam; E Africa].

**Conyza stricta** var. **pinnatifida** Kitamura in H. Harra, Fl. E. Himalaya, 337. 1966.

**羽裂白酒草** yu lie bai jiu cao

**Erigeron pinnatifidus** D. Don, Prodr. Fl. Nepal. 172. 1825, not Thunberg (1800); **Conyza absinthifolia** Candolle; **C. mairei** H. Léveillé; **C. pinnatifida** Buchanan-Hamilton ex Roxburgh (Oct–Dec 1832), not (Thunberg) Lessing (Jul–Aug 1832), nor Franchet (1886), nor Dunn (1903); **E. trisulcus** D. Don.

Stems 30–45 cm tall, usually branched from middle or base, rarely simple. Lower leaf margin deeply repand-pinnatilobate, lobes 2-paired, oblong-oblancoate or cuneate, margin entire, terminal lobe larger; upper leaves and those on branches 3-fid. Fl. Aug–Nov.

Grasslands on slopes; 1800–2600 m. Sichuan, S Xizang, Yunnan [Afghanistan, Bhutan, India, Myanmar, Nepal, Pakistan, Thailand, Vietnam; E Africa].

**122. MICROGLOSSA** Candolle, Prodr. 5: 320. 1836.

**小舌菊属** xiao she ju shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Vines [or subshrubs], woody, climbing [or erect]. Leaves alternate, petiolate, blade ovate, margin entire or crenulate. Capitula disciform, small, numerous, in crowded compound-corymbiform synflorescences. Involucre campanulate; phyllaries multiseriate, imbricate, oblong-lanceolate or linear, scabrid, apex obtuse, outer shorter. Receptacles convex [or flat], alveolate, naked, glabrous. Florets yellow, fertile. Ray florets female, 1.1–1.7 mm, tube 0.8–1.4 mm, sparsely hairy, limb 0.7–0.9 mm, lobes 0.3–0.5 mm, lanceolate, glandular, sometimes eglandular. Achenes narrowly ovate, 0.3–0.65 mm, sparsely striate, margin slightly 2-ribbed. Pappus orangish, ± 2-seriate, outer very short, thin, inner of 12–15 barbellate bristles 1–1.9 mm, almost equaling disk corollas. Fl. (Aug–)Sep–Nov.

Grasslands on slopes, field margins; 1100–2600 m. Hainan, Sichuan, S Xizang, Yunnan [Afghanistan, Bhutan, India, Myanmar, Nepal, Pakistan, Thailand, Vietnam; E Africa].

**Conyza stricta** belongs to the polyphyletic African conyzas. In phylogenies (J. S. Strijk, pers. comm.), it is distinct from the species here placed in *Eschenbachia*, close to the African genus *Nidorella* Cassini. It is yet unclear whether it belongs there or in a new, separate genus. It does not belong in *Conyza* s.s., a synonym of *Erigeron*.

1a. Lower leaf margin coarsely serrate, rarely entire; upper leaves gradually reduced

1b. Lower leaf margin deeply repand-pinnatilobate, lobes 2-paired, oblong-oblancoate or cuneate, margin entire, terminal lobe larger; upper leaves and those on branches 3-fid
Leaves abaxially pale green, adaxially green, ovate, 5–10 × 2.5–4 cm, abaxially densely stipitate glandular, veins densely ferruginous villous, adaxially scabrid, base attenuate, margin undulate, crenulate, veins pronounced, apex acuminate, mucronate. Capitula 5–6 mm in diam., numerous in axillary or terminal, dense compound-corymbiform synflorescences. Involucre campanulate; phyllaries 4- or 5-seriate, membranous, midvein brown, apex obtuse, ± erose, outer ovate-lanceolate, 0.7–2 mm, abaxially sparsely villous, stipitate glandular, midvein pronounced, distally enlarged, middle and inner linear-lanceolate, 2–5 mm, margin hyaline, midvein thin, glabrous, middle sometimes ± stipitate glandular, inner eglandular. Receptacles convex. Ray florets numerous, lamina filiform, ca. 1 mm; disk florets yellow, ca. 5 mm, tube and limb base hairy, limb funnelform, ca. 2.5 mm, lobes 5, linear-triangular, ca. 1 mm. Achenes obovoid, slightly compressed, ca. 1 mm, 3- or 4-ribbed, sometimes veined, sparsely strigillose, stipitate glandular apically. Pappus 2- or 3-seriate, of cinnamon to reddish or white, thin bristles, outer 0–2, ca. 1 mm, inner ca. 4 mm, tapering, innermost 4.2–4.5 mm, slightly clavate. Fl. and fr. year-round.

Thickets on slopes, open forests, forest margins, stream banks, wastelands, edges of bamboo plantations; sea level to 1800 m. Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Yunnan [Bangladesh, Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, N Thailand, Vietnam; Africa].


雏菊属 chu ju shu

Chen Yelin (陈艺林 Chen Yi-ling); Luc Brouillet

Herbs, annual or perennial, scapose, caespitose, or stem rarely branched. Leaves rosulate, blade spatulate or oblanceolate, entire or repand-dentate. Capitula radiate, often solitary, heterogamous, pedunculate or scapose. Involucre hemispheric or broadly campanulate; phyllaries 2-seriate, unequal to subequal, leaflike. Receptacle ± flat, alveolate, alveola margin crenulate, naked. Ray florets 1-seriate, white, often tinged purplish crimson, apically entire; disk florets numerous, yellow, fertile; style branch tips short, triangular. Achenes obovoid, compressed, 2-ribbed, beakless. Pappus absent or rarely of few, very short, basally connate bristles.

Eight species: Asia, Europe; one species (introduced) in China.


雏菊 chu ju

Herbs, perennial or annual, scapose, 10–25 cm tall; scape sparsely villosulous, strigose, sparsely, minutely stipitate glandular distally (near capitulum). Leaves basal, rosulate, petiole long, winged, blade spatulate, 2–6 × 0.9–2.8 cm, base attenuate, margin serrate to crenate, apex obtuse, sometimes retuse, mucronulate. Capitula terminal, solitary. Involucre hemispheric or broadly campanulate, 5–6 mm; phyllaries 2-seriate, subequal, obovate, leaflike, surfaces sparsely villos, margin narrowly scarios, sparsely ciliate, midvein thin, translucent, apex obtuse, scarious, ciliate. Ray florets white or pinkish, lamina ca. 10 × 1 mm; disk florets numerous, yellow, fertile; style branch tips short, triangular. Achenes obovoid, compressed, 2-ribbed, beakless. Pappus absent or rarely of few, very short, basally connate bristles.

Ravines. Sichuan [native to N Africa (Morocco), SW Asia, and Europe; widely introduced and naturalized elsewhere].

An ornamental, this species is widely cultivated in gardens and parks.


碱菀属 jian wan shu

Chen Yelin (陈艺林 Chen Yi-ling); Luc Brouillet

Herbs, annual. Stems erect. Leaves alternate, entire or sparsely serrate. Capitula radiate, in corymbiform synflorescences. Involucre cylindric-campanulate; phyllaries 2- or 3-seriate, outer shorter, loosely imbricate, fleshy becoming membranous when dry, 3- or more veined, margins scarios. Receptacle ± flat, alveolate, alveola margin crenulate, naked. Florets fertile. Ray florets female, 1-seriate, lamina bluish white to bluish violet or pinkish; disk florets bisexual, numerous, yellow, narrowly funnelform, 5-lobed; anther base obtuse; style branch tips lanceolate. Achenes monomorphic, narrowly oblong, compressed, glabrous or sparsely strigose, margin 2-ribbed, faces 1-veined. Pappus in 3 or 4+ series, of white to dirty white or pinkish to reddish, thin, barbellate bristles, conspicuously elongating after anthesis, becoming 2 × as long as involucre.

One species: N Africa, Asia, Europe.


碱菀 jian wan


乳菀属 ru wan shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet


Herbs, perennial; rhizome robust. Stems erect or ascending, usually branched above, rarely simple. Leaves sessile, blade oblong or lanceolate to linear, often gland-dotted, lower 3-veined, mid and upper 1-veined, margin entire, often recurved. Involucre radiate, sometimes discoid, small or medium-sized, in corymbiform synflorescences, rarely solitary. Involucre obconic or campanulate to almost hemispheric; phyllaries 3–5-seriate, greenish or green along midvein, imbricate, membranous, glabrous or puberulent, 1–3-veined, margin usually scarious, outer lanceolate to lanceolate-ovate, apex acute, innermost oblong to oblong-lanceolate, margin more widely scarious, rounded or ± obtuse, apex sometimes acute. Receptacles slightly convex, alveolate, fimbriate. Ray florets sterile, without style, 5–20 in 1 series, rarely absent, lamina pinkish or bluish violet; disk florets bisexual, fertile, 5–60(–100), yellow, more widely scarious, rounded or ± obtuse, apex sometimes acut e. Receptacles slightly convex, alveolate, fimbriate. Ray florets present; leaves lanceolate to oblanceolate or linear-lanceolate, 5–10 × 0.3–1.2 cm, margin entire or slightly crenulate, apex acute to ± clavate.

About 40–50 species: C and S Europe to NE Asia; 11 species in China.

The genus Crinitaria, often considered distinct (see Crinitina below), is typified by Chrysocoma biflora Linnaeus, a species that belongs to Galatea (Soják, Zprávy Krajsk. Vlastiv. Muz. Olomouci 215: 1–2. 1982).

1a. Leaves not gland-dotted, lower 3-veined, mid and upper 1-veined, or all 1-veined; plants glabrous, glabrulate, or sparsely to ± densely arachnoid.

2a. Ray florets absent; leaves linear, 1-veined, upper setiform; phyllaries abaxially shortly arachnoid (partly glabrescent) ................................................................................................................................. 11. G scoparia

2b. Ray florets present; leaves lanceolate to lanceolate-ovate or linear-lanceolate, usually 3-veined, upper (sometimes some mid) linear; phyllaries abaxially glabrate or glabrous.

3a. Lower and mid leaves lanceolate to lanceolate-ovate or linear-lanceolate .......................................................................................................................... 9. G hauptii

3b. Lower and mid leaves linear-lanceolate.

4a. Involucre subhemispheric; ray florets 15–20, light bluish violet; pappus brownish to pinkish ...... 8. G tianschanica

4b. Involucre broadly obconic; ray florets 10–15, pinkish violet; pappus yellowish .................................. 10. G angustissima

1b. Leaves gland-dotted on both surfaces or adaxially, sometimes inconspicuously so, lower and mid 3-veined, or mid and upper 1-veined; plants shortly papilliform hairy or glabrate.

5a. Ray florets absent (rarely 1–4).

6a. Leaves oblong-lanceolate or lanceolate to linear-lanceolate, lower and mid 3-veined; capitula numerous in corymbiform synflorescences .................................................................................................................. 6. G biflora

6b. Leaves linear or linear-lanceolate, lower 3-veined, mid 1-veined; capitula solitary or 2 or 3 in corymbiform synflorescences .................................................................................................................. 7. G regelii

5b. Ray florets 4–20, rarely absent.


8a. Capitula numerous, usually in dense synflorescences; phyllaries 3-veined, rarely 1-veined, abaxially glabrate .................................................................................................................. 4. G punctata

8b. Capitula few, in loose synflorescences; phyllaries usually 1-veined, rarely partly 3-veined, abaxially ± shortly arachnoid .................................................................................................. 5. G fastigiformis


Y. Ling and Y. L. Chen (FRPS 74: 269. 1985) regarded Galatella songorica as distinct from G. macrosciadia based on the more numerous capitula with smaller, differently shaped phyllaries, and on distribution. Such differences may be the result of phenotypic plasticity, a trade-off between the number and size of capitula in different ecological conditions, such as higher elevations. On the other hand, Koroljuk (in Kasnobilov, Fl. Siberia 13: 39–43. 2007) reduced G. songorica and G. macrosciadia to synonyms of G. dahurica. Measurements among these taxa overlap significantly, and we are recognizing a single entity, as does Koroljuk.

Y. Ling and Y. L. Chen (loc. cit.: 269, 360–361) recognized four, mostly rare, varieties in Galatella songorica: G. songorica var. songorica, G. songorica var. discoidea, G. songorica var. angustifolia, and G. songorica var. latifolia. The type of G. songorica var. discoidea is a specimen with immature, unopened capitula, and it is impossible to determine whether or not they are discoid; the distinguishing features are all based on the capitula, and the variety does not appear to warrant recognition. Galatella songorica var. angustifolia and G. songorica var. latifolia are both based on leaf width, a plastic character. The type (and single specimen seen) of G. songorica var. latifolia is from moister places, and this may be responsible for the slightly greater width of leaves. Both of these varieties appear to represent extremes of leaf variation and hardly appear to warrant recognition, at least until more material is collected and a morphometric study is done.


Herbs, perennial, 28–80 cm tall, papilliform hairy, sparingly scabridulous, thinly shortly arachnoid; rhizome thick. Stems numerous, rarely solitary, erect. Leaves dense, sessile, blade lanceolate-oblong or linear-lanceolate to linear, adaxially oradially or rarely both surfaces gland-dotted, base cuneate, 3-veined, apex long acuminate, mucronate; lower withered after anthesis; mid blade 4–6(–8) × 0.3–0.6 cm; upper reduced, blade linear, 5–10 mm. Capitula numerous, in dense, rarely slightly loose, corymbose synflorescences, 7–12 × 8–12 mm. Involucre broadly obconic to campanulate, 3–5 × 4–6 mm; phyllaries 3- or 4-seriate, pale green, abaxially glabrate, margin narrowly to ± broadly scarious, erose-fimbriate, 3-veined, rarely partly 1-veined, outer small, ovate-lanceolate, apex acute, inner larger, oblong, apex obtuse or acuminate. Ray florets 5–10, pinkish violet, lamina 10–12 × ca. 2 mm; disk florets 10–15, pale yellow, sometimes pinkish violet tinged, 5–6 mm, limb funnelform, lobes long, oblong-lanceolate. Achenes oblong, 3.5–4 mm, densely white stigose. Pappus brownish, 5–6 mm. Fl. Jul–Sep.

Grasslands on slopes; ca. 1700 m. N Xinjiang [Kazakhstan, Russia] [Siberia]; SW Asia, Europe.


扫枝乳菀 szao zhi ru wan

Herbs, perennial, 25–100 cm tall, shortly papilliform hairy; rhizome thick. Stems solitary or several, erect. Leaves lax or dense, sessile, blade linear-lanceolate or linear, adaxial surface or rarely both surfaces gland-dotted, or indistinctly gland-dotted abaxially, 3-veined, lateral often inconspicuous, base cuneate, apex long, rarely shortly, acuminate; mid 4–5.5 × 0.35–4 cm; upper (in synflorescences) reduced, linear, 1.5–2 × 0.1–0.2 cm. Capitula few, rarely 2 or 3, in relatively loose corymbose synflorescences, 7–10 × 7–12 mm; peduncles ascending or curved. Involucre obconic, 3.5–5 × 6–6.5 mm; phyllaries 3- or 4-seriate, light yellowish green, membranous, usually 1- or rarely partly 3-veined, margin scarious, erose-fimbriate, shortly arachnoid ciliate, outer ovate-lanceolate, abaxially ± shortly arachnoid, apex acute, inner larger, oblong-lanceolate, glabrous or glabrate, apex obtuse or acute. Ray florets 4–8, pale pinkish violet, lamina ca. 10 × 1.5 mm; disk florets 11–15, pale yellow, 5–6.5 mm, limb narrowly funnelform, lobes oblong-lanceolate. Achenes oblong to lanceolate, 3.5–4 mm, white long stigose, 3-veined. Pappus whitish to yellowish, slightly longer than disk corollas. Fl. and fr. Jul–Sep.

Grasslands on slopes, salt marsh meadows. N Xinjiang (Shawan) [Kazakhstan, Russia, Uzbekistan].


盘花乳菀 pan hua ru wan

Chrysocoma biflora Linnaeus, Sp. Pl. 2: 841. 1753; Crinaria biflora (Linnaeus) Cassini; Galatella dracunculoides Nees var. discoidea Candolle.

Herbs, perennial, caespitose, 45–100 cm tall, shortly papilliform hairy, scabridulous or glabrate; rhizome short. Stems numerous, rarely solitary, erect. Leaves dense, lower fallen after anthesis, mid sessile, usually dingy green, blade oblong-lanceolate or lanceolate to linear-lanceolate, 5.5–6 × 0.4–0.5 cm, surfaces gland-dotted or abaxially eglandular, scabridulous or glabrate, 3-veined, base gradually cuneate, apex long acuminate; upper reduced, linear-lanceolate. Capitula numerous, in usually dense, rarely slightly loose, corymbose synflorescences, 8–11 × 10–12 mm. Involucre broadly obconic to campanulate, 3.5–4–7 mm; phyllaries 3- or 4-seriate, yellowish green, membranous, abaxially glabrate or ± scabridulous, 3-veined, rarely partly 1-veined, margin scarious, erose-fimbriate, outer small, ovate-lanceolate; apex acute, innermost larger, oblong, apex obtuse or acute. Ray florets usually absent, rarely 1–3(or 4); disk florets 8–25, pale yellow, 6–7 mm, limb funnelform, lobes long, oblong-lanceolate. Achenes oblong, 3.5–4 mm, densely white silky. Pappus whitish, 5–6 mm. Fl. and fr. Jul–Sep.

Grasslands on slopes; ca. 1700 m. W Xinjiang [Kazakhstan, Russia].


昭苏乳菀 zhao su ru wan

Herbs, perennial, 25–45 cm tall, shortly papilliform hairy, scabridulous. Stems numerous, ascending, sparsely sessile glandular. Leaves dense, lower withered and fallen after anthesis, sometimes 3-veined, mid sessile, dingy green, blade linear or linear-lanceolate, 3–4 × ca. 0.2 cm, both surfaces or adaxial surface gland-dotted, 1-veined, base cuneate, apex shortly acuminately, mucronate; upper reduced, linear. Capitula solitary or 2 or 3 in loose corymbiform synflorescences, 8–11 × 12–14 mm, with florets. Involucre broadly obovate, 4–5 × 5–8 mm; phyllaries 3-seriata, greenish, abaxially glabrous or glabrate, 1-veined, or partly 3-veined, margin scarious, erose-laciniate, outer, short, lanceolate, apex acute, innermost oblanceolate, 1-veined, outer short, ovate-lanceolate, apex acute, inner long, oblong, apex rounded or obtuse, sometimes acute. Ray florets 10–15, lamina pinkish violet, oblong, 13–15 × 2–3 mm; disk florets 45–50, pale yellow, often becoming pinkish purple tinged, 6–7 mm, limb narrowly funnelform, lobes oblong-lanceolate. Achenes oblong, 5–5.5 mm, white strigose. Pappus whitish, 5–7 mm. Fl. Jul–Sep.

Mountain slopes, grasslands, stony slopes; 1100–1800 m. N Xinjiang [Kazakhstan, Mongolia, Russia].


窄叶乳菀 zhai ye ru wan

Aster angustissimus Tausch, Flora 11: 487. 1828; Galatella hauptii (Ledebour) Lindley ex Candolle var. temufoila (Lindley ex Candolle) Avé-Lallemant; G. temufoila Lindley ex Candolle.

Herbs, perennial, 10–50 cm tall, sparsely shortly arachnoid, rapidly glabrescent (glabrous or glabrate), upper part sparsely shortly arachnoid. Stems solitary or several, erect or ascending. Leaves dense, sessile, green, not gland-dotted, base attenuate or cuneate, margin revolute, scabridulous, apex acuminate or sometimes obtuse (lower), mucronate; lower linear-lanceolate, to 0.4 cm wide, 3-veined; mid and upper usually linear, 2–4 × 0.1–0.2(–0.3) cm, 1-veined; uppermost (on synflorescence branches) numerous, reduced, bractlike. Capitula numerous, in lax corymbiform synflorescences, 8–18 × 10–15 mm. Involucre broadly obovate, 5–7 × 8–12 mm; phyllaries 4- or 5-seriata, greenish, often pinkish at tip, abaxially glabrate, membranous, margin narrowly scarious, erose, shortly arachnoid ciliate, sometimes keeled or rounded, thickened, 1-veined, outer ovate-lanceolate, apex acute, inner longer, oblong-lanceolate, apex rounded or obtuse. Ray florets 10–15, pinkish violet, lamina oblong, 13–15 × 2–3 mm; disk florets 10–35, pale yellow, 6–7 mm, limb funnelform, lobes lanceolate. Achenes oblong, 3.5–5 mm, white strigose, 3-ribbed. Pappus yellowish, 5–7 mm. Fl. Jul–Sep.

Dry grasslands, steppes, stony slopes; 900–2000 m. N Xinjiang [Kazakhstan, Mongolia, Russia (Siberia)].


卷缘乳菀 juan yuan ru wan


Herbs, perennial, 25–45 cm tall, ± sparsely to densely shortly arachnoid-tomentose, partly glabrescent; rhizome...
woody. Stems numerous, rarely solitary, erect or ascending. Leaves sessile, grayish green, linear, 2–4 × 0.1–0.2 mm, not gland-dotted, subleafy, 1-veined, base tapered, margin strongly revolute, apex acute, arched, mucronate; lowest caducous, blades linear, sometimes 3-veined (lateral veins inconspicuous); upper (in synflorescences) reduced, almost setiform. Capitula 3–5 in loose, often irregularly corymbiform synflorescences, 12–17 × ca. 17 mm. Involucre broadly obconic, 10–15 × 10–18 mm; phyllaries 4–6-seriate, light green, grayish, subleafy, abaxially shortly arachnoid, partly glabrescent, margin narrowly scarios, erose-fimbriate, shortly arachnoid ciliolate, 1-veined, outer small, ovate or ovate-lanceolate, apex acute, inner larger, oblong, apex usually rounded to obtuse. Disk florets 14–20, pale yellow, 6.5–8 mm, limb narrowly funnelform, lobes oblong-lanceolate. Achenes oblong, 4–6 mm, densely white strigose. Pappus brownish, 6–7 mm. Fl. Jul–Sep.

Dry steppes, slopes, gravel. N Xinjiang [Kazakhstan, Russia].


麻莞属 ma wan shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Linosyris Cassini (1825), not Ludwig (1757).

Herbs, perennial; rhizomes slender and long, nodose. Stems several or solitary, erect or ascending, usually branched above. Leaves alternate, sessile, oblong to narrowly linear, gland-dotted or not, sometimes obscurely so, 1-veined, margin entire. Capitula discoid, numerous, in dense or loose, corymbiform synflorescences, rarely solitary. Involucre shortly cylindric or obconic; phyllaries 3- to multiseriate, imbricate, greenish, glabrate or glabrescent, subleathery or membranous, margin usually narrowly scarious, midvein ± distinct, outer either much shorter or almost equaling length of inner but narrower, ovate, inner oblong, apex obtuse or ± acute. Receptacles slightly convex, irregularly alveolate. Disk florets fertile, bisexual, yellow, 5–40, usually exceeding involucre in length, lobes 5, lanceolate; anther base obtuse, apical appendage lanceolate; style branch tips ovate-lanceolate. Achenes oblong, abaxially ± flattened, long strigose, margin 1- or 2-ribbed. Pappus 2-seriate, of whitish or brownish, barbellate bristles, exceeding achenes.

About five species: mostly in steppe and forest-steppe zones of Europe and Asia; two species in China.

Current phylogenetic data are insufficient to determine whether Crinitina is sister to Galatella, paraphyletic to it, or derived from within it (in the latter two cases, it could be merged under Galatella as is sometimes done).

1a. Plants sparsely arachnoid, glabrescent; leaves linear to linear-oblongate or oblong-linear, gland-dotted ............... 1. C. tatarica

1b. Plants gray tomentose; leaves oblong to linear-oblong, obscurely gland-dotted .............................................. 2. C. villosa


新疆麻菀 xin jiang ma wan

Chrysocoma tatarica Lessing, Linnaea 9: 186. 1834; Crinitina tatarica (Lessing) Soják; Linosyris tatarica (Lessing) C. A. Meyer.

Herbs, perennial, ± caespitose, 10–35 cm tall, sparsely arachnoid, glabrescent. Stems several, erect or ascending. Leaves linear to linear-oblongate or oblong-linear, 1–3 × 0.15–0.4 cm, both surfaces or only adaxially gland-dotted, scarious, subleafy, 1-veined, base gradually attenuate to cuneate, apex obtuse, sometimes mucronate; upper reduced. Capitula numerous, in dense corymbiform synflorescences (bracts grading into phyllaries), 8–10 mm. Involucre shortly cylindric or obconic, 3.5–5 mm; phyllaries 3- or 4-seriate, yellowish green, abaxially sparsely arachnoid to glabrate, thinly leathery, margin arachnoid, outer short, ovate, 1–3-veined, apex obtuse or acute, inner larger, oblong, 3–5-veined, margin broadly scarios, erose, apex obtuse. Disk florets 5–10, pale yellow, tubular, 5–6 mm. Achenes oblong, 3–4 mm, densely strigose. Pappus brownish, 5–6 mm. Fl. Jul–Sep.

Salt marshes, steppes, dry stony slopes; 700–1200 m. N Xinjiang [Kazakhstan, Russia (W Siberia); Europe].


灰毛麻菀 hui mao ma wan


Herbs, perennial, often densely caespitose, 15–35 cm tall, gray tomentose. Stems usually numerous, erect, simple. Leaves oblong to linear-oblong or oblongate, obscurely gland-dotted, base gradually attenuate, apex acute to obtuse, mucronate; upper very reduced. Capitula numerous, in dense corymbiform synflorescences, 8–12 mm. Involucre shortly cylindric or obconic, 6–9 mm; phyllaries sparsely grayish tomentose, glabrescent, subleafy, margin arachnoid ciliolate, outer short, ovate, 1–3-veined, apex obtuse or acute, inner oblong, obtuse, larger, 3–5-veined. Disk florets 5–10, yellow, funnel-shaped, ca. 6.5 mm. Achenes 3–4 mm, densely strigose. Pappus whitish, sometimes brownish tinged, 6–9 mm. Fl. Jul–Sep.

Salt marshes, steppes, stony slopes. N Xinjiang [Kazakhstan, Russia (European part, W Siberia); SW Asia, E Europe (Ukraine)].

紫菀木属 zi wan mu shu
Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Subshrubs; rhizome woody. Stems numerous, erect or ascending, strongly branched, white to gray tomentose or arachnoid or villous to villous or villosulous-to-tomentose. Leaves sessile, small, crowded, subleathery, margin often revolute, 1-veined. Capitula radiate or sometimes discoid, solitary at ends of stems or branches or 3–5 in corymbiform synflorescences. Involucre broadly campanulate or subhemispheric; phyllaries 3- or 4-seriate, imbricate, usually unequal, often apically purple tinged, leathery, margin broad, scarious, erose, whitish, midvein distinct, brownish or reddish, apex acute. Receptacles ± flat, alveolate, irregularly denticulate. Florets fertile. Ray florets female, blue, light violet, or whitish pink; disk florets bisexual, yellow, turning pink, limb funnelform to narrowly campanulate, 5-lobed, lobes lanceolate; anther base obtuse, appendage lanceolate; style branch tips triangular. Achenes oblancoeleoid, ± compressed, 2- or 3-ribbed, ± densely strigose. Pappus white, yellowish, reddish, or dirty white, barbellate, equaling disk corollas, in 3 or 4 series, outermost few, short, thin, outer and inner long, acute, innermost few, ± slightly clavate.

About seven species: C Asia; five species in China.

1a. Leaves 1–2 mm wide, linear or linear-oblong.

2a. Stems branched throughout, densely white or cinnamon villosulous; leaves linear, 10–15(–20) × 1–1.5 mm; capitula usually radiate, sometimes discoid, peduncles slender; phyllary apex greenish or white, rarely purplish

2b. Stems branched in lower part only, gray-white tomentulose; leaves linear-oblong to linear, (8–)12–15 × 1.5–2 mm; capitula radiate, peduncles rather thick; phyllary apex purplish red

1b. Leaves 2–4 mm wide, oblong to oblong-lanceolate or oblong-oblanceolate.

3a. Leaves oblong-oblanceolate, 6–8 × 2–3(–4) mm, apex shortly acuminate; bark at stem base reddish brown

3b. Leaves oblong or oblong-lanceolate to oblong-oblanceolate, 10–25 × 2–4 mm, apex obtuse to ± acute, mucronate; bark at stem base yellow-brown.

4a. Leaves 10–12(–20) mm; phyllaries densely gray-white cottony, apex shortly acuminate to ± obtuse...

4b. Leaves 15–25 mm; phyllaries gray-white tomentulose, apex acuminate


紫菀木 guan mu zi wan mu


Low subshrubs, 8–15 cm, white arachnoid-tomentulose. Stems branched from base, branches slender and short, lower part woody, bark reddish brown, herbaceous above, white arachnoid-tomentose, glabrescent. Leaves oblong-oblanceolate, 6–8 × 2–3(–4) mm, surfaces white arachnoid-tomentose, adaxially apically ± glabrescent, 1-veined, base attenuate, margin often revolute, apex shortly acuminate. Capitula radiate, solitary at ends of stems or in corymbiform synflorescences. Involucre campanulate, 6–7 × 12–13 mm; phyllaries 3-seriate, arachnoid-tomentose, margin broadly scarious, erose fimбриate, apex acute to obtuse, outer short, ovate-lanceolate, mid and inner oblong to oblong-oblanceolate. Ray florets 6–9, lamina spreading, bluish, ca. 8 × 1 mm; disk florets ca. 12, yellow, 5–6 mm, limb funnell-shaped. Achenes ca. 3 mm, densely long strigose. Pappus white, ca. 5 mm.

Sandy and dry lands. Nei Mongol [S Mongolia].


紫菀木 guan mu zi wan mu


Subshrubs, densely leaved. Stems branched throughout, lower part woody, bark tan-colored to gray, upper part herbaceous, gray-green, densely white or cinnamon villosulous, ± glabrescent near base, distally ± densely stipitate glandular. Leaves linear, 10–15(–20) × 1.5–1.5 mm, reduced in size distally, surfaces arachnoid-tomentose, densely so abaxially, sometimes adaxially glabrate, margin strongly revolute. Capitula usually radiate or sometimes discoid, in loose corymbiform synflorescences or solitary at ends of branches, 8–10 mm; peduncles slender, straight or ± curved; bracts small, linear, upper phyllary-like. Involucre campanulate, 5–7 × 8–10 mm; phyllaries 3- or 4-seriate, imbricate, glabrate or sparsely to moderately villous (particularly at base) to arachnoid, ± stipitate glandular, membranous, outer and mid smaller, ovate-lanceolate, inner oblong, margin broadly scarious, glandular and sparsely villous-ciliate or eciliate, apex acuminate, green or white, rarely ± purplish red. Ray florets 7–10, purplish to lavender, tube 2–3.1 mm, tube and lamina base hairy, lamina spreading, 6–10 × 0.8–1.3 mm; disk florets 15–18, 4–5 mm, tube 2–2.2 mm, hairy, limb funnelform, 2.5–3.5 mm. Achenes (2–)3.5–4 mm, sericeous, glandular (not visible at maturity). Pappus yellowish white. Fl. and fr. Jun–Sep.

Gritty-stony foothills, stony riverbeds, sandy or rocky shrubby-grassy deserts; 1000–1600 m. Gansu, Xinjiang [Kazakhstan, Russia].

中亚紫菀木 zhong ya zi wan mu

*Aster alyssoides* Turczanzinow var. *achnolepis* Handel-Mazzetti.

Subshrubs 20–40 cm; rhizome thick. Stems numerous, erect or ascending, many branched in lower part, finely stricate, woody at base, bark reddish brown, gray-white tomentose, ± glabrescent, upper part herbaceous, gray-white villous, ± glabrescent, glandular distally. Leaves crowded, ascending or erect, linear-oblong to linear, (8–)12–15 × 1.5–2 mm, abaxially densely gray-white villous, adaxially gray-green, moderately to sparsely villous, base attenuate, margin revolute, apex acute. Capitula radiate, 8–10 × ca. 10 mm, in loose corymbiform synflorescences or solitary at ends of branches; peduncles rather thick, straight or curved; bracts small, linear. Involucre broadly campanulate, 6–7 × ca. 9 mm; phyllaries 3- or 4-seriate, imbricate, white villous to arachnoid, adaxially ± glabrescent, antherochord, glandular at least distally, margin broadly scarious, erose, acuminate to acute or ± obtuse, usually purplish red, outer short, ovate or lanceolate, inner oblong. Ray florets 7–13, tube ca. 2.9 mm, glabrous, lamina pale purple to pale lilac, 10–12 × 1.2–2.7 mm; disk florets 11–19 (–26), yellow turning reddish, ca. 5 mm, tube 1.8–2.5 mm, tube and limb base sparsely hairy, limb narrowly campanulate to funnelform, ca. 2.7 mm. Achenes straw-colored, 3–3.5 mm, white strigose. Pappus white or pale cinnamon. Fl. and fr. Jul-Sep.

Meadows, gritty-stony foothills, stony riverbeds, open sand dunes, deserts, grasslands; 1300–3400 m. Gansu, Nei Mongol, Ningxia, Qinghai, SE Xinjiang [8 Mongolia].


Grasslands; 1000–1900 m. Xinjiang [Mongolia, Russia (Tuva)].


软叶紫菀木 ruan ye zi wan mu

Subshrubs, (25–)30–40 cm tall. Stems erect or ascending, many branched, woody in lower part, bark yellow-brown, densely gray-white tomentose, ± glabrescent, current-year branches slender, spreading, ascending or ± curved, gray-white arachnoid-lanate. Leaves oblong or oblong-lanceolate, 10–12 (–20) × ca. 3 mm, abaxially white arachnoid-lanate, adaxially shortly arachnoid, ± soft, base cuneate, margin revolute, apex obtuse to ± acute, mucronate. Capitula radiate, large, usually 1–3 in corymbiform synflorescences at ends of branches; peduncle short. Involucre broadly campanulate, ca. 8 × 8 mm; phyllaries 3- or 4-seriate, densely gray-white cottony, margin broadly scarious, erose, ciliate, apex shortly acuminate or ± obtuse, outer shorter, oblong or lanceolate, inner oblong. Ray florets 8, lamina spreading, (whitish pink or pale purple?) yellowish when dry, oblong, ca. 10 × 2.5–3 mm; disk florets 12, yellow, ca. 5 mm, limb narrowly campanulate. Achenes ca. 3.5 mm, moderately to densely strigose. Pappus whitish. Fl. Aug.

Meadows. Nei Mongol [Mongolia].


毛叶紫菀木 mao ye zi wan mu

Subshrubs. Stems erect or ascending, many branched, woody in lower part, bark yellow-brown, herbaceous in upper part, ± densely arachnoid-tomentose, ± glabrescent. Leaves oblong or oblong-lanceolate to oblong-oblanceolate, 15–25 × 4 mm, surfaces gray-white arachnoid-tomentose, adaxially ± glabrescent, midvein conspicuous, margin revolute, apex acute or ± obtuse, mucronate. Capitula radiate, large, in corymbiform synflorescences; peduncle short. Involucr broadly campanulate, 6–7 × 8–9 mm; phyllaries 3-seriate, gray-white tomentose, margined broadly scarious, apex acuminate, purplish at middle and apex, outer short, ovate or ovate-lanceolate, inner lanceolate or oblong. Ray florets 6 or 7, lamina spreading, pale purple, oblong, ca. 8 × 3 mm; disk florets 12–15, yellow becoming ± pale purple, ca. 5 mm, limb funnel-shaped. Achenes 4–4.6 mm, densely strigose. Pappus white or yellowish brown. Fl. Sep. 2n = 18.

Grasslands; 1000–1900 m. Xinjiang [Mongolia, Russia (Tuva)].

128. **ARCTOGERON** Candolle, Prodr. 5: 260. 1836.

莎菀属 suo wan shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Herbs, perennial, mat-forming, scapiform; caudex branched; taproot thick. Leaves linear, base marcescent. Capitula radiate, solitary on scapes. Involucre campanulate; phyllaries 3- or 4-seriate, imbricate, narrowly lanceolate, membranous, acuminate, abaxially rounded, 1-veined, green along vein, often purplish apically, white toward margin, margins scarious, hyaline, erose. Receptacle flat, ± alveolate. Florets fertile. Ray florets white or pinkish white, twice as long as involucre, lamina ovate-oblong; disk florets...
b bisexual, yellow, cylindric-campanulate, 5-lobed, lobes triangular; anther base obtuse, apical appendage lanceolate; style branch tips lanceolate. Achenes oblong, slightly compressed, densely silvery sericeous, slightly veined. Pappus 3- or 4-seriate, of white to yellowish white barbellate bristles, some outer shorter and thinner.

One species: NE China, Mongolia, Russia (Far East).

1. Arctogeron gramineum (Linnaeus) Candolle, Prodr. 5: 261. 1836.

莎菀 suo wan


Herbs, perennial; caudex branches ascending, thickly covered with marcescent leaf bases. Flowering scapes 2–5(or 6), 0.5–1 cm (to 7+ cm in fruit). Leaves erect, linear, 1–10 cm × 0.4–0.6 mm, surfaces glabrous (or sometimes ± arachnoid-pubescent?), rigid, 1-veined, base sheathing, margin recurved, roughly scabrous-ciliate. Capitula solitary on scapes, 1–2 cm in diam. Phyllaries densely villous, inner slightly longer, sometimes pinkish tipped. Ray florets lamina ca. 6 × 2 mm, pale; disk florets 3–6 mm, tube 1–2.5 mm, limb 2–3.5 mm, lobes ca. 0.5 mm. Achenes ca. 3 mm. Pappus inner bristles equaling disk corollas.

Dry mountain slopes or stony slopes. Heilongjiang, Nei Mongol [Kazakhstan, Mongolia, Russia (Far East)].

129. TURCZANINOVIA Candolle, Prodr. 5: 257. 1836.

女菀属 nü wan shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Herbs, perennial; rootstock short and thick. Leaves alternate, linear-lanceolate. Capitula radiate, small, numerous, in dense corymbiform synflorescences. Involucre cylindric-campanulate; phyllaries 3- or 4-seriate, imbricate, shorter than disk florets, membranous, midvein green, margin scarious, apex obtuse to acute. Receptacle alveolate, margin lacerate. Ray florets female, 1-seriate, usually 7–10, white, lamina elliptic; disk florets several, bisexual, partly sterile, corolla yellow, limb shortly campanulate, lobes 5, lanceolate; anther base obtuse; style branch tips lanceolate or sometimes style undeveloped. Achenes dark brownish black or reddish, ovoid, weakly compressed, densely strigose, margins finely 2-ribbed. Pappus 2-seriate, of numerous dirty white, barbellate bristles, thin, subequal.

One species: China, Japan, Korea, Mongolia, Russia (Far East).

1. Turczaninovia fastigiata (Fischer) Candolle, Prodr. 5: 258. 1836.

女菀 nü wan


Herbs, perennial. Stems erect, 30–80(–100) cm tall, glabrous below, sparsely strigose to densely strigose-tomentose upward. Lower leaves withered at anthesis, shortly petiolate, blade linear-lanceolate, 3–12 × 0.3–1.5 cm, abaxially gray-green, densely strigose-tomentulose, densely glandular, 3-veined, veins prominent, adaxially glabrous, base cuneate, margin entire, revolute, scabrous, apex acuminate; mid and upper gradually reduced upward, lanceolate or linear-lanceolate. Capitula small, 5–7 mm, numerous in terminal, dense, corymbiform synflorescences; peduncles slender; bracts 2 or 3, sometimes grading into phyllaries. Involucre cylindric-campanulate or campanulate; phyllaries: outer series oblong, 1–1.5 mm, ± densely puberulent, apex obtuse, inner oblanceolate-oblong, green at apex and along midrib. Ray florets tube 1–2 mm, lamina narrowly oblong to narrowly elliptic, 2.3–3×1.5–1.5 mm; disk florets 3–4 mm, tube 1–1.5 mm, limb 1–3 mm, lobes recurved. Achenes straw-colored to reddish, oblong, ca. 1 mm, densely strigose, glabrescent. Pappus 2–3 mm, equaling or shorter than disk corolla. Fl. and fr. Aug–Oct.

Dry slopes, moist grassy meadows on riverbanks, roadsides; near sea level to 500 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Zhejiang [Japan, Korea, Mongolia, Russia (Far East)].


[“*Lagenifera*”], nom. cons.

瓶头草属 ping tou cao shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Herbs, annual [or perennial], scapiform. Leaves basal [or rarely cauline]. Capitula small, radiate or disciform, solitary, usually pedunculate or on scape, scape bracteate (bracts reduced). Involucre campanulate; phyllaries 2–4-seriate, unequal, membranous, 1-veined (midvein orangish). Receptacles flat or convex, not alveolate, naked. Ray florets female, 1–4-seriate, white to purple; disk florets few, usually sterile, functionally male, yellow, limb campanulate, 4- or 5-lobed; anther base obtuse; style branch tip lanceolate tula small, 5–7 mm, numerous in terminal, dense, corymbiform synflorescences; peduncles slender; bracts 2 or 3, sometimes grading into phyllaries. Involucre cylindric-campanulate or campanulate; phyllaries: outer series oblong, 1–1.5 mm, ± densely puberulent, apex obtuse, inner oblanceolate-oblong, green at apex and along midrib. Ray florets tube 1–2 mm, lamina narrowly oblong to narrowly elliptic, 2.3–3×1.5–1.5 mm; disk florets 3–4 mm, tube 1–1.5 mm, limb 1–3 mm, lobes recurved. Achenes straw-colored to reddish, oblong, ca. 1 mm, densely strigose, glabrescent. Pappus 2–3 mm, equaling or shorter than disk corolla. Fl. and fr. Aug–Oct.

Dry slopes, moist grassy meadows on riverbanks, roadsides; near sea level to 500 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Zhejiang [Japan, Korea, Mongolia, Russia (Far East)].
or triangular. Achenes obovate to oblanceolate, flattened, ± glandular apically, margin 2-ribbed, apex rimmed, shortly beaked or not. Pappus absent.

Eighteen species: SE Asia, Australia, New Zealand, South America; one species in China.


瓶头草  ping tou cao


Herbs, annual, 3.5–12 cm tall. Leaves rosulate, persistent, petiole short, blade obovate to broadly spatulate, 1.2–3 × 0.7–1.3 cm, surfaces sparsely to moderately villosulous, base attenuate, margin repand-dentate, teeth mucronulate, villosulous, apex rounded to obtuse; scape bracts (leaves) 1 or 2, linear, 1–1.5 × 3–5 mm. Capitula 4–7(–9) mm in diam., solitary. Involucre campanulate, ca. 2.5 × 3–5 mm; phyllaries 3- or 4-seriate, margin narrowly scarious, hyaline, entire, apex acute to obtuse, purple tinged, outer oblanceolate, ca. 1 mm, mid oblanceolate or narrowly elliptic, ca. 2 mm, inner linear-oblanceolate. Ray florets 3- or 4-seriate, purplish, lamina linear, 1.5–2.5 × ca. 0.5 mm, enrolled by anthesis; disk florets 1.2–1.5 mm, tube 0.3–0.5 mm, limb shortly funnelform, 0.5–1 mm, 4- or 5-lobed, lobes deltate to triangular. Achenes asymmetrically oblanceolate, flattened, 2.5–3.5 mm, apex and beak glandular. Fl. and fr. Sep.

Forest margins, grasslands on slopes; 1700–1800 m. Fujian, Guangdong, Guangxi, Taiwan [India, Indonesia, Vietnam; Australia].


刺冠菊属  ci guan ju shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Herbs, annual or perennial, or rarely subshrubs. Leaves alternate, entire or ± dissected. Capitula small, radiate or disciform, solitary or in open corymbiform synflorescences, pedunculate or sessile. Involucre hemispheric or broadly campanulate; phyllaries 3-seriate, unequal or subequal, margins scarious. Receptacle convex, not alveolate, naked. Ray florets female, 1- to many seriate, white, pink, violet, or purple; disk florets usually functionally male, limb funnelform, 5-lobed; anthers obtuse, entire; style branches linear, appendages short, obtuse. Achenes of ray florets obovoid to oblong, sometimes compressed, glabrous or strigillose, often winged. Pappus of (1 or)2 to many awns, spreading, spiniform, shortly barbellate, elongating after flowering, sometimes with 2 to many scales, rarely of barbellate bristles or absent.

About 28–30 species: mainly in Australia, few species in SE Asia; one species (endemic) in China.


刺冠菊  ci guan ju

Herbs, annual, 10–15 cm tall; taproot ± woody. Stems erect or ascending, ramified; branches slender, glabrous. Leaves cauline, sessile, blade linear-oblanceolate, 5–25 × 0.5–1.5 mm, gradually reduced distally, surfaces glabrous, base cuneate, margin entire, apex obtuse to acute, tip knobby. Capitula terminal, solitary. Involucre hemispheric, 1–1.5 mm; phyllaries 3-seriate, subequal, linear-oblanceolate, 1–1.5 mm, surfaces glabrous, eglandular, midvein prominent, translucent, margin sparsely ciliate. Ray florets 20–38, 1-seriate, lamina white, 0.9–1.5 × 0.3–0.4 mm, glabrous, eglandular; disk florets yellow, 1.3–1.4 mm, limb 0.8–0.9 mm, lobes erect, triangular, 0.3–0.5 mm, glabrous, eglandular. Achenes (ray) obovoid to oblong, sometimes compressed, glabrous or strigillose, often winged. Pappus of (1 or)2 to many awns, spreading, spiniform, shortly barbellate, elongating after flowering, sometimes with 2 to many scales, rarely of barbellate bristles or absent.

● Dry sandy and grassy areas by sea beaches; near sea level. Hainan.


翠菊属  cui ju shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Callistemma Cassini.

Herbs, annual or biennial. Leaves alternate, cauleine, margin serrate or lobed. Capitula large, radiate, solitary, terminal on stem and at branch ends. Involucre hemispheric; phyllaries 2- or 3-seriate, imbricate, outer series large, leaflike, inner shorter, scarious. Receptacles flat or subconvex, alveolate, short paleae sometimes present. Ray florets 1- or 2-seriate, lamina usually red-purple, entire or shallowly 2-toothed at apex; disk florets bisexual, numerous, yellow, limb campanulate, shallowly 5-lobed; anther base obtuse, entire; style branches flattened, appendages triangular-oblanceolate. Achenes oblanceoloid, slightly compressed, strigillose, sparsely, minutely stipitate glandular, 2-ribbed, 1 vein per side. Pappus 3-seriate, outer of persistent, short scales, inner 2 of deciduous, long, barbellate bristles.

One species: China, Japan, Korea, also widely cultivated.

翠菊 cui ju

Aster chinensis Linnaeus, Sp. Pl. 2: 877. 1753; Callistem- 
ma chinense (Linnaeus) Skeels; C. hortense Cassini; Diplo-
pappus chinensis (Linnaeus) Lessing.

Herbs, 20–100 cm tall. Stems erect, single, simple or 
sparingly branched, branches ascending, sometimes reddish, 
sparingly to moderately villous, sometimes sparsely to mod-
erately minutely stipitate glandular. Leaves: lower withered by 
anthesis or persistent, gradually reduced distally; lower petio-
late (to 1.2 cm), blade spatulate, ca. 0.9 cm; mid narrowly 
winged petiolate (2–4 cm, margin villulosus), blade ovate to 
lanceolate or oblanceolate, 2.5–6.5 × 2–4 cm, strigillose, abax-
ially sparsely pilosulous, midvein sparsely villulosus, adaxially 
glaborous, eglandular, base cuneate or attenuate-rounded, margin 
irregularly, coarsely serrate, teeth mucronulate, sometimes en-
tire (distalmost), apex acuminate, mucronulate. Involucre 10–
15+ mm; phyllaries subequal, oblanceolate, apex obtuse, outer 
series 10–30 × 2–6 mm, glabrous, midvein ciliate proximally, 
margin white ciliate, apex mucronulate, inner series 10–30 × 2– 
6 mm, glabrous, eglandular, scarious, multiveined, veins trans-
lucent, proximally prominent, margin hyaline, erose, purple-
tinged, apex erose. Ray florets 16–40+, lamina red, pink, blue, 
purple, violet, lilac, or white, 15–35 × 2–8 mm, tube sparsely 
strigillose, sparsely, minutely stipitate glandular apically; disk 
florets yellow, 4.5–5 mm, tube and limb base sparsely strigil-
lose, limb 3.6–4 mm, lobes spreading, narrowly triangular, 1.2– 
1.3 mm, sparsely minutely stipitate glandular. Achenes mottled 
purple, grayish with age, 3–3.5 mm. Pappus: outer scales, red-
dish, ca. 0.1 mm, inner bristles white, ca. 4 mm, acute, inner-
most bristles 4.5–4.8 mm, weakly clavate. Fl. and fr. May–Oct.

Grasslands on slopes, stream banks, shady places or open forests, 
routesides; 300–2700 m. Gansu, Hebei, Heilongjiang, Henan, Jiangsu, 
Jilin, Liaoning, Nei Mongol, Shandong, Shanxi, Sichuan, Xinjiang, 
Yunnan [Japan, Korea].

An ornamental plant, this species is widely cultivated worldwide.


复芒菊属 fu mang ju shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Small shrubs. Leaves alternate, petiolate, leathery, pinnatifoliated. Capitula radiate, terminal, in corymbiform synflorescences, 
pedunculate. Involucre cylindric; phyllaries 4-seriate, unequal, oblong or lanceolate-oblong, scarious, green distally. Receptacles flat, 
fimbriate. Ray florets female, 1-seriate, lamina pale yellow; disk florets bisexual, yellow, limb funnelform, 5-lobed; anther base 
sagittate with short, acute auricles at base, apical appendage long acute; style branch tip lanceolate. Achenes obvoid, strigi-
llose, sparsely stipitate glandular, 3-ribbed. Pappus 3-seriate, outermost of 6 broad scales 1.5–2 mm, inner of 0 (disk) or 1 (ray) series of ±
flattened, barbellate bristles ca. 3 mm, innermost of 3–5 strongly clavate bristles 3.8–4.2 mm (equaling base of disk corolla lobes).

● One species: China.


复芒菊 fu mang ju

Shrubs, 30–100 cm tall. Branchlets gray-brown, villulos-
lous, minutely stipitate glandular when young. Leaves narrowly 
winged petiolate (to 0.5–0.8 cm), blade ovate to obovate, 3–5-
lobed, 1.2–2 × 0.5–2 cm, surfaces glabrous, minutely stipitate glandular in pits, viscid, base attenuate, margin irregularly ser-
rate, teeth spinulose, remotely scabridulous. Capitula 2–12, ca. 
7 mm; peduncle 1–10 mm, glabrous, densely stipitate glandu-
lar; bracts sometimes present. Involucre 5–6 mm; phyllaries: base hardened, surfaces glabrous, stipitate glandular, resinous, 
outer lanceolate-oblong, 1.5–2 × ca. 1 mm, distally leaflike, 
margin narrowly scarious, sparsely ciliate, apex acute, inner 
oblong, 3–5.5 × 1.2–1.5 mm, margin broadly scarious, hyaline, 
white ciliate, apex obtuse, tip reddish. Ray florets ca. 10, lamina 
2.5–3 × ca. 0.7 mm; disk florets ca. 8, 4–4.2 mm, limb ca. 3 
mm, lobes spreading, triangular, ca. 0.8 mm. Achenes (imma-
ture) ca. 2 mm.

● Dry rocky slopes, rock walls; ca. 3000 m. W Sichuan (Batang), 
NW Yunnan.

134. HETEROPLEXIS C. C. Chang, Sunyatsenia 3: 266. 1937.

异裂菊属 yi lie ju shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Herbs, perennial, climbing or erect. Leaves alternate, cauline, shortly petiolate, margin entire or serrulate, pinnately veined.

Capitula disciform, solitary or 2–4-fascicled at ends of branches, shortly pedunculate or sessile. Involucre cylindric or cylindric-
campanulate; phyllaries numerous, 5– or 6-seriate, imbricate, ovate to ovate-oblong. Receptacles flat, alveolate, glabrous. Florets 
fertile. Ray florets female, 1-seriate, 4–7, lamina fine, apex 3-toothed; disk florets bisexual, 4–6, yellow, limb narrowly campanulate, 
lobes 5, unequal, outer 2 longer; stamens 5, exserted; anther base obtuse; style branch tip triangular. Achenes oblong or oblong-
obvoid, sparsely strigillose; achenes of ray florets slightly compressed, angled adaxially, slightly convex abaxially, 1-ribbed on both 
sides; achenes of disk florets 2-ribbed on both sides. Pappus 1-seriate, of yellowish white, subequal, barbellate bristles.

● Three species: China.
1. Heteroplexis vernonioides


Herbs climbing. Stems olive, corymbosebranched above, branches spreading, lower to 16 cm, strigate, gray puberulent, glandular. Leaves: petiole 3–5 mm, blade abaxially pale green, adaxially green, lanceolate-elliptic, 8–9 × 2–2.5 cm, surfaces scabrous, abaxially glandular, distal half hard papery, lateral veins distinct, connected toward margin, base cuneate, margin all or above middle sparsely serrulate, densely scabrous, apex acute; upper blade oblong, elliptic-oblong, or narrowly ovate, ca. 2 × 0.9 cm, base cuneate, margin entire, apex acute or slightly obtuse; uppermost subsessile, small. Capitula solitary or 2- or 3-fascicled; peduncles absent or to 6 mm; bracts ovate-lanceolate. Involucre 5–5.6 × 3–4 mm; phyllaries 5- or 6-seriate, outer ovate, obtuse, abaxial surface and margin sparsely pubescent, often glandular. Ray florets ca. 7; disk florets ca. 3, yellow, 4.5–5 mm, lobes incurved, outer 2 ca. 1.6 mm, inner ca. 1 mm. Achenes ca. 1.5 mm. Pappus ca. 4.3 mm. Fl. Oct.

- Limestone rocky sides in valleys. Guangxi (Jinxian).

2. Heteroplexis microcephala


Herbs, erect. Stems gray-brown, simple or branched, striate, densely gray puberulent, eglandular. Leaves: petiole 2–3 mm, blade abaxially pale, adaxially dark green, thickly papery; mid cauline oblong-lanceolate or lanceolate, 5–10 × 1.5–2 cm, surfaces sparsely scabrous, densely glandular, lateral veins 5- or 6-paired, distinct abaxially, base cuneate, margin entire or rarely denticulate, apex acuminate, mucronulate; upper and on branches subsessile, small, ovate-lanceolate. Capitula solitary in leaf axils or 2-4 in racemose-corymbiform synflorescences; peduncles 4–8 mm, densely shortly appressed hairy; bracts 1 or 2 (or 3), linear-lanceolate. Involucre cylindrical or subcylindrical, ca. 4 × 2–3 mm; phyllaries 4- or 5-seriate, scarios, outer ovate, 1–1.5 mm, slightly acute, inner oblong, 4–5 mm, obtuse, inconspicuously 1-veined, apex and margin puberulent. Ray florets 4, tube 2–2.5 mm, lamina fine, ca. 0.5 mm wide, shorter than style; disk florets 4, tube ca. 1.5 mm, glabrous, lobes linear-lanceolate, outer ca. 2 mm, inner 1–1.5 mm, apex puberulent. Achenes oblong, ca. 1 mm. Pappus ca. 4 mm. Fl. Jul–Dec.

- Limestone rocky slopes; ca. 300 m. Guangxi (Yangzhou).

3. Heteroplexis sericophylla


Herbs, erect. Stems gray-brown, simple or branched, striate, densely gray puberulent, eglandular. Leaves: petiole 2–3 mm, blade hard papery; mid cauline lanceolate to oblong-lanceolate, 11–14 × 2–2.5 cm, abaxially gray-green, densely white villous, adaxially green, strigose, lateral veins indistinct, base cuneate, margin entire or above middle ± sparsely serrulate, teeth mucronate, apex acuminate or long acuminate; upper subsessile, narrowly lanceolate, 6.5–10 × 1–1.8 cm, margin entire, apex acuminate; uppermost reduced, linear-lanceolate. Capitula solitary or 2- or 3-fascicled in leaf axils of short branches and in corymbiform synflorescences, shortly pedunculate or sessile; bracts linear-lanceolate. Involucre cylindric-campanulate, 3–4 × ca. 3 mm; phyllaries 5-seriate, obtuse, outer ovate, 1.5–1.8 mm, inner oblong, ca. 4 mm, white villous, margin ciliolate, 1-veined. Ray florets 6 or 7, 1-seriate, lamina fine, ca. 0.5 mm; disk florets 5 or 6, 3.7–4 mm, lobes lanceolate, apex white puberulent. Achenes oblong, ca. 1.3 mm, 2-ribbed on both sides. Pappus ca. 3.5 mm. Fl. Sep–Oct.

- Open forests on hills; ca. 400 m. Guangxi.

135. PSYCHROGETON

Boissier, Fl. Orient. 3: 156. 1875.

寒蓬属 han peng shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Herbs, perennial, annual, or biennial; rhizome usually thickly woody, sometimes thin and ± woody, stem base sheathed in marcescent leaf remains, rarely biennial or annual. Stems usually short, rarely tall, ± scapiform, sometimes branched, leafy. Leaves alternate, basal petiolar or subpetiolar, blade green or grayish, lanceolate, oblanceolate, obovate, or spatulate, white tomentose to lanate, often sessile or short-stipitate glandular, margin entire, coarsely serrate, or sometimes subpinnafrid, cauline leaves few, reduced, entire or dentate. Capitula solitary or few, terminal, rarely in racemiform or corymbiform synflorescences. Involucre campanulate; phyllaries 2- or 3-seriate, imbricate or ± equal, membranous, outer green distally, inner green along midvein, margin scarious. Ray florets fertile, many, white, yellow, or reddish, reduced to tube and elimate or laminate, exceeding or shorter than style, entire or 2- or 3-lobed; disk florets functionally male, few or numerous, concolorous with ray florets, 5-lobed; anther base obtuse, appendages lanceolate; ray floret style linear, disk floret style lanceolate, branches fused. Achenes of ray florets obovoid or
narrowly oblong to oblanceoloid, compressed, ± strigose, marginally 2-ribbed, of disk florets linear, sterile. Pappus 1- or 2-seriate, outer of few short, thin bristles, inner of long, unequal, barbellate bristles, acute or slightly clavate, equaling disk florets.

About 20 species: C and SW Asia; two species in China.

1a. Perennial herbs; stems 3–19 cm tall, simple, sparsely to densely lanate; capitula solitary, 1.5–2.4 cm in diam.; female florets laminate, golden yellow ................................................................. 1. *P. poncinsii*

1b. Annual or biennial herbs; stems to 55 cm tall, branched, densely villous-pilose; capitula numerous, 0.7–1 cm in diam., in corymbose-paniculiform synflorescences; female florets filiform, white ........................................... 2. *P. nigromontanus*


藏寒蓬 zang han peng


Herbs, perennial, 3–19 cm tall; rhizome thickly woody, branched. Stems scapiform, erect or ascending, simple, densely to sparsely lanate, partly glabrescent, sessile or short-stipitate oblanceolate to obovate or spatulate, 1–6 × 0.3–1.5 cm, margin remotely coarsely serrate or slightly resected, rarely entire, apex acute to obtuse; cauline 3–5, sessile or shortly petiolate, blade oblanceolate to linear. Capitula 1.5–2.4 cm in diam., solitary. Phyllaries 2- or 3-seriate, linear-lanceolate to linear-oblong, outer partly green or gray-green, abaxially densely to sparsely white tomentose or lanate, apex acute to acuminate, inner 6.5–8 × ca. 1 mm. Ray florets 4.4–5.4 mm, longer than pappus, tube 2.9–3.6 mm, sparsely hairy, lamina golden yellow, becoming reddish or purplish after anthesis, narrowly obovate to oblanceolate, 1.3–3.5 × 0.7–1.2 mm, apex 3-denticulate; disk florets narrowly funnelform, appressed hairy, tube 1.7–1.8 mm, limb 3.3–3.5 mm, lobes 0.3–0.5 mm. Achenes (ray florets) brown, ribs straw-colored, narrowly oblong to oblanceolate, 3.6–3.8 mm, ± densely striigose. Pappus 2-seriate, yellowish white, 2.6–4.6 mm.

Valleys; 3000–4600 m. Xinjiang, W Xizang [Afghanistan, India, Pakistan, Russia, Tajikistan; SW Asia (Iran)].


黑山寒蓬 he shan han peng


Herbs, annual or biennial, 1–55 cm tall or more; taproots vertical or ascending. Stems erect, branched above, densely leafy, grayish, densely villous-pilose, short-stipitate glandular. Leaves densely villous-pilose, short-stipitate glandular, basal withered at anthesis, petiolar, petiole base clasping, blade spatulate to oblong; lower cauleine long petiolar, blade obovate to oblanceolate, ca. 8 × 2.5 cm, base attenuate, margin entire or remotely serrulate, apex acute; mid cauleine blade oblanceolate to lanceolate, ca. 3 × 0.75 cm, margin entire or remotely 1- or 2-serrulate per side; upper on branches reduced. Capitula 0.7–1 cm wide, usually numerous, in corymbose-paniculiform synflorescences; peduncles thin, 0.5–1 cm. Involucre campanulate; phyllaries subequal, 2- or 3-seriate, green along midvein, lanceolate to linear, ca. 4 × 0.5 mm, abaxially densely villous-pilose, short-stipitate glandular, margin scarios, apex acuminate. Female florets numerous, filiform, 1.75–2 mm, hairy, lamina ± obliquely cut; disk florets 6–12, ca. 3.5 mm, funnelform, lobes lanceolate, apex hairy. Achenes brown, oblanceoloid, ca. 2 × 0.5 mm, strigose. Pappus 1-seriate, sometimes also short outer series present, very short, of 20–24 barbellate bristles, 3–4.5 mm. Fl. Jul.–Sep.

Subalpine meadows; 1200–1500 m. X Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan; SW Asia (Caucasus, Iran, Iraq, Turkey)].

136. NEOBRACHYACTIS Brouillet, gen. nov.

短星菊属 duan xing ju shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Type: *Neobrachyactis roylei* (Candolle) Brouillet.

*Herbae annuae vel perennes, stipitato-glandulosae; caules erecti vel ascendentes, simplices vel ramosi. Folia alterna, basalia et caulina, ad marginalem serrata vel interdum integra. Capitula disciformia vel radiata, in synflorescentias racemico-paniculiformes disposita, raro ad foliorum superum axillarum solitaria vel aggregata; involucrum hemisphaericum vel campanulatum; phyllaria 2- ad 4-seriata, subaequalia, lineari-lanceolata vel lineari-oblonga, membranacea vel externa foliacea, ad marginalem scariosa, glandulosa; receptaculum planum, in infrime alveolatum, nudum. Flosculi omnes fertiles; flosculi radii feminei, numerosi, biseriati, tubulosi vel breviter laminati, albi vel caerulescentes; flosculi disci biseriati, minus numerosi, lutei vel incolorati, limbo breviter infundibuliformi, superne 5-lobo, lobis ovatis, antheris ad basin obtusatae, appendice apicali lanceolata, styli ramorum appendicibus triangulo-lanceolata. Achaenia oblancale, compressa, strigosa, ad marginalem 2-costata; pappus biseriatus, setis exterioribus paucibus, brevibus, gracilibus, interioribus numerosis, luteis usque cinnamomeis, barbellatis, ad apicem acutum interdum leniter clavatis.*
Herbs, annual or perennial. Stems erect to ascending or sometimes procumbent, often branching from base, stipitate glandular. Leaves basal and cauline, blade obovate to oblong-ovate or oblone-lanceolate, margin serrate or sometimes entire, ± densely glandular. Capitula radiate or disciform, in racemose-paniculiform synflorescences, rarely solitary or crowded in upper leaf axils. Involucrifer hemispheric or campanulate; phyllaries 2–4-seriate, subequal, membranous, outer leaflike, linear-oblong or linear-lanceolate, stipitate glandular, margins villous-ciliate, outer green except white margin, margin of inner narrowly scarious, erose, ± ciliate. Receptacles flat, weakly alveolate, glabrous. Florets fertile. Ray florets numerous, 2-seriate, white or bluish, reduced to tube or shortly laminate, tube shorter than style, apex ciliate, lamina, if present, filiform, exceeding style; disk florets bisexual, less numerous, yellow or uncolored, shorter than to ± equaling pappus, limb shortly funnelform, 5-lobed, lobes ovate, short; anther base obtuse, apical appendage lanceolate; style branch tips triangular-lanceolate. Achenes oblong-lanceolate, flattened, long strigose, marginally 2-ribbed. Pappus 2-seriate, outer of few short, thin bristles, inner of numerous yellowish to cinnamon, barbellate bristles, apex acute or sometimes slightly clavate.

Three species: C. N., and S. Asia; three species in China.

The genus Neobrachyactis is distinct from Brachyactis s.s., the type of which, B. ciliatus (Ledebour) Ledebour (Eriogonon ciliatum Ledebour), belongs to the North American genus Symphyotrichum. The notably glandular herbage and the compressed, 2-ribbed achenes clearly distinguish the species of Neobrachyactis from S. ciliatum.

1a. Perennial herbs; upper leaves sessile, subclasping at base, shortly decurrent on stems; capitula solitary or 3 or 4 crowded at ends of stems and branches; phyllaries longer than disk florets; ray florets longer than disk florets, lamina bluish, exceeding style ........................................................................................................................................ 1. N. anomal

1b. Annual herbs; upper leaves sessile or shortly petiolate, not decurrent; capitula ± numerous, in racemiform or racemose-paniculiform synflorescences; phyllaries shorter than disk florets; ray florets shorter than disk florets, lamina white, shorter than style, or tube apex obliquely lobed, elimate.

2a. Stems moderately to densely stipitate glandular and sparsely villous; capitula 1–1.2 cm in diam., numerous, in racemiform or racemose-paniculiform synflorescences; phyllaries green, ca. 1/3 shorter than disk florets, outer shorter than inner, ± villous and densely short-stipitate glandular .............................................. 2. N. roylei

2b. Stems densely brown glandular; capitula 1.5–2 cm in diam., few, in racemiform synflorescences; phyllaries dark brown, slightly shorter than disk florets, outer often longer than inner, densely brown glandular ........................................................................................................................................ 3. N. pubescens

1. Neobrachyactis anomal (Candolle) Brouillet, comb. nov. 香短星菊 xiang duan xing ju

Basionym: Eriogonum anomalum Candolle, Prodr. 5: 293. 1836 ['anomalum']; Aster menthodorus (Bentham) Govaerts; Brachyactis anomal (Candolle) Kitamura; B. indica C. B. Clarke; B. menthodora Bentham.

Herbs, perennial, 60–95 cm tall, with sweet menthol odor. Stems erect, rigid, tinged pinkish violet, shortly branched, long-stipitate glandular. Leaves crowded, surfaces densely stipitate glandular, veins sparsely villous; basal and lower cauline long petiolate, basal fallen at anthesis, obovate or oblong-lanceolate, 1.5–5 × 0.5–1.5 cm, margin serrate, apex acute or arcuate; upper sessile, gradually reduced, base subclasping, decurrent, ± rounded. Capitula radiate, solitary or 3 or 4 crowded at ends of stems or branches, 1–1.5 cm in diam.; peduncles 5–10 mm. Involucrifer hemispheric-campanulate; phyllaries 2- or 3-seriate, membranous, outer often 1 or 2, leaflike, green along midvein, inner linear or linear-lanceolate, 6–7 mm, sparsely villous, sparsely stipitate glandular, margin narrowly scarious, apex acute or acuminate, pinkish violae, equaling or longer than disk florets. Florets fertile. Ray florets numerous, ± 2-seriate, 5–6 mm, lamina bluish, longer than style, narrow, apex 3-toothed; disk florets ca. 5 mm, tube and limb base often hairy, limb funnelform, lobes lanceolate, glabrous. Achenes brown, oblong-lanceolate, compressed, 3–3.5 mm, sparsely strigose. Pappus pinkish to brownish, 2-seriate, outer bristles short, inner unequal, longer than achen, barbellate. Fl. and fr. May–Sep.

Alpine thicket margins, grasslands on slopes; 3300–4000 m. S. Xizang (Nyalam to Yadong) [Bhutan, India, Nepal].

2. Neobrachyactis roylei (Candolle) Brouillet, comb. nov. 西疆短星菊 xi jiang duan xing ju

Basionym: Conyza roylei Candolle, Prodr. 5: 381. 1836; Brachyactis roylei (Candolle) Wendelbo; B. umbrosa (Karelin & Kirilov) Bentham; C. umbrosa Karelin & Kirilov; Eriogonum umbrosus (Karelin & Kirilov) Boissier.

Herbs, annual, 3–35 cm tall. Stems erect or ascending, sometimes procumbent, green or tinged pinkish, branched from base or upper part, densely leafy, densely stipitate glandular, densely hirsute-villous. Leaves: surfaces densely stipitate glandular, hirsute-villous; basal withered and fallen at anthesis, long petiolate; blade obovate or obovate-oblong, 0.5–4 × 0.3–1.5 cm, base cuneate to attenuate, margin coarsely serrate, apex obtuse or arched; cauline short-stipitate, blade obovate, base attenuate to cuneate; upper reduced, margin coarsely serrate or subentire. Capitula numerous, in racemiform or racemose-paniculiform synflorescences, 1–1.2 cm in diam. Involucrifer campanulate; phyllaries 3- or 4-seriate, membranous, linear-lanceolate, shorter than or equaling disk florets, abaxially densely stipitate glandular, sparsely villous, margin narrowly scarious, outer shorter than inner, 5–7 × 0.6–1 mm. Ray florets numerous, reduced to tube, white, 2.2–2.6 mm, sparsely hairy above, apex oblique, ciliate, or sometimes laminate; disk florets yellow, 3.5–3.6 mm, tube 2.4–2.8 mm, limb shortly funnelform, upper tube and limb hairy, lobes ovate, 0.25–0.4 mm. Achenes lanceolate, compressed, 1.8–2.2 mm, strigose. Pappus yellowish to cinnamon, 2-seriate, 3.6–3.9 mm, inner ± equaling disk corolla. Fl. and fr. Jul–Sep.
3. Neobrachyactis pubescens (Candolle) Brouillet, comb. nov.

Basionym: *Conyza pubescens* Candolle, Prodr. 5: 381. 1836; *Brachyactis pubescens* (Candolle) Aitchison & C. B. Clarke; *B. robusta* Bentham.

Herbs, annual, 4–20 cm tall. Stems erect or ascending, branched, densely leafy, densely brownish yellow stipitate glan- dular. Leaves: surfaces densely glandular, basal withered and fallen at anthesis, shortly petiolate, blade obovate or oblong-obovate, 1–4 × 0.5–1.5 cm, base cuneate, margin sparsely


虾须草属 *xia xu cao shu*

Chen Yousheng (陈又生); Luc Brouillet

Herbs, biennial (or winter annual). Stems erect to ascending. Leaves basal 1st year, cauline 2nd year, alternate, margin entire. Capitula radiate, small, terminal or axillary. Involucre broadly campanulate or subhemispheric; phyllaries 3- or 4-seri- ate, imbricate, green distally, becoming yellow-green, surface tapering, triangular, ca. 0.4 mm, tube, limb, and lobe base glabrous, minutely stipitate glandular. Achenes oblan- cecoid to obovoid, 1–4 × 0.5–1.5 cm, base cuneate, margin sparsely


岩菀属 *yan wan shu*

Chen Yi-ling (陈艺林); Luc Brouillet


Herbs, perennial, caespitose; rhizomes thick, woody, caudices many branched, clad with marcescent petiole bases. Stems erect, branched or simple, densely curved-stribose. Leaves: basal numerous, petiolute, blade obovate, obovate-oblong, or oblong-obovate, 3-veined, margin entire or sparsely serrate, base attenuate, cauleine shortly petiolute or sessile, obovate-oblong or obovate-oblong, rarely linear, densely curved-stribose, sessile glandular. Capitula radius, solitary at ends of branches or several in racemiform synflores- cences. Involucre broadly campanulate or subhemispheric; phyllaries 3- or 4-seriate, imbricate, green distally, becoming yellow-brown, obovate-oblong or oblong-lanceolate, sparsely stricode, subulate, back rounded, margin scarious, sometimes ciliate, apex obtuse or ± acute, outer shorter. Receptacles slightly convex, irregularly, shallowly alveolate, naked. Florets numerous, fertile. Ray florets pale purple, 2 × longer than disk florets; disk florets bisexual, numerous, yellow or purplish, ± zygomorphic, upper tube and limb base hairy, limb

Herbs, perennial, subcapitiform. Stems several, ascending, 1.5–2 cm in diam. Involucres hemispheric or broadly campanulate, 5–6 × 10 mm; phyllaries 3-seriate, ± leathery, margin narrowly scarious, erose to fimbriate, sometimes ciliate, apex acuminated, outer shorter, lanceolate, sparsely scabrous, mid and inner oblong or glabrous in lower half. Ray florets lamina light violet, 13–15 × ca. 2 mm; disk florets yellow, 4.5–6 mm, lobes lanceolate. Achenes ca. 4 mm, densely strigose.

Rocky or grassy slopes; 1200–3500 m. NW and W Xizang [Kazakhstan, Mongolia, Russia (W Siberia), Uzbekistan].


Herbs, perennial, capitiform. Stems several, simple, 3–8(–10) cm, densely strigose. Leaves: basal many, rostrate, petiole equaling blade or shorter, base expanded, blade spathulate to ovate or obovate, 2.5–4.5 × 1–2 cm, surfaces strigose, usually 1-veined, rarely inconspicuously 3-veined, base attenuate, clasping, margin entire or sparsely serrulate, apex acute or ± obtuse, rarely rounded; cauline few, shortly petiolate or sessile, blade narrowly oblong or oblanceolate to lanceolate-linear, base cuneate, apex acute to obtuse. Capitula solitary at ends of stems or branches, 1.5–2 cm in diam. Involucres subhemispheric to broadly campanulate, 5–6 × ca. 10 mm; phyllaries 3-seriate, leathery, margin narrowly scarious, erose, sometimes ciliate, apex acuminated, outer shorter, lanceolate, ± densely strigose, mid and inner oblong, strigose or almost glabrous in lower half. Ray florets lamina light violet, 13–15 × ca. 2 mm; disk florets yellow, 4.5–5.5 mm, lobes lanceolate. Achenes ca. 4 mm, densely strigose.

Herbs; 1800–2700 m. C and N Xinjiang [Kazakhstan, Mongolia, Russia (Altai, W Siberia)].

Thus delimitation is supported by recent molecular phylogenetic analyses of tribe Astereae, summarized in Brouillet et al. (in Funk et al., Syst. Evol. Biogeogr. Compositae, 589–629. 2009). Other genera that might probably be considered part of *Aster* are *Sheareria*, which Gao et al. (Taxon 58: 769–780. 2009) placed close to *Kalimeris* and *Heteropappus* but those were placed within the *Aster* complex as described here in a more recent analysis of Iranian Astereae involving more members of the genus (F. Jafari, pers. comm.), and *Rhinaclinitida*, a possible sister of *A. sect. Pseudocalimeris* (F. Jafari, pers. comm.). This last relationship would be supported by the fact that these two groups share unequal disk corolla lobes, a rare feature in the tribe. Other genera may be involved here, but this is still unclear. The current concept excludes African *Aster* species, which belong to a distinct, African clade (Brouillet et al., loc. cit. 2009).

An alternate classification that would retain all segregate genera as distinct would recognize *Heteropappus*, *Kalimeris*, *Rhinactinidia* (though one could defend including them in *Heteropappus*), *Sheareria*, and *Aster* s.s. (still including *Myayamayomena* and *Rhyncospermum*) and would impose the creation of new genera for *A. sect. Teretiachaenium* and *A. sect. Ageraoides* (unless one prefers a strongly paraphyletic, not say polyphyletic, *Aster*).

Nesom (loc. cit.) underlined the distinction of the shrubby species of *Aster* *s.s. Albescentes* Y. Ling, noting their isolation among Old World *Aster* species. He concluded that the segregation of the series at generic rank would be justifiable. Two of us (Brouillet and Semple) agree with this hypothesis, but, currently, phylogenetic data are insufficient to place this group within the phylogeny of the tribe Astereae. Therefore, we treat it here as an incertae sedis group within *Aster* for the time being. One of us (Chen) considers that *A. sect. Albescentes* should be recognized as a section; however, the combination at that rank is not formally proposed here because not all the present authors agree.

*Aster filipes* J. Q. Fu (Bull. Bot. Res., Harbin 3(1): 118. 1983), described from Gansu, and *A. langaoensis* J. Q. Fu (loc. cit.), described from Shaanxi, could not be treated here because no material was seen by the present authors.

1a. Shrubs, many branched; leaves cauline, margins revolute or flat; phyllaries keeled ................................................................. 1. Incertae sedis group

1b. Herbs perennial, rarely annual or biennial, sometimes subshrubs (rarely becoming shrubs), simple or ± branched; leaves basal (withered or present at anthesis) and cauline (sometimes reduced), margins flat; phyllaries usually not keeled.

2a. Ray florets 5–9, white; achenes obovoid, terete or slightly compressed ........................................... 2.

2b. Ray florets 10–40, white, pink, blue, or purple; achenes obovoid, oblong, or oblanceoloid, compressed or flattened, sometimes 3- or 4-angled.

3a. Leaves 3-veined basally or below middle, margins coarsely serrate to serrate, sometimes serrulate; capitula campanulate; pappus of numerous bristles, outer series of short bristles .................................................. 3. *A. sect. Ageraoides*

3b. Leaves usually 1-veined, margins entire, serrate, or dentate, sometimes pinnatifid or pinnatilobate; capitula hemispheric, campanulate, obconic, or cylindric; pappus of few to many bristles, inner bristles sometimes absent, outer series of short bristles or scales, sometimes pappus absent.

4a. Pappus 1-seriate, of few (outer) short bristles or scales, persistent or deciduous, sometimes absent; achenes compressed or sometimes triangular; leaf margins entire, dentate, or serrate, or pinnatifid or pinnatilobate ................................................................. 4. *A. sect. Asteromoea*

4b. Pappus 1–4-seriate, usually of few to numerous long bristles and outer short bristles or scales, rarely deciduous or absent; achenes compressed; leaf margins entire, crenate, or serrate.

5a. Disk corolla lobes unequal (1 lobe more deeply cut); herbs perennial, biennial, or annual; synflorescences corymbose-paniculiform or solitary at ends of branches; achenes compressed or flattened; ray pappus of few short bristles or scales, sometimes absent, disk pappus present, of long bristles and outer short bristles or scales ................................................................. 5. *A. sect. Pseudocalimeris*

5b. Disk corolla lobes equal; herbs perennial; synflorescences corymboseform or solitary at ends of stems, rarely solitary at ends of branches; achenes ± compressed, sometimes 3- or 4-angled; ray and disk pappus present, sometimes absent in both or deciduous, outer series of short bristles, rarely of scales.

6a. Basal leaves usually withered at anthesis, cauline leaves developed; capitula corymboseform, numerous, rarely few, rarely solitary at ends of branches or in axils, rarely terminal; phyllaries unequal, sometimes subequal, membranous, upper part sometimes leaflike; herbs erect, sometimes branched, sometimes subshrubs ......................... 6. *A. sect. Aster*

6b. Basal leaves persistent at anthesis, usually in rosette, caulescent reduced; capitula solitary, terminal, or 2 or 3 in corymbose synflorescences; phyllaries subequal, leaflike or upper part leaflike; herbs usually scapiform .................................................. 7. *A. sect. Alpigeni*

横斜紫菀 heng xie zi wan

Shrubs, 60–120 cm tall. Stems many branched; old branches erect, procumbent or ascending, many branched. Leaves cauline; blade ovate, ovate-lanceolate, elliptic, or oblanceolate to oblanceolate, 1- or 3-veined, margin revolute or flat, entire or minutely to coarsely serrate. Capitula radiate, terminal or axillary on short branches, in corymbiform synflorescences or solitary at ends of stems or branches. Involucres campanulate; phyllaries 3-5-seriate, unequal, membranous or subleathery, tip sometimes leaflike, keeled, margin narrowly scarious. Receptacles flat or convex. Ray florets 1-seriate, 10–30, white, pink, or purple; disk floret limb narrowly campanulate, lobes equal. Achenes obovoid, oblone, or oblong-cylindric, ± compressed, 2–8-veined or -ribbed. Pappus of ray and disk florets 3-seriate, of numerous persistent, free bristles, innermost series clavate, outermost series of short bristles or scales.

Eight species: Asia; eight species (seven endemic) in China.

1a. Capitula on short axillary branches.
   2a. Capitula 3–10, in corymbiform synflorescences; leaves ovate to elliptic-lanceolate, triplinerved .......................... 2. A. nitidus
   2b. Capitula solitary at ends of second-year axillary branches; leaves oblanceolate, pinnately veined ........................ 1. A. hersileoides
1b. Capitula terminal at ends of stems and lateral branches.
   3a. Leaves linear .......................................................................................................................................................... 8. A. lavandulifolius
   3b. Leaves ovate, ovate-lanceolate, elliptic, oblong-oblong-lanceolate, or oblanceolate.
      4a. Capitula in corymbiform synflorescences or solitary at ends of lateral branches.
         5a. Leaves adaxially arachnoid or glabrate, abaxially white tomentose, margin entire or 1- or 2-serrate-spineose; capitula 1–3 on branches ................................................................. 6. A. hypoleucus
         5b. Leaves adaxially verruculose, abaxially with white arachnoid hairs, margin entire; capitula 3–20 in corymbiform synflorescences ........................................................................................................................ 7. A. polius
      4b. Capitula in terminal compound corymbiform synflorescences.
         6a. Pappus straw-colored, sometimes purplish; leaf margin entire or remotely serrulate to coarsely serrate, adaxial surface eglandular or rarely sparsely glandular .......................................................... 3. A. albescens
         6b. Pappus dirty white; leaf margin entire, adaxial surface ± glandular.
            7a. Leaves (4–)6–9 cm, both surfaces sparsely strigillose, glabrate, or glabrous, abaxially glossy between minor veins .................................................................................................................. 4. A. fulgidulus
            7b. Leaves 1–4 cm, adaxially moderately scabridulous, abaxially gray-white arachnoid-tomentose or cottony ............................................................... 5. A. argyropholis


横斜紫菀 heng xie zi wan

Shrubs, 60–120 cm tall. Stems many branched; old branches erect, procumbent or ascending, bark gray-brown, branched, striate; second-year branches yellow-brown, leaf scars and axillary buds prominent; current-year branches densely leafy, purple-red, slender, young branches hairy in decurrent lines below leaves. Leaves sessile, green, oblanceolate, 1–3 × 0.2–0.7 cm, thin, glabrous except midvein hairy; more densely so adaxially, midvein abaxially prominent, venation pinnate, base attenuate, margin entire, flat, strigose-ciliolate, apex obtuse or rounded to acute, mucronulate. Capitula at ends of second-year axillary branches, solitary, 2.5–3 cm in diam.; peduncles slender, 4–5.5 cm, distally hairy, subtended by small leaves; bracts scattered, linear. Involucres campanulate, 5–6 mm; phyllaries 3-seriate, unequal, distally green, linear-lanceolate, midvein distally swollen and translucent, apex acuminate; outer series of phyllaries 2–3 × ca. 0.6 mm, margin narrowly scarious, glabrous or sparsely hairy; inner 2 series of phyllaries subequal, 4–5.5 × ca. 1 mm, margin scarious, erose, ciliate, sometimes tips purplish, midvein translucent, dark bordered. Ray florets 25–30, green-purple, lamina 9–10 × 2–2.5 mm, glabrous, eglandular; disk florets yellow, ca. 5 mm, limb narrowly campanulate, ca. 3.5 mm, proximally sparsely hairy, eglandular, lobes spreading to recurved, triangular, ca. 1 mm. Achenes obovoid, 2–3 mm, densely trigillose, 2–4-veined, veins concolorous. Pappus 3-seriate, white; outer bristles slender, 0.5–1 mm; inner bristles unequal, 3.5–4 mm, acute or innermost ± clavate. Fl. and fr. Apr–Jul.

● Dry slopes on hills, rocky walls; 1300–2800 m. W Sichuan (Maowen).


亮叶紫菀 liang ye zi wan

Shrubs, 50–150 cm tall. Stems many branched; old branches ascending, bark reddish- to gray-brown, branched, striate; second- and third-year branches purple-brown or ferruginous, leaf scars and axillary buds prominent; current-year branches densely leafy, reddish, moderately strigose. Leaves gradually smaller distally, shortly petiolate (petiole 1.5–3 mm); blade dark green, shiny (more so adaxially), ovate to elliptic-lanceolate, 2.5–7 × 0.5–1.6 cm, subleathery, glabrous except adaxial veins hispidulous proximally, midvein abaxially prominent, triplinerved, base cuneate, margin revolute, entire, strigose-ciliolate, apex acute, mucronulate. Capitula at ends of second-year axillary branches, 3–10 in corymbiform synflorescences, 2.5–3 cm in diam.; peduncles slender, 2.5–4 cm, with small basal leaves and scattered, linear bracts, strigose (dark crosswalls), distally denser. Involucres campanulate, 6–7 × 7–8 mm; phyllaries 3-seriate, unequal, linear-lanceolate, midvein
Microglossa cabulicum (Lindley) C. B. Clarke; Homostylium cabulicum (Lindley) Nees; Microglossa bulbica (Lindley) C. B. Clarke; M. griffithii C. B. Clarke; M. salicifolia Diels.

Leaf blade narrowly to broadly lanceolate, 5–12 × 1–12.5 cm, abaxially gray-white appressed tomentulose, margin flat, entire. Outer phyllaries ovate, abaxial surface sparsely hairy or glabrate.

500–3000 m. Gansu, Guizhou, W Hubei, S Sichuan, E and N Xizang, NW Yunnan [S and W Himalayan region].

This variety is common.


Leaves elliptic-lanceolate, 2.3–5 × 0.5–1 cm, abaxially white appressed tomentulose, adaxially glabrous. Outer phyllaries ovate, puberulent or glabrate.

About 2400 m. Sichuan (Songpan).

This variety is similar to Aster argyropholis. It may be intermediate between A. argyropholis and A. polius.


Leaves narrowly to broadly lanceolate, 5–12 cm, both surfaces glabrous, sometimes young leaves abaxially sparsely tomentose on midvein only. Outer phyllaries ovate to lanceolate, glabrous.

About 800–3000 m. Hubei, W Sichuan, N Yunnan.

The leaves are similar in shape to those of Aster albescens var. albescens but are often shorter and narrower.


**ASTERAEAE**


*Aster hypoleucus* bai bei zi wan

Shrubs, ca. 15 cm tall; stems fascicled. Stems numerous, densely branched; current-year branches simple or divaricately branched, erect, slender, strict, angled, white tomentose, densely leafy, terminal branches and peduncles hard and persistent by anthesis. Leaves suberect, shortly petiolate; blade adaxially dark green, elliptic or oblongate, 5–15 × 2–3.5 mm, leathery, abaxially white tomentose, adaxially arachnoid or glabrate, base attenuate, margin strongly revolute, entire or 1- or 2-serial-spinose, apex acute or obtuse, spinose. Capitula 1–3 terminal on lateral branches; peduncles 2–3 cm; bracts minute, linear-lanceolate, membranous. Involucres campanulate, 4–5 mm in diam.; phyllaries 4-seriate, imbricate, subaleathry, apex reddish purple; outer phyllaries lanceolate-ovate, short, apex acute; inner phyllaries linear-lanceolate, ca. 5 × 0.6 mm, 4–5 × as long as outer phyllaries, margin narrowly scarious, erose, villosulous-ciliate. Ray florets ca. 13, white when dry, tube ca. 2.2 mm, hairy, lamina ca. 4.5 × 1 mm; disk florets yellow, ca. 3.8 mm, tube 1–1.1 mm, limb narrowly funnelform, tube and limb base hairy, lobes lanceolate, ca. 1 mm, glabrous. Achenes tan, narrowly obovoid, slightly compressed, trigonous, ca. 1.6 mm (immature), silky, pale 3-ribbed. Pappus 3-seriate, whitish; outermost bristles ca. 0.5 mm; outer bristles slender, ca. 1.2 mm; inner bristles acute, 2.5–3.5 mm. Fl. Jul.

- 3000–3700 m. S Xizang (Zangbo valley).


*灰毛紫菀* hui mao zi wan

Shrubs, 0.6–1.2 m tall. Stems erect, multibranched; old branches erect, bark grayish brown, branched, striate; current- and second-year branches red-purple, leaf scars and axillary buds prominent, moderately to densely curly hairy, glabrescent. Leaves petiolate (petiole 1–2 mm); blade adaxially green, narrowly ovate to elliptic, 1.5–3.5 × 0.6–1.4 cm, subleathery, abaxially white tomentose, distally transulcent, apex acute or obtuse, pubescent; outer phyllaries ovate, ca. 1 mm, margin narrowly scarious, erose, ciliate; inner phyllaries unequal, lanceolate, 3–4 × ca. 1 mm, margin scarious, erose, sometimes ciliate. Ray florets 8–10, white, tinged red, tube sparsely hairy, lamina 4–5 × ca. 1.5 mm, glabrous, eglandular; disk florets yellow, ca. 3.5 mm, limb narrowly campanulate, 1.5–2 mm, sparsely minutely hairy basally, eglandular, lobes spreading or recurved, narrowly triangular, 1–1.2 mm. Achenes obovoid, (immature) ca. 2 mm, sparsely stipitate, finely ciliate; outer series of scales 0.5–0.7 mm; inner bristles ca. 2.5 mm, acute; innermost bristles 3–3.5 mm, clavate. Fl. Jul.

- Open shrubs; 2000–2700 m. W Sichuan (Maowen, Xiaojin).

5a. *Aster argyropholis* var. *argyropholis*

*原变种* yin lin zi wan (yuan bian zhong)

Leaves abaxially densely tomentose, secondary veins abaxially not prominent, apex acute or abruptly acute, rarely rounded. Peduncles densely white cottony. Involucres campanulate, 4–6 mm; phyllaries 4- or 5-seriate, unequal; outer phyllaries broadly lanceolate, 1.5–2 × ca. 0.5 mm, abaxially sparsely tomentulose proximally to glabrate, margin narrowly scarious, erose, ciliate, apex acute, green or purple-red. Ray florets 15–20, white, tube sparsely hairy, lamina ca. 4 × 1.5 mm, glabrous, eglandular; disk florets yellow, 4.5–5 mm, tube sparsely hairy distally, limb narrowly campanulate, ca. 2.5 mm, sparsely glandular, lobes reflexed, triangular, 1–1.2 mm. Achenes reddish brown, cylindrical, 2–2.7 mm (?immature), strigillose, translucent 6-veined. Pappus 3-seriate, dirty white; outer bristles few, slender, 0.3–0.6 mm; inner bristles ca. 2.5 mm, acute; innermost bristles ca. 4.5 mm, clavate. Fl. May–Oct, fr. Aug–Oct.

- *NC* Sichuan (Barkam).

5b. *Aster argyropholis* var. *niveus*

*白雪紫菀* bai xue yin lin zi wan

Leaves abaxially densely white cottony, secondary veins abaxially not prominent, apex acute or abruptly acute, rarely rounded. Peduncles densely white cottony. Involucres 4–5 mm; phyllaries 4-seriate, secondary veins abaxially not prominent. 2a. Leaf apex acute or abruptly acute, rarely rounded, abaxial surface and peduncles densely tomentose ......................... 5a. *Aster argyropholis*

2b. Leaf apex obtuse or rounded, abaxial surface and peduncles densely white cottony ..................... 5b. var. *niveus*

459. 1917 ["polia"].

5c. Aster argyropholis var. paradoxus

*奇形银鳞紫菀* qi xing yin lin zi wan

Leaves abaxially sparsely tomentose, secondary veins abaxially prominent. Involucrle 5–6 mm; phyllaries 5-seriate.

- *NC* Sichuan (Barkam).

459. 1917 ["polia"].

线叶紫菀 xian ye zi wan

Shrubs, 60–100 cm tall. Stems multibranched, old branches ascending, bark brown, branched, shallowly striate, leaf scars and axillary buds prominent; current-year branches slender, yellow-brown, densely leafy, white tomentose. Leaves sessile, adaxially green, abaxially gray-white tomentose, adaxially rugose, very sparsely scabrous, resinous, midvein pronounced, venation pinnate, base long cuneate, margin entire, strongly recurved, apex acute, mucronulate; upper leaves smaller. Capitula 3–50 or more in dense corymbiform synflorescences, terminal on current-year branches or 3–5 at ends of lateral branches, ca. 8 mm in diam.; peduncles slender, 2–6 mm, tomentulose; bracts subulate. Involucres narrowly campanulate, 5–6 mm; phyllaries 4–5-seriate, unequal; outer phyllaries ovate, 1–2 mm, sparsely tomentose, resinous, margin narrowly scarious, keeled, midvein apically swollen, translucent, apex acute; inner phyllaries lanceolate, 4–5 × 0.7–0.9 mm, margin narrowly scarious, erose, ciliate, midvein apically very swollen, apex obtuse to acute. Ray florets 5–7, white, tube sparsely hairy distally, lamina 2.5–3 × 0.5–0.8 mm, glabrous, eglandular; disk florets yellow, 3.5–4 mm, limb narrowly campanulate, ca. 3 mm, very sparsely hairy proximally, lobes spreading, narrowly triangular, 1.2–1.5 mm. Achenes cylindric, ca. 2.5 mm, moderately stiff, yellowish 6.8–8.8 mm. Pappus 3-seriate, straw-colored, of sparsely barbulate bristles; outer bristles 0.5–0.7 mm; inner bristles 2–3 mm, acute; innermost bristles ca. 4 mm, clavate. Fl. Jun, fr. Jun–Sep.

 Aster lavandulifolius differs from other Aster species by its linear leaves and cylindrical achenes.

Aster motuensis Y. L. Chen (Bull. Bot. Res., Harbin 8(3): 12. 1988), described from SE Xizang (Mêdog) as being close to A. lavandulifolius, differs from the latter in its notably reticulately veined, oblong to oblanceolate leaves, narrowly cylindrical involucres, and 4–6 ray florets. Further study is required to ascertain its status.


东风菜组 dong feng cai zu

Herbs, perennial, usually simple, erect. Leaves basal (withered at anthesis) and cauline; blade ovate or elliptic-ovate, margin flat, serrate, rarely subentire, 1-veined. Capitula radiate, terminal, corymbiform or paniculiform. Involucres campanulate to broadly campanulate; phyllaries 3-seriate, unequal or subequal, not keeled, margin scarious. Receptacles flat or convex. Ray florets 1-seriate, 4–9, white; disk floret limb campanulate, 5–6 mm; phyllaries 3–5-seriate, unequal or subequal, of numerous persistent, free bristles, innermost ± clavate, outermost of short bristles.

Seven species: E Asia; two species (one endemic) in China.

1a. Phyllaries unequal, narrowly herbaceous on back, margin broadly membranous; pappus of many bristles as long as disk florets; achenes glabrous .......................................................... 9. A. scaber

1b. Phyllaries subequal, sometimes outer series herbaceous and green, inner series with membranous margins only; pappus of few bristles much shorter than corolla tube; achenes sparsely strigose ........................................ 10. A. marchandii


东风菜 dong feng cai

 Aster komarovi H. Léveillé; Biotia corymbosa (Aiton) Candolle var. discolor (Maximowicz) Regel; B. discolor Maximowicz; Doellingeria scabra (Thunberg) Nees.

Herbs, perennial, 70–150 cm tall; rhizome short, thickened. Stems erect, glabrous. Leaves reduced upward, abaxially pale green, flat, 3- or 5-veined, margin and both surfaces scabrous, abaxially less so, eglandular; basal leaves withered by anthesis, petiole 10–15 cm, blade ovate, 9–15 × 6–15 cm, base cordate, margin serrate, teeth mucronate, apex acute; middle cauline leaves shortly petiolate, petiole broadly winged; blade ovate to narrowly ovate, base truncate to rounded; upper cauline leaves broadly winged shortly petiolate to sessile, lanceolate. Capitula in corymbiform synflorescences, 1.8–2.4 cm in diam.; peduncles 6–30 mm, sparsely to moderately scabridulous, eglandular or stipitate glandular, bracts linear. Involucre campanulate, 5–6 mm in diam.; phyllaries 3-seriate, strongly unequal, green area narrow; outer phyllaries ca. 1.5 × 1–1.5 mm, abaxially glabrous, base of outer thickened, margin broadly scarious, sometimes purplish apically, ciliate, apex obtuse, sometimes acute. Ray florets 4–9, white, 6–10 mm, tube 3–3.5 mm, lamina abaxially glabrous, eglandular; disk florets 4.5–5 mm, limb abruptly enlarged, campanulate, ca. 3 mm, sparsely shortly hairy at tube-limb junction, lobes spreading, triangular, 1.5–2 mm. Achenes obovoid, sometimes slightly compressed, 3–4 mm, glabrous, 3–7-ribbed. Pappus of many sordid-white, barbellate bristles, 3.5–4.2 mm (slightly shorter than disk florets); outer bristles short (50% or less of inner length), slender; inner bristles length 80–90% of innermost bristles, tapering; innermost bristles longest, clavate. Fl. Jun–Oct, fr. Aug–Oct. 2n = 18.

Open slopes in valleys, grasslands, thickets, very common; below 2000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Zhejiang [Japan, Korea, Russia (Far East)].

This plant is used medicinally for treating bites from venomous snakes.


短冠东风菜 duan guan dong feng cai
Herbs, perennial, 0.6–2 m tall; rhizomes robust. Stems erect, sparsely to moderately puberulent. Leaves reduced upward, abaxially pale green, both surfaces scabrous, eglandular, slightly rugose, 3- or 5-veined, margin scabrous; basal leaves withered by anthesis, petiole 9–17 cm, blade ovate, 7–13 × 7–11.5 cm, base cordate, margin serrate, teeth mucronate, apex acute to subrounded; middle cauline leaves narrowly winged petiolate, broadly ovate to ovate, base truncate; upper cauline leaves winged shortly petiolate, ovate, base cuneate, decurrent. Capitula in corymbiform synflorescences, 2.5–4 cm in diam.; peduncles 10–50 mm, glabrate to densely puberulent, eglandular or stipitate glandular; bracts linear. Involucres broadly campanulate, 6–8 mm in diam.; phyllaries 3-seriate, subequal, dural or stipitate glandular; bracts linear. Involucres campanulate, 3–7 mm; phyllaries 3- or 4-seriate, unequal, not keeled, margin scarious. Receptacles flat or ± convex. Ray florets 1-seriate, 10–20, pale purple, lavender, or white; disk floret limb campanulate, lobes equal. Achenes obovoid to oblancoeloid, ± compressed, 3- or 4-ribbed (ray) or 2- or 3-ribbed (disk). Pappus of ray and disk florets 3-seriate, of numerous persistent, free bristles, innermost series clavate, outermost series of short bristles.

About eight species: E Asia; one species in China.


三脉叶紫菀 三脉叶紫菀

Herbs, perennial, 25–205 cm tall; rhizomes thick. Stems erect, simple or sometimes branched, reddish striate, glabrous or villosulous to strigillose, sometimes glabrescent, eglandular or minutely stipitate glandular. Leaves cauline; middle cauline leaves usually largest, abaxially pale green, adaxially green, sometimes shiny, thinly or thickly papery to subleathery, abaxially villosulous, sparsely scabridulous, or glabrous, minutely stipitate glandular or eglandular, veins densely villosulous to sparsely strigose or glabrate, adaxially ± densely scabridulous, eglandular or sometimes ± minutely stipitate glandular, resinous, margin serrate to coarsely serrate, sometimes serrulate, ciliate, often prominently abaxially 3-veined at base or above (tripinnerved), apex obtuse to acute or acuminate, mucronate; lowest leaves withered by anthesis, long narrowly winged petiolate (petiole to 6 cm); blade pubescent or ovate to narrowly lanceolate, 0.5–15(–17) × 0.3–5.5 cm, base attenuate; lower to upper cauline leaves shortly petiolate, ovate- or lanceolate-paniculate to lanceolate, 4.5–15 × 1.2–5.5 cm, base attenuate to rounded; synflorescence leaves shortly petiolate, ovate to linear-lanceolate, 1–8 × 0.2–3 cm, base cuneate to ± rounded. Capitula 7–100 or more florets in terminal paniculate-corymbose synflorescences, 1.5–2 cm in diam.; peduncles 5–30 mm, strigillose, minutely stipitate glandular; bracts linear to lanceolate, entire. Involucres campanulate, 3–7 × 4–15 mm; phyllaries 3- or 4-seriate, unequal, apically green, sometimes ± purplish, abaxially glabrate to villosulous (on green part), apically sometimes minutely stipitate glandular, base hardened, margin scarious, erosive, sometimes purplish, ciliate, midvein more pronounced distally, ± translucent, apex rounded to acute, ciliate; outer phyllaries ovate to lanceolate, 2–2.5 × 0.5–1 cm, leaflike or distally leaflike; inner phyllaries oblong, 3–6 mm. Ray florets 6–15, purple, lavender, reddish, or white, tube ca. 2 mm, lamina 7–11 × 1.5–3 mm, glabrous, eglandular; disk florets yellow, 4–6.5 mm, tube base flared, limb campanulate, 2.2–4 mm, base sparsely strigillose, lobes spreading, narrowly triangular, 1.3–2 mm, glabrous, sparsely to moderately minutely stipitate glandular. Achenes gray-brown, oblancoeloid to obovoid, slightly compressed, 2–2.5 mm, sparsely to moderately strigillose, minutely stipitate glandular or eglandular, 2- or 3-ribbed. Pappus 3-seriate, whitish or ± reddish, of slender, barbellate bristles; outermost bristles few, 0.2–0.3 mm; inner bristles 3–5 mm, tapering; innermost bristles 4.5–6 mm, clavate. Fl. and fr. Jul–Dec.

Forests, forest margins, thickets, wet places in valleys; 100–3400 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, NE India, Japan, Korea, N Myanmar, Nepal, E Russia, N Thailand, Vietnam].

ever, mentioning that there are intermediate forms between the two taxa, treated *A. ageratoides* as a subspecies of *A. trinervius*. Although the name of the former has been used in E Asia for a long time and there are many described varieties, differences between the two species do not appear to warrant species-level segregation at the present time.

*Aster trinervius* subsp. *ageratoides* is widely distributed and polymorphic. Kitamura (Mem. Coll. Sci. Kyoto Imp. Univ., Ser. B, Biol. 13: 327–377. 1937) and Handel-Mazzetti (Acta Horti Gothob. 12: 203–226. 1938) divided it into many varieties or subspecies (of *A. ageratoides*). The indumentum, leaf shape, capitula, and shape and size of the involucre are variable and often overlapping, however, and differences between some varieties are not clear. A thorough biosystematic and molecular phylogenetic investigation of the whole complex in Asia would be needed to identify entities that are worth recognition, as was done for Japanese members of the complex (e.g., Ito & Soejima in Iwatsuki et al., Fl. Japan 3b: 59–73. 1995), particularly in view of the possibility of hybridization among entities and with species of *A. sect. Pseudocalimeris*. Therefore, varieties usually recognized under *A. ageratoides* are here listed under *A. trinervius* subsp. *ageratoides*, with their main characteristics. It should be noted that some taxa listed here as varieties are recognized as species by Ito and Soejima (loc. cit.).

1a. Leaves subleathery (thick), 3-veined at base, base subrounded; involucres 8–15 mm in diam. ............................  11a. subsp. *trinervius*

1b. Leaves papery (thin), sometimes rather thick, 3-veined above base (triplinerved), base attenuate; involucres 4–10 mm in diam. ......  11b. subsp. *ageratoides*

11a. *Aster trinervius* subsp. *trinervius*


Aster trinervius

11a. *Aster trinervius* subsp. *trinervius*

三脉紫菀 (原亚种)  san mai zi wan (yuan bian zhong)

*Aster trinervius* Turczaninow subsp. *trinervius* (Roxburgh ex D. Don) Kitamura; *A. ageratoides* var. *trinervius* (Roxburgh ex D. Don) Handel-Mazzetti, *A. scabridus* C. B. Clarke; *Diploappus asperrimus* (Nees) Candolle; *Galatella asperrima* Nees.

Stems erect, 60–205 cm tall, thick, branched, strigose. Leaves subleathery (thick), sometimes thin; blade ovate-lanceolate, abaxially strigillose or glabrate, glandular, adaxially strigose, 3-veined at base, conspicuously reticulate veined, base subrounded. Involucres 8–15 mm in diam.: phyllary apex green, sometimes tinged red. Ray florets white.

*Pinus* forests: ca. 3100 m. S Xizang [Bhutan, NE India, N Myanmar, Nepal, N Thailand].

Under *Aster trinervius* subsp. *trinervius* only var. *trinervius* occurs in China.


三脉紫菀  san mai zi wan


Stems erect, 40–100 cm tall, slender or thick, branched, strigose. Leaves papery (thin, sometimes rather thick); blade broadly ovate, elliptic, or oblong-lanceolate, abaxially puberulent, veins strigose, adaxially strigose, often glandular, or both surfaces tomentulose, 3-veined above base (triplinerved), base attenuate. Involucres 4–10 mm in diam.; phyllary apex green or purple-brown. Ray florets purple, reddish, or white.

Forests, forest margins, thickets, wet places in valleys; 100–3400 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, NE India, Japan, Korea, N Myanmar, Nepal, E Russia, N Thailand, Vietnam].

Some of the varieties listed here under *Aster trinervius* subsp. *ageratoides* have available names under *A. trinervius*, while others do not. In view of the fact that all of the varieties have names under *A. ageratoides*, those names are used here in preference to publishing new combinations, pending the necessary thorough investigation mentioned above.

*Aster ageratoides* var. *ageratoides*

*ASTEREAE*

异叶三脉紫菀  yi ye san mai zi wan

Aster nigrescens Vaniot.

Stems multibranched. Middle leaves oblong-lanceolate, margin roughly serrate, upper leaves smaller, margin often entire. Phyllaries narrow, apex green, often ?brown mucronate.

- S Gansu, Hebei, NW Hubei, Shanxi, Shanxi, Sichuan, N Yunan.


毛枝三脉紫菀  mao zhi san mai zi wan

Aster lasiocladus Hayata, Icon. Pl. Formosan. 8: 49. 1919; A. ageratoides subsp. lasiocladus (Hayata) Kitamura; A. trinervius var. lasiocladus (Hayata) Yamamoto.

Stems yellow-brown or gray tomentose. Leaves oblong-lanceolate, often smaller, 4–8 × 1–3 cm, thick, adaxially densely strigose, or densely tomentose, veins often rough hairy, margin shallowly dentate, apex obtuse or acute. Phyllaries thick, densely tomentose. Ray florets white.

- Anhui, Fujian, Guangdong, Guizhou, Hainan, Hunan, Jiangxi, Taiwan, SE Yunan.

This variety is easy to distinguish from other varieties of Aster trinervius subsp. ageratoides and appears closer to A. trinervius subsp. trinervius, but the latter has thicker leaves and is more densely tomentose. 

This plant is used medicinally for treating common colds and headaches, osteodynia, and snakebites.


宽伞三脉紫菀  kuan san san mai zi wan


Stems multibranched. Middle leaves oblong-lanceolate or ovate-lanceolate, abaxially often glabrescent, base attenuate, margin with 7- or 8-paired serrae, upper leaves ovate or lanceolate, small, margin entire or toothed. Phyllaries narrow, apex green. Ray florets often white. 2n = 18*, 36*, 54*.

- Anhui, Fujian, Guangdong, Guizhou, Hubei, Hunan, Jiangxi, Shanxi, Sichuan.


光叶三脉紫菀  guang ye san mai zi wan


Leaves oblong-lanceolate, abaxially with short rough hairs on veins, adaxially ± strigose, base abruptly narrowed, sessile or shortly petiolate, margin densely acute-serrate, apex long acuminate. Capitula small, slender pedunculate. Involucre obconic when dry, ca. 4 × 5–6 mm; phyllary apex obtuse, apically brown. Ray florets white. Pappus white or red-brown. 2n = 18, 18+1–3B, 27, 34, 36+0–4B, 37, 54, 81.

Taiwan [Japan].


小花三脉紫菀  xiao hua san mai zi wan

Stems 60–100 cm tall, slender, multibranched. Leaves linear-lanceolate, thinly papery, subglabrous on both surfaces, areoles adaxially ± foamy; middle leaves 6–17 × 0.4–1.5 cm, margin sparsely shallowly toothed or subentire. Capitula small, in axillary and terminal corymbs; peduncle slender. Involucre 3–4 × 4–5 mm; phyllaries thin, apex purple-brown or green. Ray florets white, linear, 4–5 mm; disk florets and pappus ca. 4 mm. 2n = 18*.

- Forests, thickets. Sichuan.


卵叶三脉紫菀  luan ye san mai zi wan


Leaves ovate and ovate-lanceolate, rather thick, abaxially sparsely hairy, adaxially strigose, margin shallowly serrate. Phyllaries reddish at apex. Ray florets reddish or white.

- Hubei, Shanxi, Sichuan, Yunan; rarely seen in N China.

Y. Ling published Aster ageratoides var. oophyllus as a “nom. nov.” based on A. ageratoides var. ovatus (Franchet & Savatier) Handel-Mazzetti, but he explicitly excluded the basionym (and thereby the type) of the latter name, i.e., A. trinervius var. oovatus Franchet & Savatier. Ling did not indicate a type for A. ageratoides var. oophyllus, which cannot, therefore, be validly published as the name of a new taxon; however, he cited A. blinii in synonymy with a full and direct reference to its author and place of valid publication, hence var. oophyllus was validly published as a replacement name based on A. blinii.


垂叶三脉紫菀  chui jing san mai zi wan

Stems pendent, multibranched. Basal and lower cauline leaves abaxially very often purple. Cauline leaves linear-lanceolate, adaxially often hirsute, base attenuate, margin with ca. 4-paired serrae. Phyllaries 1.25–1.75 mm wide, apex obtuse or acute. Phyllaries thick, densely tomentose. Ray florets white. 2n = 18*, 36*, 54*.

- Anhui, Fujian, Guangdong, Guizhou, Hainan, Hunan, Jiangxi, Shanxi, Sichuan.


长毛三脉紫菀  chang mao san mai zi wan

Aster trinervius var. pilosus Diels, Bot. Jahrb. Syst. 29: 610. 1901 [“pilosus”].
Leaves ovate or oblong-lanceolate, rather thick, abaxially densely finely hairy, glandular, adaxially shortly striiform, adaxially on veins and stems spreading white or gray long hairs, hairs ca. 1 mm, base gradually or abruptly attenuate, margin shallowly serrate. Phyllaries purple-brown at apex.

- W Hubei, S Shaanxi, C and E Sichuan.


Aster indicus

A. longipetiolatus

A. incisus

A. incisus f. pubescens

Aster scaberulus

Phyllaries subleathery, with scarious margins, apically rounded or obtuse, green or reddish purple; achenes 1.5–2.5 mm, glandular and puberulent; pappus 0.1–0.3 mm; leaf margin more variable

A. indicus

A. indicus var. szimadae

1. Involucre 10–12 mm in diam., phyllaries narrow and small, 4–5 mm; leaves incised-dentate or sometimes pinnatifid

2. Phyllaries subleathery, with scarious margins, apically rounded or obtuse, green or reddish purple; achenes 2.5–3.5 mm, sparsely long hairy; pappus 0.7–1.5(–2) mm.

3a. Involucres 5–7 × 6–10 mm; phyllary apex green. Ray florets white or tinged red.

3b. Involucres 5–7 × 2–3 mm.

4a. Leaves entire or pinnatifid, or shallowly dentate, leathery

4b. Leaves pinnatilobate, submembranous

5a. Leaves obovate-oblong or oblanceolate, dentate or pinnately lobed, often entire in upper part.

5b. Leaves thinner, sparsely puberulent or subglabrous; achenes 1.5–2 mm; pappus 0.1–0.3 mm; leaf margin more variable

6a. Leaves thicker, densely velutinous; achenes 2.5–2.7 mm; pappus ca. 0.3 mm; leaf margin toothed

7a. Phyllaries subleathery, with scarious margins, apically rounded or obtuse, green or reddish purple; achenes 1.5–2.5 mm, glandular and puberulent in upper part; pappus 0.1–0.8 mm.

7b. Leaves linear-lanceolate, oblong, or lanceolate, entire or minutely 1–3-denticulate

8a. Phyllaries subleathery, with scarious margins, apically rounded or obtuse, green or reddish purple; achenes 2.5–3.5 mm, sparsely long hairy; pappus 0.7–1.5(–2) mm.

8b. Leaves obovate-oblong or oblanceolate, dentate or pinnately lobed, often entire in upper part.

9a. Leaves thinner, sparsely puberulent or subglabrous; achenes 1.5–2 mm; pappus 0.1–0.3 mm; leaf margin more variable

9b. Leaves toothed, densely velutinous; achenes 2.5–2.7 mm; pappus ca. 0.3 mm; leaf margin toothed

10a. Phyllaries subleathery, with scarious margins, apically rounded or obtuse, green or reddish purple; achenes 1.5–2.5 mm, glandular and puberulent in upper part; pappus 0.1–0.8 mm.

10b. Leaves linear-lanceolate, oblong, or lanceolate, entire or minutely 1–3-denticulate

11a. Phyllaries subleathery, with scarious margins, apically rounded or obtuse, green or reddish purple; achenes 2.5–3.5 mm, sparsely long hairy; pappus 0.7–1.5(–2) mm.

11b. Leaves obovate-oblong or oblanceolate, dentate or pinnately lobed, often entire in upper part.

12a. Phyllaries subleathery, with scarious margins, apically rounded or obtuse, green or reddish purple; achenes 1.5–2.5 mm, glandular and puberulent in upper part; pappus 0.1–0.8 mm.

12b. Leaves linear-lanceolate, oblong, or lanceolate, entire or minutely 1–3-denticulate

13a. Phyllaries subleathery, with scarious margins, apically rounded or obtuse, green or reddish purple; achenes 2.5–3.5 mm, sparsely long hairy; pappus 0.7–1.5(–2) mm.

13b. Leaves obovate-oblong or oblanceolate, dentate or pinnately lobed, often entire in upper part.

14a. Phyllaries subleathery, with scarious margins, apically rounded or obtuse, green or reddish purple; achenes 2.5–3.5 mm, sparsely long hairy; pappus 0.7–1.5(–2) mm.

14b. Leaves obovate-oblong or oblanceolate, dentate or pinnately lobed, often entire in upper part.

15a. Phyllaries subleathery, with scarious margins, apically rounded or obtuse, green or reddish purple; achenes 2.5–3.5 mm, sparsely long hairy; pappus 0.7–1.5(–2) mm.

15b. Leaves obovate-oblong or oblanceolate, dentate or pinnately lobed, often entire in upper part.

16a. Phyllaries subleathery, with scarious margins, apically rounded or obtuse, green or reddish purple; achenes 2.5–3.5 mm, sparsely long hairy; pappus 0.7–1.5(–2) mm.

16b. Leaves obovate-oblong or oblanceolate, dentate or pinnately lobed, often entire in upper part.

17a. Phyllaries subleathery, with scarious margins, apically rounded or obtuse, green or reddish purple; achenes 2.5–3.5 mm, sparsely long hairy; pappus 0.7–1.5(–2) mm.

17b. Leaves obovate-oblong or oblanceolate, dentate or pinnately lobed, often entire in upper part.

18a. Phyllaries subleathery, with scarious margins, apically rounded or obtuse, green or reddish purple; achenes 2.5–3.5 mm, sparsely long hairy; pappus 0.7–1.5(–2) mm.

18b. Leaves obovate-oblong or oblanceolate, dentate or pinnately lobed, often entire in upper part.
Yunnan, Zhejiang [India, Japan, Korea, Laos, Malaysia, N Myanmar, E Russia, N Thailand, N Vietnam].

*Aster indicus* has been referred to the American genus *Boltonia* L’Héritier, but it differs from it in having achenes without long hairs at the top of the marginal ribs and ray floret achenes often thickly 3-ribbed and triangular.

This species is used medicinally to promote digestion and relieve dyspepsia, promote diuresis, dissipate blood stasis, eliminate toxins, and stop bleeding. The young leaves are usually used as a vegetable in the East.

1a. Leaf surfaces glabrous or sparsely puberulent, eglandular ........................................ 12a. var. *indicus*

1b. Leaf surfaces sparsely to densely puberulent, sparsely glandular.

2a. Cauline leaves lanceolate to oblong, sparsely puberulent; rhizomes 0.5–1–(3.5) cm ...................... 12b. var. *stenolepis*

2b. Cauline leaves obovate to oblong, densely puberulent; rhizomes 5–15 cm ...................... 12c. var. *collinus*

12a. Aster *indicus* var. *indicus*

马兰 (原变种) ma lan (yuan bian zhong)

*Aster cantoniensis* (Loureiro) Courtous; *A. ursinus* H. Léveillé (1913), not E. S. Burgess (1903); *A. yangtzensis* Migo; *Asteromoea cantoniensis* (Loureiro) Matsumura; *A. indica* (Linnaeus) Blume; *Boltonia cantoniensis* (Loureiro) Franchet & Savatier; *B. indica* (Linnaeus) Bentham; *B. indica* var. *rivularis* Hance; *Hisutsua cantoniensis* (Loureiro) Hance, Acta Phytotax. Geobot. 58: 98. 2007.

Herbs, perennial, (30–)60–200 cm tall, rhizomatous. Stems erect, much branched, densely hispidulous. Leaves thick, densely velutinous, adaxial veins densely hispidulous, margin densely hispidulous-ciliate, 3-veined; lower cauline leaves withered by anthesis; middle cauline leaves subsessile, obovate, oblongate, or elliptic, 2.5–4 × 1.2–2 cm, base gradually attenuate, margin sharply 1- or 2-toothed or entire; upper leaves gradually smaller, oblongate or linear. Capitula 20–85 in loose corymbiform synflorescences, 2–2.5 cm in diam. involucres hemispheric, 6–7 × 8–10 mm; phyllaries 3-seriate, unequal, abaxially densely hairy; outer phyllaries narrowly oblong, 2–3 mm; inner phyllaries oblongate-oblong, ca. 5 mm, margin scarious, ciliate, apex leaflike. Ray florets ca. 10, purplish, tube ca. 1.5 mm, hairy, lamina 11–12 × 2–3 mm; disk florets 4–4.5 mm, tube ca. 1.5 mm, hairy. Achenes gray-brown, obovoid, compressed, 2.5–2.7 mm, striglilose, 2-ribbed. Pappus scaly, ferruginous, ca. 0.3 mm, persistent. Fl. and fr. Jun–Nov.

- Forest margins, grassy slopes, dry stony areas, riverbanks; sea level to 2800 m. Anhui, Fujian, Gansu, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Ningxia, Shaanxi, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Japan, Korea, Laos, Malaysia, N Myanmar, E Russia, N Thailand, N Vietnam].

The young rosettes are used in salads; the leaves are used as folk medicine.


狭包马兰 xia bao ma lan


Rhizomes 0.5–1(–3.5) cm. Cauline leaves lanceolate to oblong, sparsely puberulent, sparsely glandular.

- Protected shaded habitats; 200–3000 m. Anhui, Fujian, Gansu, Guangdong, Henan, Hubei, Hunan, Jiangsu, Jiangxi, SW Shaanxi, E Sichuan, Zhejiang.


丘陵马兰 qiu ling ma lan


Rhizomes 5–15 cm. Cauline leaves obovate to oblong, densely puberulent, sparsely glandular. Fl. May–Nov.

- Roadsides, crop field margins; 200–1700 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Yunnan.


止毛马兰 zhan mao ma lan


Herbs, perennial, (30–60–200 cm tall, rhizomatous. Stems erect, much branched, densely hispidulous. Leaves thick, densely velutinous, adaxial veins densely hispidulous, margin densely hispidulous-ciliate, 3-veined; lower cauline leaves withered by anthesis; middle cauline leaves subsessile, obovate, oblongate, or elliptic, 2.5–4 × 1.2–2 cm, base gradually attenuate, margin sharply 1- or 2-toothed or entire; upper leaves gradually smaller, oblongate or linear. Capitula 20–85 in loose corymbiform synflorescences, 2–2.5 cm in diam. involucres hemispheric, 6–7 × 8–10 mm; phyllaries 3-seriate, unequal, abaxially densely hairy; outer phyllaries narrowly oblong, 2–3 mm; inner phyllaries oblongate-oblong, ca. 5 mm, margin scarious, ciliate, apex leaflike. Ray florets ca. 10, purplish, tube ca. 1.5 mm, hairy, lamina 11–12 × 2–3 mm; disk florets 4–4.5 mm, tube ca. 1.5 mm, hairy. Achenes gray-brown, obovoid, compressed, 2.5–2.7 mm, striglilose, 2-ribbed. Pappus scaly, ferruginous, ca. 0.3 mm, persistent. Fl. and fr. Jun–Nov.

- Forest margins, grassy slopes, dry stony areas, riverbanks; sea level to 2800 m. Anhui, Fujian, Gansu, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Zhejiang.


止叶马兰 zhi ye ma lan


Herbs, perennial, (10–30–140 cm tall; roots erect, fusiform. Stems erect, solitary or several fascicled, hispidulous, fas-
tigially branched from middle part. Leaves gray-green, puberulent-tomentulose, midvein adaxially prominent; lower cauleine leaves withered by anthesis; middle leaves dense, sessile, linear-lanceolate, oblanceolate, or oblong, 2.5–4 × 0.4–0.6 cm, base gradually attenuate, margin revolute, entire, apex obtuse or acuminate, muronate; upper leaves small, linear. Capitula in loose corymbiform synflorescences. Involucres hemispheric, ca. 4 × 7–8 mm; phyllaries 3-seriate, imbricate, abaxially densely hispidulous, densely glandular; outer phyllaries linear, ca. 1.5 mm; inner phyllaries oblong-oblanceolate, ca. 4 mm, acute, leaflike distally. Ray florets 19–29, pale lilac to purple, tube ca. 1 mm, hairy, lamina (5.2–)6–13.5(–15) × ca. 2.5 mm; disk florets 2.1–3.4 mm, tube ca. 1 mm, hairy, lobes unequal. Achenes brownish, obovoid, compressed or sometimes trigonous, 1.8–2 × ca. 1.5 mm, apically puberulent and glandular, 2–4-ribbed. Pappus easily deciduous, brownish, fragile, 0.3–0.5 mm, unequal, sometimes absent. Fl. May–Oct, fr. Jul–Nov.

Forest margins, thickets, mountain slopes, riverbanks, roadsides; sea level to 1600 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang [Korea, E Russia].


*Aster incisus var. australis* Kitagawa; *A. pinnatifidus* Makino f. robustus Makino; *Asteromoea incisa* (Fischer) Koidzumi; *Boltonia incisa* (Fischer) Bentham; *Grindeola incisa* (Fischer) Sprengel; *Kalimeris incisa* (Fischer) Candolle; *K. incisa* var. *australis* (Kitagawa) Kitagawa; *K. platycephala* Cassini.

Herbs, perennial, 30–120 cm tall, rhizomatous. Stems erect, branched in upper part, sulcate, glabrous or sparsely strigose. Leaves thin; lower cauleine leaves withered by anthesis; middle leaves sessile, elliptic-lanceolate or lanecolate, 6–10(–15) × 1.2–2.5(–4.5) cm, abaxially strigose to glabrate, adaxially glabrous or glabrate, base gradually attenuate, margin incised-serrate, sometimes pinnatifid, rarely entire, scabrous, veins prominent, apex acuminate; upper leaves reduced, linear-lanceolate, entire. Capitula 10–55 in open corymbiform synflorescences, 2.5–3.5 cm in diam. Involucres hemispheric, 5–7.5 × 7–12 mm; phyllaries 3-seriate, imbricate, oblanceolate-lanceolate, abaxially sparsely strigillose, margin ciliate; outer phyllaries 3–4 mm, acute; inner phyllaries 4–5 mm, margin scarious, purplish, apex obtuse. Ray florets (13–)16–27(–29), pale lilac to bluish purple, tube 1.1–1.5 mm, lamina 1.5–1.8 × 0.2–0.25 cm; disk florets yellow, 3–4 mm, tube 1–1.3 mm, limb campanulate, hairy, lobes triangular, ca. 0.6 mm, glabrous. Achenes brownish, obovoid, compressed, 3–3.5 mm, strigose, margin pale 2-ribbed or sometimes 3-ribbed. Pappus reddish, 0.5–1.2 mm. Fl. and fr. Jun–Oct. 2n = 18.

Grasslands on slopes, thickets, open places between forests, semi-open second-growth forests, wet grasslands, sometimes roadsides; 300–1000 m. Heilongjiang, Jilin, Liaoning, E Nei Mongol [Japan, Korea, E Russia].


Herbs, perennial, 50–100 cm tall. Stems erect, solitary or 2- or 3-fascicled, sulcate, branched in upper part, scabrous. Leaves thick or subleathery, sparsely scabrous or glabrous, margin revolute, scabrous; lower cauleine leaves withered by anthesis; middle leaves sessile, oblong to broadly oblong or sometimes oblanceolate, 3–6(–9) × 0.5–2.4 cm, base gradually attenuate, margin remotely serrate to pinnatifid, sometimes entire, apex acute to obtuse; synflorescence leaves linear-lanceolate to linear, margin entire. Capitula 19–90 in corymbiform synflorescences, 2.5–3.5 cm in diam. Involucres hemispheric, 10–14 mm in diam.; phyllaries 3-seriate, unequal, apically green, glabrous, margin scabrous; outer phyllaries elliptic, 2.3–4.5 mm, apex acute; inner phyllaries oblanceolate-elliptic, 4.7–6.5(–7.6) × 1.8–3.2 mm, obtuse, margin scarious, erose-fimbriate, purplish. Ray florets 13–22, bluish, tube 1.2–1.4 mm, lamina 1.5–2 × 0.2–0.3 cm; disk florets yellow, 4–5.8 mm, tube 0.7–1.3 mm, upper tube and limb hairy, limb campanulate, lobes lanceolate, 0.5–1.1(–1.5) mm, glabrous. Achenes brownish, obovoid, compressed or sometimes trigonous, 3–4 × ca. 2 mm, sparsely strigillose, pale 2- or 3-ribbed. Pappus straw-colored or brownish, 0.4–1 mm. Fl. and fr. Jun–Oct.

- Meadows, thickets, mountain slopes, stream banks, ditches, dry roadsides; 100–2200 m. Gansu, Hebei, Heilongjiang, Henan, Jiangsu, Jilin, Liaoning, Ningxia, Shaanxi, Shandong, Shanxi, Zhejiang.

16a. Aster lautureanus var. laureauanus

山马兰 yuanyuan bian zhong


Leaves oblong to oblanceolate, 0.5–2 cm wide; disk floret corolla 4.5–5.1 mm .................................................................. 16a. var. *lautearanus*

16b. Aster laureauanus var. mangtaoensis

山马兰 (原变种) shan ma lan

Leaves broadly oblong, 1.5–2.4 cm wide. Disk floret corolla 5–5.8 mm. Fl. and fr. Jul–Aug.

- Liaoning (Xiaolongshan Dao).


蒙古马兰 meng gu ma lan

Aster associatus Kitagawa; A. associatus var. stenolobus Kitagawa; A. lauturnus (Debeaux) Franchet var. holophyllus (Maximowicz) F. H. Chen; A. lauturnus var. mongolicus (Franchet) Kitagawa; Asteromoea mongolica (Franchet) Kitamura; Kalimeris associata (Kitagawa) Kitagawa; K. incisa (Fischer) Candolle var. holophylla Maximowicz; K. mongolica (Franchet) Kitamura.

Herbs, perennial, 50–122 cm tall. Stems erect, sulcate upward, strigorse, branched in upper part. Leaves submembranous; lowermost cauline leaves withered by anthesis; lower and middle leaves: blade oblanceolate to narrowly oblanceolate, 5–9 × 2–4 cm, sparsely hispidulous or glabrate, margin pinnatifid, densely hispidulous; lobes linear-oblong, margin entire, apex obtuse; uppermost leaves linear-lanceolate, 1–2 cm. Capitula 12–45 in corymbiform synflorescences, 2.5–3.5 cm in diam. Involucre hemispheric, 1–1.5 cm in diam.; phyllaries 3- or 4-seriate, unequal, apically green, elliptic to obovate, 5–7 × 3–4 mm, glabrous, margin scarious, white or purplish, lacerate, apex obtuse. Ray florets (11–)14–25, bluish purple, bluish or white, tube ca. 2 mm, lamina 13.5–25.5 × 2.7–4.8(–5.2) mm; disk florets yellow, 3.5–4.9 mm, tube 0.8–1.6(–1.8) mm, lobes unequal, 0.8–2.1 mm. Achenes straw-colored or brownish, obovoid, compressed or sometimes trigonous, ca. 3.5 × 2.5 mm, sparsely strigilllose, rarely apically glandular, yellowish 2- or 3-ribbed. Pappus brownish, unequal, 0.3–1.2 mm. Fl. and fr. Jun–Oct.

Herbs, perennial, 50–70 cm tall, rhizomatous. Stems erect, simple, slender, villous. Leaves remote, thin, sparsely hairy, margin, adaxially along veins, and petiole densely villous, basally palmately veined, lateral veins 2- or 3-paired, reticulate veins ± conspicuous; basal leaves withered by anthesis or rarely persistent; lower cauline leaves long petiolate; petiole slender, 12–16 cm; blade broadly ovate, 6–7 × 4–6 cm, base truncate or shallowly cordate, margin coarsely serrate (teeth mucronulate), apex acute or cuspidate; middle leaves shortly petiolate; blade cordate, margin coarsely crenate; upper leaves gradually reduced, small, subentire, grading into linear-lanceolate bracts. Capitula 1 or 2, 3.5–4.5 cm. Phyllaries 2- or 3-seriate, equal, linear-oblancoate, 5–6 mm, leaflike, apex acuminate, subulate-mucronate; inner phyllaries leaflike in upper part, hairy, margin scarious, erose. Ray florets ca. 30, bluish, tube ca. 2 mm, sparsely hairy near base, lamina linear, ca. 20 × 1–1.3 mm; disk florets yellow, ca. 3 mm, tube short, glabrous. Achenes (not seen; ovary) cylindric, ± compressed. Pappus dirty white, of scalelike bristles, 0.3–1 mm, unequal. Fl. Jul.

- Brooklet banks, valleys; ca. 2500 m. W Sichuan.

Aster longipetiolatus was not included in the revision of Kalimeris by Gu and Hoch (Ann. Missouri Bot. Gard. 84: 762–814. 1997); its affinities require investigation. Specimens were not seen by one of us (Brouillet).


假马兰组 jia ma lan zu

Heteropappus Lessing.

Herbs, perennial, biennial, or annual, simple or branched, erect, ascending, or decumbent. Leaves basal (withered at anthesis) and cauline; blade linear, oblanceolate, oblanceolate, or spatulate-oblong to spatulate, margin flat, entire or remotely serrate or crenate, 1-veined. Capitula radiate, sometimes discoid, terminal, corymbose-paniculiform or solitary at ends of branches or stems. Involucres hemispheric or patelliform; phyllaries 2- or 3-seriate, subequal (outer sometimes shorter), not keeled, margin sometimes scarious. Receptacles flat. Ray florets 1-seriate, sometimes absent, 15–40, purple, lilac, blue, pink, or white; disk floret limb campanulate, narrowly campanulate, or funnelform, lobes unequal (1 lobe deeper). Achenes obovate or obovoid to obovate-oblong, com- scarious. Receptacles flat. Ray florets 1-seriate, sometimes absent, 15–40, purple, lilac, blue, pink, or white; disk floret limb campanulate, narrowly campanulate, or funnelform, lobes unequal (1 lobe deeper). Achenes obovate or obovoid to obovate-oblong, compressed to flattened, 2-ribbed. Pappus of ray florets sometimes absent or few, short, of disk florets present, 1–3-seriate, persistent or deciduous, inner bristles acute (when present), outer series of free (rarely connate) short scales or bristles.

About 17 species: C and E Asia, E Europe; 12 species (three endemic) in China.

1a. Perennial herbs, rarely biennial; pappus of ray and disk florets identical.

2a. Capitula discoid ................................................................................................................................................... 23. A. eligulatus

2b. Capitula radiate.

3a. Plants 2.5–7 cm, thickly taprooted ..................................................................................................................... 22. A. boveri

3b. Plants (3.5–)5–60(–100) cm, not taprooted.

4a. Phyllary margin herbaceous or narrowly scarious ............................................................................................ 20. A. asagrayi

4b. Phyllary margin ± broadly scarious (at least inner series).

5a. Phyllary margin broadly scarious; stems erect; ray florets ca. 20 ........................................................................ 19. A. altaicus

5b. Phyllary margin broadly scarious in inner series; stems decumbent to ascending; ray florets (20–)25–35 .......................................................... 21. A. semiprostratus
1b. Annual or biennial herbs, sometimes also perennial (*A. arenarius*); pappus of ray florets usually short, sometimes absent or equaling that of disk.

6a. Leaves glabrous or glabrate (margin conspicuously ciliate).

7a. Stems erect; cauleine leaves glabrate ................................................................. 28. *A. oldhamii*

7b. Stems procumbent; cauleine leaves glabrous or sometimes sparsely strigose .......................................... 27. *A. arenarius*

6b. Leaves hairy.

8a. Plants 8–30 cm tall, branched from base, branches decumbent to ascending .................................................. 30. *A. gouldii*

8b. Plants 10–50(–150) cm tall, branched from middle, branches ascending.

9a. Pappus of ray florets long ......................................................................................... 26. *A. neobienensis*

9b. Pappus of ray florets absent or of short bristles (shorter than on disk florets); ray achene narrow, sterile.

10a. Capitula 30–50 mm in diam.; middle cauleine leaf margin coarsely serrate in upper part or entire .......................................................... 25. *A. meyendorffii*

10b. Capitula 10–25 mm in diam.; middle cauleine leaf margin entire or crenate.

11a. Ray pappus a crown of scales; cauleine leaves oblong-lanceolate or linear, margin entire ...................................................... 24. *A. hispidus*

11b. Ray pappus a few short bristles or equaling that of disk; cauleine leaves spatulate-oblong, margin crenate .................................................................................. 29. *A. crenatifolius*


阿尔泰狗娃花 *a er tai gou wa hua*

Altaic *Aster* Herbs perennial, roots procumbent or vertical, not tap-rooted. Stems usually many, erect, 10–60(–100) cm, covered with closely-set thin hairs directed upward and often glandular in upper part, branched. Basal leaves withered by anthesis, lower linear or oblong-lanceolate, obovate or spatulate, 2.5–6(–10) × 0.7–1.5 cm, margin entire or remotely shallowly toothed, upper gradually diminished, both surfaces pubescent, densely minutely glandular, midvein abaxially slightly convex. Capitula radiate, numerous, 2–3.5(–4) cm in diam.; solitary and terminal or in corymbose-paniculiform synflorescences. Involucres hemispheric, 0.8–1.8 cm in diam.; phyllaries 2- or 3-seri ate, subequal or outer series short, oblong-lanceolate or linear, 4–8 × 0.5–1.8 mm, abaxially or all outer series leaflike, shortly rough pilose, short-stipitate glabrous, acuminate, outermost linear and shorter than inner, margin ± broadly scarious. Ray florets ca. 20, bluish purple or lilac, tube 1.5–2.8 mm, hairy, lamina oblong-linear, 10–15 × 1.5–2.5 mm; disk florets yellow, 5–6 mm, tube 1.5–2.2 mm, lobes unequal, 0.6–1 × 1–1.4 mm, hairy. Achenes obvate-oblong, compressed, 2–3 mm, strigose, glandular. Pappus of ray and disk florets identical, sordid white or pale brown, of subequal bristles, 4–6 mm. Fl. and fr. Jul.–Sep.

Steppe, meadows, salt marshes, grasslands, open slopes, stony slopes, rock outcrops, seashores, roadsides, sandy places by riverbanks; sea level to 4000 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, W Sichuan, Taiwan, Xinjiang, Xizang, NW Yunnan, Zhejiang [Afghanistan, NW India, Kashmir, Kazakhstan, Korea, Mongolia, Nepal, Pakistan, Russia (Siberia), Turkmenistan, Uzbekistan; SW Asia (Iran)].

1a. Inner phyllary margin narrowly scarious ............................................................... 19f. *var. taitoensis*

1b. Inner phyllary margin narrowly or broadly scarious.

2a. Stems and leaves spreading and coarsely white hairy ........................................ 19e. *var. hissatus*

2b. Stems and leaves strigose.

3a. Plants often gray-white, virgately branched; leaves, especially upper, adnate to stems or peduncles .............. 19b. *var. canescens*

3b. Plants green, procumbent-branched; leaves not always pressed to stems.

4a. Stems 10–30 cm tall, usually branched from base, ascending, ± procumbent at base; capitula solitary at ends of branches ........ 19a. *var. altaicus*

4b. Stems 20–60 cm tall, branched in upper part or multibranched and short, subequal; capitula in few to multibranched synflorescences.

5a. Leaves lanceolate; synflorescences few branched; stems erect ...................... 19c. *var. scaber*

5b. Leaves linear-lanceolate, narrow; synflorescences multibranched; stems erect or ascending .............................................. 19d. *var. millefolius*

19a. *Aster altaicus* var. *altaicus*

阿尔泰狗娃花（原变种）*a er tai gou wa hua (yuan bian zhong)*

*Aster gmelinii* Tausch; *Heteropappus altaicus* (Willdenow) Novopokrovsky; *Kalimeris altaica* (Willdenow) Nees; *K. altaica* var. *subincana* Avé-Lallemant.

Plants green. Stems ascending or erect, 10–30 cm tall, covered with upwardly curved appressed short hairs, branched from base, with few branches. Leaves spreading, linear-lanceolate or spatulate, 3–7(–10) × 0.2–0.7 cm. Capitula solitary, terminal on branches. Involucres 5–15 mm in diam.; phyllaries with outer margin narrowly scarious, inner margin broadly scarious, glandular, hairy.

Steppe, meadows, salt marshes, stony slopes of lower hills, roadsides, roadsides by riverbanks. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong,
Shanxi, NW Sichuan, Xining, Xizang [Kashmir, Kazakhstan, Mongolia, Russia (Siberia)].

"Aster angustifolius" (Royle, Ill. Bot. Himal. Ms. 251, t. 58, f. 1. 1835) belongs here but is a nomen nudum and was therefore not validly published (Vienna Code, Art. 32.1.d).


灰白阿尔泰狗娃花 hui bai a er tai gou wa hua

Kalimeris canescens Nees, Gen. Sp. Aster. 229. 1832; Aster canescens (Nees) Fisjuijn (1965), not Pursh (1813); A. pyropappus Boissier; A. spatioides C. B. Clarke; Heteropappus alberti (Regel) Novopokrovsky; H. altaicus var. canescens (Nees) Koroljuk; H. canescens (Nees) Novopokrovsky; K. alberti Regel.

Plants gray-white. Stems erect or ascending, 30–60 cm tall, strigillose, glandular, branched from base, virgately branched in upper part. Leaves broadly subspatulate, 0.5–0.6 cm; upper adnate to branches and peduncles, linear, ca. 1 × 0.1–0.2 cm, or oblong-linear. Involucres 0.9–1.1 cm in diam.; outer phyllaries leaflike, inner phyllaries with membranous margin, glandular, puberulent.

Dry stony mountains. N Xinjiang [Afghanistan, NW India, Kazakhstan, Mongolia, Pakistan, Russia (W Siberia), Turkmenistan, Uzbekistan; Iran].


粗糙阿尔泰狗娃花 cu cao a er tai gou wa hua


Plants green. Stems erect, 20–60 cm, usually branched from middle, sparsely strigillose. Leaves remote, lanceolate, ca. 3 × 0.4 cm. Capitula in few branched synflorescence.

● Liaoning, Shanxi.


千叶阿尔泰狗娃花 qian ye a er tai gou wa hua


Plants green. Stems erect or ascending, covered with upwardly curved appressed short hairs, glandular, with many subequal and spreading branches. Leaves spreading, linear or linear-lanceolate, 1–2 × 0.1–0.25 cm. Capitula in multibranched, densely leafy synflorescences. Involucres 0.5–8 mm in diam.; phyllaries with narrow or broad margins; outer phyllaries leafy, hairy or glabrate, glandular. Ray florets 5–6 mm.

● Stony or soil-covered slopes, roadsides, very common. Gansu, Hebei, Heilongjiang, Liaoning, Nei Mongol, Shaanxi, Shanxi.

The stems with many subequal long branches, smaller leaves, and smaller capitula differ significantly from other varieties.


糙毛阿尔泰狗娃花 cao mao a er tai gou wa hua

Heteropappus altaicus var. hirsutus (Handel-Mazzetti) Y. Ling.

Plants green. Stems ascending or erect, densely spreading and coarsely white hairy, especially upper part, hairs ca. 1 mm or more, few branched from base. Leaves linear-lanceolate or spatulate, spreading coarsely white hairy. Capitula solitary, terminal on branches. Involucres 5–15 mm in diam.; outer phyllaries with narrowly scarious margin; inner with broadly scarious margin, glandular, coarsely white hairy.

● Grasslands, open slopes; 2200–3500 m. W Sichuan (Garzé, Jinchuan, Kangding), NW Yunnan.

This variety is similar to Aster altaicus var. altaicus but differs in having stems white hirsute.


台东阿尔泰狗娃花 tai dong a er tai gou wa hua

Heteropappus altaicus var. taitoensis (Kitamura) Y. Ling.

Plants green, ca. 50 cm tall. Stems branched from base, densely spreading and ascending appressed hairy. Lower leaves withered by anthesis, oblanceolate-linear or linear, 3–6 × 0.1–0.2–0.4 mm, margin entire or remotely toothed; middle leaves 2–3 × ca. 0.1 cm; upper leaves small, similar to phyllaries. Involucres 1.5–1.8 cm in diam.; outer phyllaries leaflike, inner phyllaries with narrowly scarious margin, densely hairy.

● Sandy places by riverbanks. Taiwan (Taidong).


华南狗娃花 hua nan gou wa hua


Herbs, perennial, 15–35 cm tall, taprooted. Stems ascending or decumbent, few branched in upper part, sterile stems short, sparsely to moderately striose or glabrate, sometimes minutely short-stipitate glandular. Leaves sessile, glabrous or adaxial veins sparsely striose, eglandular, margin entire, striose-ciliate, midvein abaxially slightly prominent; lower cauline leaves withered by anthesis; middle leaves narrowly oblanceolate to oblanceolate or spatulate-oblong, 1.5–2.5 × 0.15–0.4 cm, base gradually attenuate, apex rounded; upper leaves smaller, similar to phyllaries, sparsely scabrous; leaves of sterile stems spatulate, 1–1.5 × 0.3–0.4 cm. Capitula solitary at ends of branches or sometimes in corymbiform synflorescences, 2–2.5 cm in diam. Involucres hemispheric, 0.8–1.2 cm in diam.; phyllaries green, 2-seriate, equal or outer phyllaries shorter, lanceolate to linear-lanceolate, 4–5 × 0.5–0.7 mm, abaxially scabrous, margin herbaceous or narrowly (rarely broadly) scarios, erose, scabrous-ciliate, apex acuminate. Ray florets 1-seriate, 15–20, white or pink, tube 2–2.5 mm, sparsely hairy, lamina 8–10.1 × 0.8–1.2 mm; disk florets yellow, 3.3–4 mm, tube 1–1.7 mm, sparsely hairy, limb campanulate, lobes unequal, 1 deep, 0.7–
1.2 mm, hairy. Achenes brownish, obovate, flattened, 2–2.7 mm, scabrous, apically glandular, 2-ribbed. Pappus ca. 2-seriate, reddish or reddish brown, of unequal bristles 2.5–3.3 mm, acute. Fl. and fr. Jul–Sep. \( \text{2n} = 18 \).

Sandy areas by seashores, sandy meadows, grasslands by riversides; sea level to 100 m. Fujian, Guangdong, Hainan [Japan].


半卧狗娃花 ban wo gou wa hua


Herbs, perennial, (3.5–)5–15 cm tall, caespitose; rhizome short. Stems and branches decumbent or ascending, branched from base, sometimes with densely leafy undeveloped branches in leaf axils, reddish, long white strigose, sparsely short-stipitate glandular (particularly upward). Leaves low-oblancoate or oblancoate to spatulate, 1.3–2 \( \times \) 0.2–0.4 cm, densely striate, with sessile glands, or adaxially sparsely striate, base attenuate, margin entire, strigose-ciliate, midvein axially convex, slightly concave adaxially, sometimes basally 3-veined, apex obtuse to acute, mucronate. Capitula radiate, solitary at ends of stems or branches, or sometimes 2 or 3 in corymbiform synflorescences, 1.5–3 cm in diam. Involucres hemispheric, 1–1.5 cm in diam.; phyllaries 3-seriate, green, lanceolate, 6–8 \( \times \) 0.8–1.8 mm, abaxially striate, short-stipitate glandular, outer margin leaflike or narrowly scarious, inner phyllaries broadly scarious, erosive, scabrous- or glandular ciliate, apex acuminulate, often purplish. Ray florets (20–)25–35, blue or purplish, tube 2–2.9 mm, hairy, lamina 1.2–1.5 \( \times \) 0.1–0.2 cm; disk florets yellow, 4–6.3 mm, tube 1.5–2.3 mm, tube and limb sparsely hairy, limb narrowly campanulate, lobes unequal, 1 deep, 5–7.5 mm, hairy. Achenes straw-colored, becoming black mottled or nearly black, obovate, flattened, 1.8–2.5 mm, striate, apically with sessile glands, margin faintly 2-ribbed, long striate. Pappus 2- or 3-seriate, reddish to reddish brown, unequal, 4–5 mm. Fl. Jun–Aug.

Dry open stony, gravelly, or sandy slopes, gravelly and sandy open or shrubby floodplains, alpine meadows, rock outcrops; 3200–4600 m. Qinghai, Xizang, Yunnan.


青藏狗娃花 qing zang gou wa hua

Aster boweri f. annuus Onno; Heteropappus boweri (Hemsley) Grierson.

Herbs, biennial or perennial, 2.5–7 cm tall, from caudex, thickly taprooted, sometimes clad with marcescent leaf bases. Stems solitary or 3–6, simple or branched near base, decumbent or ascending, slender, moderately to densely white hispid, more densely so upward, ± densely stipitate glandular below capitula. Leaves ± densely striate or adaxially glabrate, margin entire, striose-ciliate, basally crowded, shortly winged petiolar or subsessile, narrowly oblancoate to spatulate, 1–3 \( \times \) 0.2–0.4 cm, base clasping, apex acute to obtuse; upper cauline leaves lanceolate to linear, 0.5–0.8 \( \times \) ca. 0.2 cm. Capitula terminal, solitary, 25–30 mm in diam. Involucres hemispheric, 1–1.5(–2) cm in diam.; phyllaries 2- or 3-seriate, subequal, linear to linear-lanceolate, abaxially ± densely striate to villous-striate, herbaceous, margin striate, of inner phyllaries scarious, erose. Ray florets ca. 40, purple, tube 2–3 mm, lamina 9–13 \( \times \) 1.5–1.7 mm; disk florets yellow, 4.5–5 mm, tube ca. 1.5 mm, lobes triangular, hairy, unequal, 4 short, 0.5–0.6 mm, 1 long, 1–1.2 mm. Achenes pale brown and blackish streaked, narrowly obovoid, 2.8–3 mm, sparsely striate. Pappus brownish, 2- or 3-seriate; outer bristles short, 0.5–0.9 mm; inner bristles 4–5.5 mm. Fl. and fr. Jul–Aug.

• Alpine stony and sandy grounds, alpine meadows, montane river floodplains, field margins; 2200–5200 m. W Gansu, Qinghai, Xining, Xizang, Yunnan.


无舌狗娃花 wu she gou wa hua


Herbs, perennial, 5–15 cm tall; caudex short, from woody taproot. Stems procumbent to ascending, many branched, rigid, green or purple tinged, usually branched from base, white striate. Leaves sessile, linear, 0.4–2 \( \times \) 0.1–0.2(–0.4) cm, striose, midvein slightly raised abaxially, margin entire, strigose, apex obtuse, mucronulate; uppermost leaves small. Capitula discoid, terminal, solitary, 8–13 mm in diam.; phyllaries 2- or 3-seriate, green or purple tinged, lanceolate, 5.5–6.5 \( \times \) 1.2–2 mm, striate, margin scarious, apex acuminate. Ray florets absent; disk florets yellow, 4.3–5 mm, tube 1–1.3 mm, limb funnelform, glabrous, lobes triangular to lanceolate, unequal, 0.8–1.2 mm, hairy. Achenes pale yellow-brown, obovoid, compressed, ca. 2 \( \times \) 1 mm, sericeous, margin 2-ribbed. Pappus pale yellow-brown, 2-seriate, of 35–45 unequal bristles 3–3.5 mm. Fl. and fr. Jul–Sep.

• Stony grounds; 3200–3900 m. Xizang.

Aster eligulatus is similar to Heteropappus holohermaphroditus Grierson, described from India, Kashmir, and Pakistan, but differs in having stems branched from the base and capitula terminal, solitary. The differences noted above, however, might stem from phenotypic plasticity: the plants from south of the Himalaya being taller (15–45 cm) and the capitula numerous, borne at the ends of long peduncles. More material and a morphometric study are needed to resolve this issue.


狗娃花 gou wa hua

Aster bataakensis Hayata; A. fusamensis H. Léveillé & Vaniot; A. hispidus var. decipiens (Maximowicz) Y. Ling; A. hispidus var. heterochaeta Franchet & Savatier; A. hispidus var. mesochaeta Franchet & Savatier; A. hispidus var. microphyllus Panpampanini; A. oldhamii Hemsley var. bataakensis (Hayata) Sasaki; A. omerophyllus Hayata; A. rufopappus Hayata; Heteropappus decipiens Maximowicz; H. hispidus (Thunberg) Lessing; H. hispidus f. decipiens (Maximowicz) Komarov; H. hispidus var. decipiens (Maximowicz) Voroshilov; H. incisus Sie-
Herbs, annual or biennial, 30–50(–150) cm tall; taproot vertical, fusiform. Stems solitary or sometimes several fascicled, branched, strigose or hispid, glabrescent in lower part. Leaves thin, sparsely strigose or glabrous, margin ciliate, midvein and secondary veins prominent; basal and lower cauline leaves withered by anthesis, long petiole; blade obovate, 4–13 × 0.5–1.5 cm, attenuate, margin entire or remotely serrate, apex obtuse or rounded; middle leaves oblong-lanceolate or linear, 3–7 × 0.3–1.5 cm, margin often entire; upper leaves reduced in size, linear. Capitula radiate, in broad corymbiform synflorescences, 3–5 cm in diam., long pedunculate. Involucres hemispheric, 7–8 × 10–20 mm; phyllaries 2-seriate, subequal, abaxially strigose, often glandular; outer phyllaries linear-lanceolate, 7–8 × 10–20 mm; phyllaries 2-seriate, subequal, abaxially crenate; involucral bracts 3–5 cm in diam., long pedunculate. Involucres hemispheric, 13–18 mm in diam.; phyllaries 2- or 3-seriate, leaflike, linear-lanceolate, 7–8 mm, apex acuminat, hispid, glandular, inner margin scarious in lower part. Ray florets blue-purple, tube ca. 1.8 mm, lamina linear-oblong, 14–17(–27) × 2–2.5 mm, apex 3-toothed or entire; disk florets yellow, ca. 5 mm, tube 1–1.5 mm, sparsely hairy, lobes unequal, 0.8–1.2 mm. Achenes of ray florets narrow, sterile, of disk oblong-obovate, compressed, densely silky. Pappus of ray florets few, short or sometimes absent, of disk florets reddish to reddish brown, of 25–35 bristles, 2–4.4 mm, unequal. Fl. Aug–Sep.

Sand riverbanks, sandy hillside forest understories, grasslands on slopes; above 800 m. NE Gansu, Hebei, Heilongjiang, Jilin, NE Mongolia, Shanxi, Shandong, Shaanxi, Taiwan, Fujian, Gansu, Hebei, Heilongjiang, Jilin, NE Mongolia, Shanxi [Japan, Korea, E Russia].

This species is very decorative due to the presence of numerous large capitula.


Herbs, biennial, 20–40 cm tall. Stems erect, usually solitary, rarely 2- or 3-fascicled, branched in upper part, branches ascending, purplish or reddish, strigose to hisrate, glandular or not. Lower cauline leaves deciduous by anthesis; middle leaves lanceolate to linear-lanceolate, sometimes linear, 2–5 × 0.2–0.5 cm, strigose, eglandular or sparsely minutely glandular, margin long strigose-ciliate, apex acuminate; uppermost leaves reduced. Capitula terminal, solitary on branches, forming open corymbiform synflorescences, 25–40 mm in diam. Involucres hemispheric, 1.2–2 cm in diam.; phyllaries linear-lanceolate to lanceolate, 8–11 mm, abaxially strigose, in conspicuously glandular in lower half, margin scarious, ciliate, apex acuminate. Ray florets blue or blue-lilac, tube 2.5–3 mm, sparsely hairy, lamina 14–28 × 2–2.2 mm; disk florets yellow, sparsely hairy (tube and limb), 3.7–5 mm, tube 1.2–1.8 mm, limb narrowly campanulate, lobes lanceolate, unequal, 0.6–0.8(–1.5) mm. Achenes obvoid, (immature) ca. 2 mm, strigillose. Pappus reddish brown to yellowish, of ray and disk florets ± equal, 3–5 mm. Fl. Jul–Aug.

Forest margins, grasslands, roadsides; sea level to 2400 m. Anhui, Fujian, Gansu, Hebei, Heilongjiang, Hubei, Jiangsu, Jiangxi, Jilin, NE Mongolia, Shaanxi, Shaanxi, Shandong, Shanxi, N, NE, and NW Sichuan, Taiwan, Zhejiang [Japan, Korea, Mongolia, E Russia].


Herbs, annual, 35–50 cm tall. Stems erect, strigate, densely strigose or hispid, strigillose, usually branched from middle, branches ascending. Leaves: basal and lower cauline withered by anthesis; middle leaves lanceolate to linear-lanceolate, sometimes linear, 2–5 × 0.2–0.5 cm, strigose, eglandular or sparsely minutely glandular, margin long strigose-ciliate, apex acuminate; uppermost leaves reduced. Capitula terminal, solitary on branches, forming open corymbiform synflorescences, 25–40 mm in diam. Involucres hemispheric, 1.2–2 cm in diam.; phyllaries linear-lanceolate to lanceolate, 8–11 mm, abaxially strigose, in conspicuously glandular in lower half, margin scarious, ciliate, apex acuminate. Ray florets blue or blue-lilac, tube 2.5–3 mm, sparsely hairy, lamina 14–28 × 2–2.2 mm; disk florets yellow, sparsely hairy (tube and limb), 3.7–5 mm, tube 1.2–1.8 mm, limb narrowly campanulate, lobes lanceolate, unequal, 0.6–0.8(–1.5) mm. Achenes obvoid, (immature) ca. 2 mm, strigillose. Pappus reddish brown to yellowish, of ray and disk florets ± equal, 3–3.5 mm. Fl. Jul–Aug.

Forest understories on sandy hills, sandy riverbanks. Hebei, NE Mongolia, Shaxi [Mongolia, E Russia (European part, Siberia)].


Herbs, biennial or perennial, 15–70 cm tall; taproot woody. Stems procumbent or ascending, branched from base, sparsely to moderately strigose or glabrate. Leaves: basal petiole 1.5–3 cm; blade spatulate, 3–6 × 1–1.5 cm, thick, glabrate or sparsely villous, base cuneate to attenuate, margin entire or sometimes remotely serrate, scabrous-ciliate, apex rounded to acute; lower and basal cauline leaves withered by anthesis; middle and upper leaves oblanceolate-oblong, 1.2–2.5 × 0.2–0.6 cm, glabrous or sometimes sparsely strigose, base attenuate, margin scabrous-ciliate, apex rounded to acute. Capitula solitary at ends of branches, 25–30 mm in diam., peduncle apex dilated; bracts leaflike, surrounding capitulum. Involucres patelliform, 1.2–1.5 cm in diam.; phyllaries 2-seriate, lanceolate, 7–8 × 1–1.5 mm, sparsely scabrous or glabrous, margin scabrous-ciliate, apex acuminated. Ray florets bluish or whitish, tube ca. 1.5 mm, lamina linear-oblong, ca. 1.2 × 0.25 mm; disk florets yellow, 4–5 mm, tube 1.3–1.5 mm, limb funnelform, enlarged, sparsely hairy at base, lobes unequal, triangular, ca. 0.7 mm. Achenes yellowish brown, obovoid, compressed, 2.5–3 mm, strigose, 2- or 3-ribbed. Pappus 1-seriate, of ray florets sordid, basally connate scales ca. 1 mm, of disk florets brownish, numerous, rigid bristles 3–4.2 mm.

Sandy seashores; near sea level. Zhejiang (Putuo) [Japan].


台北狗娃花 tai bei gou wa hua

Heteropappus hispidus (Thunberg) Lessing subsp. oldhamii (Hemsley) Kitamura; H. oldhamii (Hemsley) Kitamura.

Herbs, biennial, 50–60 cm tall, taprooted. Stems erect, solitary, branched only above, sparsely to densely strigose, stipitate glandular upward. Leaves strigose, with sessile glands; basal leaves rosulate, withered by anthesis; cauline leaves remote; lower cauline leaves shortly winged petiolar; blade oblanceolate, oblong, or spatulate, 2–10 × 0.5–1.6 cm, base attenuate to cuneate, margin entire or ± crenate, apex obtuse or rounded; middle leaves sessile, smaller, base sometimes ± rounded, margin often entire; upper leaves small, linear-oblanceolate or -oblong. Capitula solitary, terminal on branches, sometimes forming ± corymbiform synflorescences, 20–25 mm in diam. Involucres hemispheric, 1.1–1.5 cm in diam.; phyllaries 3-seriate, sometimes purplish tinged, subequal, linear or linear-oblanceolate, 5–8 × 0.6–1.5 mm, abaxially sometimes scabrous or sparsely villous, ± stipitate glandular, margin scabrous-ciliate or glandular, outer phyllaries leaflike, inner phyllaries margin scarios. Ray florets 35–40, mauve or blue, tube 1.2–1.8 mm, glabrous or hairy, lamina 8–12 × 1.6–2.4 mm; disk florets yellow, 4.2–4.8 mm, tube 1–2 mm, glabrous or hairy, limb ± narrowly campanulate, lobes lanceolate, unequal, 0.5–1.5 mm, hairy. Achenes pale greenish brown to pale brownish mottled black or black mottled to black, obovoid, 2.2–3.8 mm, 2-ribbed marginally, sparsely strigose, sparsely apically glandular. Pappus of ray florets often few and short, sometimes absent or equaling that of disk, of disk 2-seriate, straw-colored or brownish, of unequal bristles 2.9–4.2 mm. Fl. and fr. May–Oct.

Open disturbed slopes, pebbly-sandy river floodplains, riverbanks, alpine or montane meadows, Juniperus slopes, montane woodlands, fields, roadsides; 1200–4100 m. Gansu, Hebei, Ningxia, Qinghai, Shaanxi, Sichuan, E Xizang, NW Yunnan [Nepal].


拉萨狗娃花 la sa gou wa hua

Aster crenatifolius var. subracemosus Handel-Mazzetti; Heteropappus crenatifolius (Handel-Mazzetti) Grierson.

Herbs, annual or biennial, 10–60 cm tall, taprooted. Stems erect, solitary, branched only above, sparsely to densely strigose, stipitate glandular upward. Leaves strigose, with sessile glands; basal leaves rosulate, withered by anthesis; cauline leaves remote; lower cauline leaves shortly winged petiolar; blade oblanceolate, oblong, or spatulate, 2–10 × 0.5–1.6 cm, base attenuate to cuneate, margin entire or ± crenate, apex obtuse or rounded; middle leaves sessile, smaller, base sometimes ± rounded, margin often entire; upper leaves small, linear-oblanceolate or -oblong. Capitula solitary, terminal on branches, sometimes forming ± corymbiform synflorescences, 20–25 mm in diam. Involucres hemispheric, 1.1–1.5 cm in diam.; phyllaries 3-seriate, sometimes purplish tinged, subequal, linear or linear-oblanceolate, 5–8 × 0.6–1.5 mm, abaxially sometimes scabrous or sparsely villous, ± stipitate glandular, margin scabrous-ciliate or glandular, outer phyllaries leaflike, inner phyllaries margin scarios. Ray florets 35–40, mauve or blue, tube 1.2–1.8 mm, glabrous or hairy, lamina 8–12 × 1.6–2.4 mm; disk florets yellow, 4.2–4.8 mm, tube 1–2 mm, glabrous or hairy, limb ± narrowly campanulate, lobes lanceolate, unequal, 0.5–1.5 mm, hairy. Achenes pale greenish brown to pale brownish mottled black or black mottled to black, obovoid, 2.2–3.8 mm, 2-ribbed marginally, sparsely strigose, sparsely apically glandular. Pappus of ray florets often few and short, sometimes absent or equaling that of disk, of disk 2-seriate, straw-colored or brownish, of unequal bristles 2.9–4.2 mm. Fl. and fr. May–Oct.
Miyamayomena identified in molecular phylogenies (Brouillet et al., loc. cit.), where it appeared to be sister to members of aster and often appearing spongy on the surface; some species are glabrous, but most are hairy with minutely stipitate glands that are often (but not necessary to determine the monophyly and limits of this group.

have a caducous pappus (Rhynchospermum always) found in shallow pits and produce an abundance of resin, making the surface or parts of the surface vernicose. Some members of the group North American 589–629. 2009). The separation of species of Gymnaster Kitamura (1937), not F. Schütt (1891) [Algae]; Kitamuraea Rauschert; Kitamuraaster Sojak; Leptocoma Lessing; Miyamayomena Kitamura; Rhynchospermum Reinwardt; Zollingeria Schultz Bipontinus.

Herbs, perennial, usually simple, sometimes branched, erect. Leaves basal (withered at anthesis) and cauline; blade spatulate or ovate to narrowly ovate or lanceolate, sometimes pandurate, margin flat, entire or serrate to coarsely serrate, 1-veined (rarely 3-veined). Capitula radiate, rarely discoid, terminal, numerous, in corymbiform synflorescences, rarely few, rarely solitary at ends of branches or in leaf axils. Involucres hemispheric, or obconic, to cylindric-campanulate; phyllaries 3–7-seriate, unequal, 4 short, 0.6–0.9 mm, 1 long, 1.1–1.3 mm, glabrous. Achenes of ray florets pale olive green and black mottled to black, obovoid, ± compressed, 2–2.5 × 1–1.2 mm, strigose, sparsely glandular apically, faintly 2- or 3-ribbed; of disk florets straw-colored, ± black mottled, obvolute to oblongateolate, flattened, 2.2–2.3 mm, strigose, markedly 2-ribbed. Pappus of ray florets 1-seriate, scales 0.3–0.5 mm; of disk florets 2-seriate, reddish; outer bristles ca. 0.5 mm; inner bristles ± stiff, 3.3–3.7 mm. Fl. and fr. Jun–Sep.

Open grassy slopes, disturbed open or bare slopes in alpine meadows, sometimes sandy soils and riverbanks, field margins; 2900–5600 m. Qinghai, Xizang [Bhutan, India (Sikkim)].

6. Aster sect. Aster

紫苑组 zi wan zu

Gymnaster Kitamura (1937), not F. Schütt (1891) [Algae]; Kitamuraea Rauschert; Kitamuraaster Sojak; Leptocoma Lessing; Miyamayomena Kitamura; Rhynchospermum Reinwardt; Zollingeria Schultz Bipontinus.


A hitherto unrecognized group of species within Aster sect. Aster (formerly part of A. sect. Orthomeris, see Y. Ling & Y. L. Chen, loc. cit.) was identified in molecular phylogenies (Brouillet et al., loc. cit.), where it appeared to be sister to members of A. sect. Alpigeni. The group also includes Miyamayomena and Rhynchospermum. Morphologically, it is characterized by distally unreduced or slightly reduced cauline leaves that are abaxially pale and often appearing spongy on the surface; some species are glabrous, but most are hairy with minutely stipitate glands that are often (but not always) found in shallow pits and produce an abundance of resin, making the surface or parts of the surface vernicose. Some members of the group have a caducous pappus (Rhynchospermum) or have lost the pappus of ray and/or disk achenes (Miyamayomena). Further phylogenetic work is necessary to determine the monophyly and limits of this group.

1a. Leaf surfaces (both) glabrous (sometimes abaxial veins sparsely strigillose), eglandular; leaves thick, margin revolute.

2a. Capitula solitary in leaf axils or terminal, overall forming a paniculose-corymbiform synflorescence; pappus dirty white .............................................................. 65. A. hunanensis

2b. Capitula in corymbiform synflorescences; pappus reddish or yellowish.

3a. Leaves abaxially with 3 or 4 pairs of lateral veins joining to form a raised submarginal vein on each side; achenes 4-ribbed; pappus reddish .............................................................. 49. A. dolichophyllus

3b. Leaves with lateral veins 2- or 3-paired; achenes 2-ribbed; pappus yellowish ............................................. 50. A. moupinensis

1b. Leaf abaxial and/or adaxial surfaces hairy or glandular; leaves thick or thin, margin flat or revolute.

4a. Abaxial leaf surface minutely stipitate glandular in pits.

5a. Pappus absent in all achenes, or absent in ray and of scales in disk achenes.

6a. Disk pappus of short scales .............................................................. 58. A. piccolii

6b. Disk pappus absent.

7a. Ray achenes long beaked .............................................................. 64. A. verticillatus

7b. Ray achenes not beaked.

8a. Achenes inconspicuously ribbed; leaf margin entire.

9a. Stems and leaves hispidulous-villous; middle leaves oblong-lanceolate or subelliptic, 1.5–2.5(–4) × 0.3–0.6(–0.9) cm; ray florets ca. 16 mm ........................................................................ 60. A. pseudosimplex
9b. Stems hirsutulous, leaves strigose; middle leaves lanceolate-ovate to narrowly oblong or linear, 1–3 × 0.1–0.6 cm; ray florets 5–7 mm ................................................................. 61. *A. lixianensis*

8b. Achenes 2–4-ribbed; leaf margin ± serrate or crenate.
10a. Leaf margin coarsely serrate to serrate ................................................................. 59. *A. yuanquensis*
10b. Leaf margin remotely serrate, serrulate, or obscurely repand-crenate.
11a. Middle leaf blades oblanceolate to narrowly lanceolate, margin remotely serrate to serrulate ................................................................. 62. *A. sinoangustifolius*
11b. Middle leaf blades ovate, broadly elliptic, or obovate, margin obscurely repand-crenate ......... 63. *A. lushiensis*

5b. Pappus present in all achenes.
12a. Ray achenes long beaked .................................................................................. 64. *A. verticillatus*
12b. Ray achenes not beaked.
13a. Phyllary abaxially with midvein plus 3–7 dark green striae; peduncle bracts crowded below head, often grading into phyllaries ........................................................................ 73. *A. falcifolius*
13b. Phyllary without dark green striae; peduncle bracts not grading into phyllaries.
14a. Capitula terminal, solitary (rarely 2) on branches .............................................. 69. *A. mollissimus*
14b. Capitula few to many (rarely 1) in terminal corymbiform synflorescences.
15a. Involucres cylindric-campanulate.
16a. Ray florets purple .................................................................................... 55. *A. alatipes*
16b. Ray florets white.
17a. Phyllaries 3- or 4-seriate; leaf blade ovate, base cordate ........................................ 48. *A. formosanus*
17b. Phyllaries 5–7-seriate; leaf blade obovate to oblanceolate, base attenuate ............... 51. *A. taiwanensis*
15b. Involucres campanulate to hemispheric.
18a. Phyllaries 3- or 4-seriate, unequal.
19a. Ray florets purple .................................................................................... 36. *A. veitchianus*
19b. Ray florets white.
20a. Lower leaf margin coarsely 3- or 4-serrate distally, teeth pointing forward ............ 53. *A. taoyuenensis*
20b. Lower leaf margin crenate-serrate ................................................................. 57. *A. morrisonensis*
18b. Phyllaries 2- or 3-seriate, subequal.
21a. Ray florets 10–14; capitula 1–10 ........................................................................ 54. *A. homochlamydeus*
21b. Ray florets 25–35(–60); capitula 10 to numerous.
22a. Ray florets 30–35(–60); achenes 4-ribbed ......................................................... 70. *A. sikkimensis*
22b. Ray florets 25–30; achenes 2-ribbed ............................................................... 72. *A. nigromontanus*

4b. Abaxial leaf surface eglandular or glandular (but not in pits).

23a. Subshrubs or woody perennial herbs.
24a. Phyllaries 3-seriate, unequal to subequal; leaf blades lanceolate, 4–7.5[–10] cm; ray florets 21–25 ...... 46. *A. smithianus*
24b. Phyllaries 4- or 5-seriate, unequal; leaf blades linear-oblong, oblong, or oblong-lanceolate to elliptic, 0.5–2.5(–3) cm; ray florets 10–20.
25a. Leaf and phyllary surfaces strigose, villous; involucres cylindric-campanulate; phyllaries ± leaflike .................................................................................................................. 42. *A. poliothamnus*
25b. Leaf and phyllary surfaces densely velutinous; involucres hemispheric; phyllaries membranous .......... 43. *A. sikuensis*

23b. Herbs perennial.
26a. Phyllaries 2- or 3-seriate, subequal, outer usually leaflike (if sometimes unequal then outer leaflike).
27a. Ray florets purple, mauve, pink, or blue; achenes obovoid.
28a. Involucres hemispheric; ray florets 50–60 ..................................................................... 44. *A. taliangshanensis*
28b. Involucres campanulate to broadly campanulate; ray florets 13–30.
29a. Leaf blade broadly ovate or oblong to lanceolate, base cordate or rounded, margin coarsely serrate to serrate; achenes 4-ribbed, pappus red-brown; disk corolla limb funnelform ............................................. 34. *A. fuscescens*
29b. Leaf blade oblong-lanceolate, base attenuate to cuneate or rounded, margin entire or serrulate to serrate or coarsely serrate; achenes 2-ribbed, pappus dirty white or straw-colored; disk corolla limb campanulate.
30a. Ray florets mauve or pink; pappus dirty white; leaf surfaces scabridulous ..................... 31. *A. indamellus*
30b. Ray florets blue; pappus straw-colored; leaf abaxially villosulous, adaxially stiffilloose ...... 39. *A. trichoneurus*
27b. Ray florets white; achenes oblong or oblong-lanceolate, rarely obovoid.
31a. Herbs scapiform; leaves basal, rosulate; capitula 1 or 2, terminal ..................................... 68. *A. itsunboshi*
31b. Herbs erect; leaves cauline; capitula 2 to numerous in terminal corymbiform synflorescences (rarely solitary).
32a. Middle leaf base auriculate, clasping; ray florets 18–30 .............................................. 35. *A. auriculatus*
32b. Middle leaf base cuneate, rounded, or attenuate; ray florets 10–20.
33a. Leaf base cuneate to rounded, apex obtuse or rounded, margin revolute, entire .......... 40. *A. mangshanensis*
33b. Leaf base attenuate, apex acute to acuminate, margin flat, ± serrate or entire.
34a. Leaf blade ovate to ovate-lanceolate, midvein prominent
34b. Leaf blade oblong-lanceolate, trilobed
35a. Leaf margin revolute, entire or ± serrate.
36a. Pappus white or dirty white (innermost reddish).
37a. Middle leaf blade oblanceolate to ovate, base cuneate-rounded to rounded; ray florets white; pappus dirty white (innermost reddish)
37b. Middle leaf blade narrowly lanceolate to linear-lanceolate, base attenuate; ray florets blue-purple; pappus white
38a. Middle leaf abaxial surface tomentose; phyllaries 3-seriate
38b. Middle leaf abaxial surface velutinous or moderately scabridulous, strigose; phyllaries 4–6-seriate.
39a. Middle leaves sessile or shortly petiolate, blade lanceolate, abaxially velutinous
39b. Middle leaves winged petiolate, blade ovate to linear-obovate, abaxially moderately scabridulous, strigose, minutely stipitate glandular
40a. Ray florets white.
41a. Abaxial leaf surface moderately scabrous or moderately strigose, adaxial surface scabrous, margin serrate or serrulate; phyllaries 5–7-seriate.
42a. Middle leaf blade pandurate or ovate to ovate-lanceolate, base truncate or rounded to auriculate-clasping; capitula 1–10 in racemiform synflorescences; involucres 10–12 mm
42b. Middle leaf blade narrowly ovate to lanceolate, base attenuate to rounded; capitula numerous in corymbiform to paniculiform synflorescences; involucres 6–7 mm
43a. Middle leaf blade oblanceolate to ovate or lanceolate, base attenuate or
43b. Middle leaf blade ovate, base rounded
44a. Middle leaf blade cordate, reniform, or subrounded, cordate-ovate
44b. Middle leaf blade pandurate or ovate to ovate-lanceolate, lanceolate, or linear-lanceolate.
45a. Middle and upper leaves petiolate; disk corolla limb funnelform, lobes lanceolate; achenes lanceoloid
45b. Middle and upper leaves winged petiolate or sessile; disk corolla limb campanulate, lobes narrowly triangular; achenes obovoid.
46a. Phyllaries 5– or 6-seriate; involucres 10–12 mm
46b. Phyllaries 3– or 4-seriate; involucres 4–10(–12) mm.
47a. Involucres 7–10(–12) mm.
48a. Middle leaf blade ovate or pandurate to lanceolate-pandurate, base attenuate or auriculate, claspig
48b. Middle leaf blade oblanceolate to ovate or lanceolate, base attenuate.
49a. Leaf midvein prominent; phyllary apex acute or acuminate; ray florets 14–30; achenes 4–6-ribbed
49b. Leaf 3-veined; phyllary apex obtuse to rounded; ray florets 30–40; achenes 2-ribbed
50a. Middle leaves sessile, blade lanceolate to linear-lanceolate, apex acuminate; pappus white
50b. Middle leaves winged petiolate or sessile, blade ovate or pandurate to lanceolate-pandurate or elliptic to oblanceolate, apex obtuse or acute; pappus reddish.
51a. Middle leaf blade ovate or pandurate to lanceolate-pandurate
51b. Middle leaf blade ovate to elliptic or oblanceolate


Aster pseudamellus J. D. Hooker, Fl. Brit. India 3: 249. 1881, not Wenderoth (1831). Herbs, perennial, 11–50 cm tall, from woody caudices, rhizomatous. Stems erect or ascending, simple, reddish strigillose, minutely stipitate glandular. Leaves cauleine, gradually increased in size upward; lowest leaves withered by anthesis, sessile, oblanceolate, scabridulous, minutely stipitate glandular, (sometimes glabrous), margin entire or 1–7-serrulate to coarsely ser-
rate, scabridulous-ciliate, midvein slightly prominent adaxially, apex acute, mucronulate; middle to upper leaves oblanceolate, 1.6–4(–6) × 0.4–1.7(–2) cm, base attenuate to cuneate; synflorescence leaves oblanceolate, 1.4–1.6 × 0.2–0.4 cm. Capitula 1–20 in terminal, corymbiform to paniculate-corymbiform synflorescences, rarely solitary; peduncles 30–70 mm, strigillose; bracts oblanceolate, entire, upper bracts closely subterminal capitula. Involute campanulate, 5–7 mm; phyllaries 2- or 3-seriate, subequal, base hardened, margin erose, ciliate, green in distal 1/3, conspicuous midvein slightly translucent; outer phyllaries narrowly to broadly lanceolate, 5–6 × 1.5–2.5 mm, midvein sparsely to moderately strigillose, proximally minutely stipitate glandular, both surfaces densely so upward, leaflike distally, margin narrowly scarious, apex somewhat spreading, acute, ciliate; middle phyllaries oblong, 5–6 × 1.3–1.8 mm, abaxially proximally sparsely and distally densely minutely stipitate glandular, leaflike in distal 1/4 to only tip, margin ± broadly scabridulous, apex obtuse, mucronate, distal margin and apex purplish; inner phyllaries linear-oblong, 6–7 × 0.8–1 mm, scarios, apex sometimes purplish. Ray florets 25–30, blue, mauve, or pink, tube sparsely strigillose, lamina 13–16 × 1–2 mm, eglandular; disk florets yellow, 4.5–5 mm, tube apex and limb base sparsely strigillose, sparsely minutely stipitate glandular, limb campanulate, 2.5–3 mm, lobes erect, tip spreading, triangular to narrowly triangular, 1.2–1.5 mm, sparsely strigillose, eglandular. Achenes obvoid, ± compressed, 3–3.5 mm, sparsely to moderately strigillose, sparsely minutely stipitate glandular apically, 2-ribbed. Pappus 3-seriate, dirty white, of slender, barbellate bristles; outer bristles 0.3–1.1 mm; inner bristles 3–3.5 mm, tapering; innermost bristles 4.5–5 mm, tapering. Fl. and fr. Jul–Sep.

Alpine and subalpine open forests on grassy slopes, rock crevices, screes; 1900–4200 m. W Xizang (Yangsí) [Afghanistan, NW India, Kashmir, Nepal, Pakistan].

Aster indamellus is closely related to A. amellus Linnaeus but differs in having outer phyllaries leaflike, distinctly veined, acute at apex, with broader tips, and by often being glandular. Native to the area from Europe to W Siberia, A. amellus is sometimes cultivated in China.


紫苑 yuán bāo zi wán

Aster nakaii H. Léveillé & Vaniot; A. tataricus var. nakaii (H. Léveillé & Vaniot) Kitamura; A. trinervius Roxburgh ex D. Don var. longifolius Franchet & Savatier.

Herbs, perennial, 11–150 cm tall; rhizomes becoming woody; stemless rosettes often present. Stems erect, simple, ribbed, glabrata proximally to sparsely strigillose distally, minutely stipitate glandular below leaves. Leaves cauline, much reduced upward, scabridulous, abaxially sparsely minutely stipitate glandular, margin scabridulous-ciliate, midvein prominent abaxially, apex acuminate to acute or rounded, mucronate; lowest leaves withered by anthesis, long, slightly winged petiolate (petiole to 30 cm), petiole base sheathing; blade oblongolate to ovate, (2.1–)30–50 × (0.9–)6–12 cm, base attenuate, margin undulate, coarsely serrate, veins pinnately 6–10-paired; lower to upper leaves shortly petiolate (base sheathing) or sessile, oblanceolate to lanceolate, 2–18 × 0.6–5 cm, base attenuate, margin coarsely serrate to serrulate or entire; synflorescence leaves lanceolate, 1.3–7 × 0.2–1 cm. Capitula (2–)5–50 or more, in terminal corymbiform synflorescences; peduncles 25–65 mm, sparsely strigillose, moderately to densely minutely stipitate glandular; bracts linear-lanceolate, entire, sometimes grading into phyllaries. Involucres campanulate, 7–10(–12) mm; phyllaries 3-seriate, unequal, green along midvein, membranous, base ± hardened, margin erose, ciliate, midvein ± pronounced, slightly translucent; outer phyllaries narrowly lanceolate, 4.5 × 0.8–1 mm, sparsely strigillose, distally sparsely minutely stipitate glandular, sometimes ± leaflike, margin narrowly scarious, apex acute, ciliate, tip purplish; middle phyllaries oblong to lanceolate-oblong, 6–7 × 1 mm, abaxially glabrous to sparsely strigillose distally or along midvein, eglandular or very sparsely glandular, margin scarios, apex acuminate, sometimes mucronate, distal margin and apex purplish; inner phyllaries linear-lanceolate to linear-oblong, 8–10 × 0.6–1 mm, glabrous, sparsely minutely stipitate glandular, margin scarios, apex acuminate, erose, purplish. Ray florets 14–30, blue or pale lavender or to purple, lamina 7–15 × 1.5–2.5 mm, glabrous, eglandular; disk florets yellow, 5–7 mm, limb campanulate, 3.5–4 mm, lobes erect, tip spreading, narrowly triangular, ca. 2 mm, glabrous, eglandular. Achenes dark, obvoid, slightly compressed, 2.5–3 mm, sparsely to moderately strigillose, sparsely minutely stipitate glandular apically, 4.6-ribbed. Pappus 4-seriate, reddish, of barbellate bristles; outermost bristles few, slender, 0.2–0.3 mm; outer bristles slender 1.5–2 mm; inner bristles 4.5–5 mm, tapering; innermost bristles 6–7 mm, slightly clavate. Fl. Jul–Sep, fr. Aug–Oct. 2n = 54.

Shaded damp places, meadows, steppes, damp riverbanks; 400–3300 m. Anhui, Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan [Japan, Korea, Mongolia, Russia].

The roots of Aster tataricus are used medicinally to relieve coughs and reduce sputum.


圆苞紫苑 yuán bāo zi wán

Aster horridifolius H. Léveillé & Vaniot; A. kodzumamus Makino.

Herbs, perennial, 40–90 cm tall, rhizomatous. Stems erect, simple, reddish striate, sparsely scabridulous upward, sparsely minutely stipitate glandular below leaves, more so distally. Leaves cauline, gradually increased in size upward; lowest leaves withered by anthesis, sessile, (blade shape not observed), sparsely to densely scabridulous, minutely stipitate glandular, very sparsely so adaxially, margin serrate to serrulate, scabridulous-ciliate, 3-veined, midvein prominent adaxially, apex acute or sometimes obtuse, mucronulate; lower to upper leaves lanceolate, 4–11 × 0.7–2 cm, base attenuate; synflorescence leaves lanceolate, 2.6–5 × 0.5–1.5 cm, margin serrulate to entire. Capitula (1 or)2–10 or more, in terminal corymbiform synflorescences, rarely solitary; peduncles 20–80 mm, moderately to densely scabridulous, minutely stipitate glandular; bracts nar-
rowly ovate, entire, upper bracts closely subtending capitula. Involutecs broadly campanulate, 7–9 mm; phyllaries 3-seriate, unequal, base hardened, abaxially glabrous, eglandular or sparsely minutely stipitate glandular, margin scarious, erose, leaflike in distal 1/3, ciliate, midvein slightly translucent, apex obtuse to rounded, ciliate; outer phyllaries lanceolate to oblong, 2–4 × 0.9–1.1 mm, abaxially minutely stipitate glandular distally, midvein sparsely to moderately strigilllose; middle phyllaries oblong, 6–7 × 1.2–1.3 mm, distal margin and apex purplish; inner phyllaries linear-oblong, 9.5–10 × 1–2 mm, scarious, apex purplish. Ray florets 30–40, purple, tube sparsely hairy, lamina 15–18 × ca. 1.5 mm, eglandular; disk florets yellow, ca. 7 mm, tube and limb base sparsely hairy, sparsely minutely stipitate glandular, limb campanulate, ca. 4 mm, lobes spreading, tip recurved, triangular to narrowly triangular, 1.2–1.5 mm, sparsely strigilllose apically, eglandular. Achenes purplish, base narrowly triangular, 1.5–1.7 mm, purple tinged, glabrous or sparsely villous, margin scarious, 4-ribbed. Pappus 4-seriate, of red-brown, slender, barbellate bristles; outermost bristles 0–2, ca. 0.5 mm; outer bristles many, 1.2–4 mm; inner bristles 4–5.5 mm, tapering; innermost bristles 6–9, 7–8 mm, slightly clavate. Fl. Jul.–Oct, fr. Aug.–Dec.

Damp forests, damp grasslands, mountain meadows; 400–1000 m. Heilongjiang, Jilin, Liaoning, Nei Mongol, S Ningxia [Japan, Korea, E Russia].

34. Aster fuscescens

He mao zi wan

Aster fuscescens Bureau & Franchet, J. Bot. (Morot) 5: 49. 1891.

34a. Aster fuscescens var. oblongifolius

Aster fuscescens (yuan bian zhong)

34b. Aster fuscescens var. scaberoides

Aster doronicifolius H. Léveillé.

Stems to 60 cm tall, robust, base 4–6 mm in diam., pubescent, glandular. Lower cauline leaves broadly ovate; lowermost leaves (withered by anthesis): petiole to 12 cm; blade 7–12 × 6.5–10 cm; middle leaves: petiole to 12 cm, smaller; uppermost leaves sessile, ovate-lanceolate, sparsely villous or glabrate, sparsely glandular, thin and soft, reticulate veins hardly prominent. Phyllaries villous, short-stipitate glandular.

W Sichuan, SE Xizang, NW Yunnan [NE Myanmar].


Shao mao he mao zi wan

Aster doronicifolius (yuan bian zhong)

34a. Aster fuscescens var. scaberoides

Stems to 45 cm tall, slender, base ca. 4 mm in diam., glabrescent below, brownish pubescent above, sometimes short-stipitate glandular. Lower cauline leaves: petiole to 15 cm; blade broadly ovate, 3–6.5 × 3–6 cm, base ciliate; upper cauline leaves sessile, narrower, ovate or lanceolate, adaxially sparsely to moderately villous, sparsely to moderately glandular, reticulate veins prominent on both surfaces. Phyllaries glabrous.

- E Xizang, NW Yunnan.


- E Xizang (Qamdo) [N Myanmar].


- Open forests, mixed forests, thickets, grasslands; 800–3000 m. Gansu, Guangxi, Guizhou, Hubei, Sichuan, Xizang (Zayü), Yunnan.

Aster auriculatus, especially the roots, is used medicinally to reduce phlegm and treat snakebites.


- Open forests, 6–40 cm tall; rhizomes long, thin. Stems erect, simple, slender, striate, sparsely villous (crosswalls brown), sparsely minutely stipitate glandular distally. Leaves cauline, abruptly reduced upward, abaxially pale green, adaxially green, abaxially sparsely pilose on midvein and distally, sparsely minutely stipitate glandular in shallow pits, adaxially moderately pilose, very sparsely minutely stipitate glandular, margin serrate to serrulate (teeth mucronate), pilose-ciliolate, midvein slightly prominent abaxially, apex mucronate; lowest leaves present and dominant at anthesis, long petiolate (petiole to 7 cm); blade spatulate or obovate to oblanceolate, 1.5–9 × 0.8–3.8 cm, base attenuate, apex rounded to obtuse; lower to middle leaves sessile, pandurate, 4.8–5 × 0.9–1.7 cm, base auriculate, clasping, margin entire; upper leaves sessile, lanceolate to linear-lanceolate, 2.5–4 × 0.3–1 cm, base auriculate, clasping; synflorescence leaves few, linear-lanceolate, 0.8–2 × 0.1–0.5 cm, base ± auriculate, margin entire. Capitula 1–10 in terminal corymbiform synflorescences, sometimes solitary; peduncles 3.5–10 cm, pilose, striigillose, sparsely to moderately minutely stipitate glandular; bracts linear, entire, upper bracts closely subtending capitula and grading into phyllaries. Involucres hemispheric, 6–8 mm; phyllaries 3-seriate, unequal, green apically, glabrous, base ± hardened, margin broadly scarious, erose, purplish, ciliolate, midvein more pronounced distally, ± translucent, apex acuminate, sometimes erose, purplish, ciliolate; outer phyllaries lanceolate, 3–4 × 0.6–1 cm, (outermost tip recurved, ciliate, minutely stipitate glandular); middle and inner phyllaries membranous, often multiveined; middle phyllaries oblongate, 5.5–6.5 × 1.2–1.3 mm; inner phyllaries lanceolate, 6.5–7 × ca. 1 cm. Ray florets 35–54, purple, tube hairy, lamina 9–10 × 1–1.5 mm, eglandular; disk florets yellow, 4.5–5.5 mm, tube base flared, tube apex and limb base striigillose, eglandular, limb campanulate, 2.8–3 mm, lobes spreading, narrowly triangular, 2.1–2.3 mm, glabrous, eglandular. Achenes oblong, slightly compressed, 2–2.5(–3) mm (immature), sparsely striigillose, minutely stipitate glandular, 2-ribbed. Pappus 3-seriate, ± reddish, of barbellate bristles; outermost series of white scales, 0.4–0.6 mm; inner bristles 4–4.6 mm, tapering; innermost bristles 5–5.2 mm, weakly clavate. Fl. May–Jun, fr. Jun–Aug.

- Shaded damp places, ravines, canal sides on slopes; 800–2400 m. C and W Sichuan.


- Open forests, 6–40 cm tall; rhizomes long, thin. Stems erect, simple, slender, striate, sparsely villous (crosswalls brown), sparsely minutely stipitate glandular distally. Leaves cauline, abruptly reduced upward, abaxially pale green, adaxially green, abaxially sparsely pilose on midvein and distally, sparsely minutely stipitate glandular in shallow pits, adaxially moderately pilose, very sparsely minutely stipitate glandular, margin serrate to serrulate (teeth mucronate), pilose-ciliae, midvein slightly prominent abaxially, apex mucronate; lowest leaves present and dominant at anthesis, long petiolate (petiole to 7 cm); blade spatulate or obovate to oblanceolate, 1.5–9 × 0.8–3.8 cm, base attenuate, apex rounded to obtuse; lower to middle leaves sessile, pandurate, 4–5 × 0.9–1.7 cm, base auriculate, clasping, margin entire; upper leaves sessile, lanceolate to linear-lanceolate, 2.5–4 × 0.3–1 cm, base auriculate, clasping; synflorescence leaves few, linear-lanceolate, 0.8–2 × 0.1–0.5 cm, base ± auriculate, margin entire. Capitula 1–10 in terminal corymbiform synflorescences, sometimes solitary; peduncles 3.5–10 cm, pilose, striigillose, sparsely to moderately minutely stipitate glandular; bracts linear, entire, upper bracts closely subtending capitula and grading into phyllaries. Involucres hemispheric, 6–8 mm; phyllaries 3-seriate, unequal, green apically, glabrous, base ± hardened, margin broadly scarious, erose, purplish, ciliate, midvein more pronounced distally, ± translucent, apex acuminate, sometimes erose, purplish, ciliolate; outer phyllaries lanceolate, 3–4 × 0.6–1 cm, (outermost tip recurved, ciliate, minutely stipitate glandular); middle and inner phyllaries membranous, often multiveined; middle phyllaries oblongate, 5.5–6.5 × 1.2–1.3 mm; inner phyllaries lanceolate, 6.5–7 × ca. 1 cm. Ray florets 35–54, purple, tube hairy, lamina 9–10 × 1–1.5 mm, eglandular; disk florets yellow, 4.5–5.5 mm, tube base flared, tube apex and limb base striigillose, eglandular, limb campanulate, 2.8–3 mm, lobes spreading, narrowly triangular, 2.1–2.3 mm, glabrous, eglandular. Achenes oblong, slightly compressed, 2–2.5(–3) mm (immature), sparsely striigillose, minutely stipitate glandular, 2-ribbed. Pappus 3-seriate, ± reddish, of barbellate bristles; outermost series of white scales, 0.4–0.6 mm; inner bristles 4–4.6 mm, tapering; innermost bristles 5–5.2 mm, weakly clavate. Fl. May–Jun, fr. Jun–Aug.

- Shaded damp places, ravines, canal sides on slopes; 800–2400 m. C and W Sichuan.
Erigeron panduratus  C. C. Chang, Sunyatsenia 6: 17. 1941, not Aster panduratus Nees ex Walpers (1843).

Herbs, perennial, 30–40 cm tall, rhizomatous; stolons long, slender. Stems erect, simple, purplish striate, ± densely villous, very sparsely minutely stipitate glandular, more densely long-stipitate glandular under leaves. Leaves caulescent, gradually reduced upward, petiole base and midvein marcescent, abaxially purplish, sparsely villous, veins sparsely minutely stipitate glandular (long stipitate at base and on petiole), adaxially villous to pilose, minutely stipitate glandular apically, margin serrate, ciliate, midvein prominent abaxially, margin obtuse to acute, mucronate; lowest leaves withered by anthesis, lower to upper leaves narrowly to broadly winged petiolate (petiole to 1.3 cm, petiole base auriculate-clasping, proximal margin villous) or sessile, ovate or pandurate to lanceolate-pandurate, 2.5–3.5 × 0.7–2 cm, base attenuate or auriculate, clasping; synflorescence leaves shortly petiolate, ovate to lanceolate, 1–2.3 × 0.4–1 cm. Capitula 3–5 in terminal, corymbiform synflorescences; peduncles 10–42 mm, villous, densely minutely long-stipitate glandular; bracts ovate to lanceolate, entire. Involucres hemispheric, 7–8–(10) mm; phyllaries 4-seriate, unequal, abaxially glabrous, densely minutely stipitate glandular, base usually hardened, midvein prominent, translucent; outer phyllaries bractlike, linear-lanceolate, 5–5.5 × 1–1.2 mm, distal 1/2 leaflike, margin not or ± narrowly scarious, ciliate, densely minutely stipitate glandular, apex spreading, sometimes squarrose, acute, sometimes mucronulate, purplish, middle and inner phyllaries with margin erose, ciliate, apex long acuminate, tip leaflike, purplish; middle phyllaries oblanceolate, 6–8 × 1.3–1.5 mm, margin broadly scarious, ciliate; inner phyllaries linear-lanceolate, 8–8.5 × 1–1.2 mm, scarious. Ray florets 35–40, purplish to pink, tube sparsely hairy, lamina 7–9 × 1–1.2 mm, eglandular; disk florets yellow, ca. 4 mm, tube and limb base sparsely hairy, eglandular, limb campanulate, 2.2–2.5 mm, lobes erect to spreading, narrowly triangular, ca. 1 mm, glabrous, eglandular. Achenes (immature; shape unknown) ca. 2.7 mm or more, sparsely strigillose, minutely stipitate glandular, 2-ribbed. Pappus 3-seriate, reddish, of slender barbellate bristles; outermost bristles few, 1.3–1.6 mm; inner bristles 3.3–3.7 mm, tapering; innermost bristles 3.5–4 mm, long clavate. Fl. Jul–Aug (to later).


琴叶紫菀 qín yè zǐ wān

Aster argyi H. Léveillé; A. candelabrum Vaniot.

Herbs, perennial, 14–100 cm tall, sometimes caespitose, rhizomatous, sometimes with next year’s rosette. Stems erect, simple or branched upward, purplish striate, ± densely villous, ± densely minutely long-stipitate glandular. Leaves caulescent, gradually reduced upward, abaxially villous to shortly villous (upper leaves), adaxially villous to strigose (upper leaves), veins villous, densely minutely long-stipitate glandular, margin coarsely serrate to serrulate or entire (upper leaves), villous to strigose-ciliate, midvein prominent abaxially, sometimes somewhat 3-veined, apex obtuse to acute, mucronulate; lowest leaves withered by anthesis, (long) winged petiolate, ovate, base attenuate; lower to upper leaves sessile, ovate or pandurate to lanceolate-pandurate, 1.5–7(–9) × 0.4–1.8(–2.5) cm, base auriculate, clasping; synflorescence leaves oblong-ovate, 1–2.5 × 0.2–0.8 cm. Capitula 3–40, in terminal, laxly corymbiform synflorescences, rarely solitary; peduncles 5–50 mm, villous, densely minutely long-stipitate glandular; bracts lanceolate, entire, upper bracts grading into phyllaries. Involucres hemispheric to campanulate, ca. 5 mm; phyllaries 3-seriate, unequal, midvein thin; outer phyllaries linear-lanceolate, 3.3–5 × 0.5–0.7 mm, abaxially glabrous, densely minutely long-stipitate glandular, leaflike, margin not to ± narrowly scarious, ciliate, apex sometimes spreading, acute, sometimes mucronate, sometimes purplish, ciliate, middle and inner phyllaries green distally, base hardened, margin erose, ciliate; middle phyllaries oblong-lanceolate, 3.8–4 × 1–1.3 mm, abaxially densely minutely long-stipitate glandular, scarious. Ray florets 15–25, purple to blue, or white tinged purplish, tube sparsely strigillose, lamina 5–7 × 1.5–2 mm, eglandular; disk florets yellow, 4.5–5 mm, tube and limb base sparsely strigillose, minutely stipitate glandular, limb campanulate, 2.5–3 mm, lobes erect to spreading, narrowly triangular, 1.5–1.7 mm, glabrous, sparsely minutely stipitate glandular. Achenes obovoid, slightly compressed, ca. 1.5 mm, sparsely strigillose, minutely stipitate glandular, 2-ribbed. Pappus 3- or 4-seriate, of few, reddish, slender barbellate bristles; outermost bristles few, ca. 0.5 mm; outer bristles absent or 1, ca. 2 mm; inner bristles 2.5–3 mm, tapering; innermost bristles 4–5 mm, weakly clavate. Fl. Feb–Sep, fr. Jun–Oct.


毛脉紫菀 máo mài zǐ wān

Herbs, perennial, 30–50 cm tall; rhizomes thick. Stems erect, simple, densely villous, more sparsely so upward, densely minutely stipitate glandular. Leaves caulescent, somewhat reduced upward, base sometimes marcescent, abaxially villous, adaxially strigillose, both surfaces minutely stipitate glandular, thin, margin serrulate to serrate, villosulous-ciliate, 3-veined, lower secondary veins prominent, apex obtuse to acute, mucronulate; lowest leaves withered by anthesis, long winged petiolate, petiole base auriculate; blade oblong-lanceolate, base attenuate; lower to upper leaves shortly winged petiolate (base clasping) to sessile, oblong-lanceolate to oblong, 3–8 × 0.7–1.8 cm, base rounded; synflorescence leaves lanceolate, 2.3–5 × 0.5–0.9 cm, base cuneate-rounded, margin entire. Capitula 3 or 4 or more (simple specimen) in terminal corymbiform synflorescences, rarely solitary, ca. 3 cm in diam.; peduncles 25–90 mm, strigillose to villosulous, densely minutely stipitate glandular; bracts lanceolate to linear-lanceolate, entire. Involucres broadly campanulate, 5–6(–7) × ca. 10 mm; phyllaries 3-seriate, nearly subequal, abaxially strigillose to villosulous, sparsely to densely minutely stipitate glandular, base hardened, midvein slightly

- Thickets, grasslands on slopes, canal sides, roadsides, field margins; 100–1400 m. Fujian, Guangdong, Guangxi, Guizhou, W Hubei, Hunan, Jiangsu, Jiangxi, W Sichuan, Zhejiang.

- Mountain forests; ca. 2700 m. W Guangxi.

Herbs, perennial, 30–40 cm tall, rhizomatous; stolons long, slender. Stems erect, simple, purplish striate, ± densely villous, very sparsely minutely stipitate glandular, more densely long-stipitate glandular under leaves. Leaves caulescent, gradually reduced upward, petiole base and midvein marcescent, abaxially purplish, sparsely villous, veins sparsely minutely stipitate glandular (long stipitate at base and on petiole), adaxially villous to pilose, minutely stipitate glandular apically, margin serrate, ciliate, midvein prominent abaxially, apex obtuse to acute, mucronulate; lowest leaves withered by anthesis, lower to upper leaves sessile, ovate or pandurate to lanceolate-pandurate, 1.5–7(–9) × 0.4–1.8 cm, base auriculate, clasping; synflorescence leaves oblong-ovate, 1–2.5 × 0.2–0.8 cm. Capitula 3–40, in terminal, laxly corymbiform synflorescences, rarely solitary; peduncles 5–50 mm, villosulous, densely minutely long-stipitate glandular; bracts lanceolate, entire, upper bracts grading into phyllaries. Involucres hemispheric to campanulate, ca. 5 mm; phyllaries 3-seriate, unequal, midvein thin; outer phyllaries linear-lanceolate, 3.3–5 × 0.5–0.7 mm, abaxially glabrous, densely minutely long-stipitate glandular, leaflike, margin not to ± narrowly scarious, ciliate, apex sometimes spreading, acute, sometimes mucronate, sometimes purplish, ciliate, middle and inner phyllaries green distally, base hardened, margin erose, ciliate; middle phyllaries oblong-lanceolate, 3.8–4 × 1–1.3 mm, abaxially densely minutely long-stipitate glandular, scarious. Ray florets 15–25, purple to blue, or white tinged purplish, tube sparsely strigillose, lamina 5–7 × 1.5–2 mm, eglandular; disk florets yellow, 4.5–5 mm, tube and limb base sparsely strigillose, minutely stipitate glandular, limb campanulate, 2.5–3 mm, lobes erect to spreading, narrowly triangular, 1.5–1.7 mm, glabrous, sparsely minutely stipitate glandular. Achenes obovoid, slightly compressed, ca. 1.5 mm, sparsely strigillose, minutely stipitate glandular, 2-ribbed. Pappus 3- or 4-seriate, of few, reddish, slender barbellate bristles; outermost bristles few, ca. 0.5 mm; outer bristles absent or 1, ca. 2 mm; inner bristles 2.5–3 mm, tapering; innermost bristles 4–5 mm, weakly clavate. Fl. Feb–Sep, fr. Jun–Oct.
translucent, distal margin and apex ± purplish; outer phyllaries linear-oblong, 4–4.6 × 0.6–0.7 mm, distal 1/2 leaflike, margin barely to ± scarious, ciliate, glandular, apex sometimes spreading or squarrose, acute, mucronulate, ciliate; middle phyllaries linear-oblong to linear-lanceolate, 5–6 × 1–1.2 mm, margin narrowly scarious, tip green or sometimes leaflike, apex acute to acuminate; inner phyllaries linear-lanceolate, 5–5.5 × ca. 1 mm, margin broadly scarious, erose, tip green, apex erose. Ray florets 23–27, blue, tube sparsely strigillose, lamina 7–9 × 1.6–2 mm, eglandular; disk florets yellow, ca. 4.5 mm, limb campanulate, ca. 3 mm, proximally sparsely strigillose and minutely stipitate glandular, lobes erect, tip sometimes spreading, narrowly triangular, ca. 1 mm, tip sparsely strigillose and minutely stipitate glandular. Achenes narrowly obovoid, ± compressed, 2.5–2.8 mm, densely strigillose, sparsely strigillose on ribs, minutely stipitate glandular apically, 2-ribbed. Pappus 3- or 4-seriate, straw-colored, of slender barbellate bristles; outermost bristles few, slender, 0.3–0.6 mm; inner bristles ca. 5.6 mm; innermost bristles ca. 7.2 mm, barely tapering; innermost bristles 4.2–4.3 mm, barely clavate. Fl. and fr. Sep.

- Ravines, mountain canals; ca. 2700 m. NW Yunnan (Dêqên).

*Aster trichoneurus* is similar to *A. auriculatus* but differs in its broader and larger, 3-veined leaves without clasping auricles, and narrow, sparsely hairy phyllaries.


莽山紫菀 mang shan zi wan

Herbs, perennial, 17–30 cm tall; rhizomes ± robust. Stems erect, ± densely yellowish strigose, more so upward, stipitate glandular on peduncles. Leaves moderately to densely strigose, ± with dense sessile glands, adaxially densely strigose, abaxially midvein slightly prominent, lateral veins 3- or 4-paired, obscure; lower leaves withered by anthesis; middle leaves sessile or shortly petiolate (petiole less than ca. 2 mm); blade oblong to obovate-oblong, 2.2–2.5 × 0.3–1.1 cm, base cuneate to rounded, margin entire, revolute, scabrous-ciliate, apex obtuse to rounded; upper leaves gradually reduced, 0.8–1 × 0.4–0.6 cm. Capitula in paniculate-corymbose synflorescence, ca. 1.5 cm in diam.; peduncles 1–3 cm; bracts obovate-oblong. Involucres hemispheric (broadly obconic), 4–5 × ca. 7 mm; phyllaries 3-seriate, subequal, obovate-oblong, abaxially strigose, with sessile glands, margin strigose- to ± villous-ciliate; outer phyllaries reflexed, ca. 4 × 1–1.5 mm, leaflike or distally leaflike, apex obtuse to acute; inner phyllaries 4–4.5 × ca. 1 mm, acute, margin scarious, erose, ciliate. Ray florets 14–16, white, tube 1–1.3 mm, lamina 6–7 × 1.5–1.8 mm; disc florets 4–4.2 mm, tube 1.1–1.5 mm, upper tube and limb hairy, limb campanulate, lobes lanceolate, ca. 0.7 mm, recurved, glandular. Achenes greenish, obovate-oblong, slightly compressed, slightly trigonous, 1.9–2.3 mm, sparsely strigillose, with sparse sessile glands, pale 3-ribbed. Pappus 3-seriate, orangish; outer bristles ca. 0.4 mm; inner bristles ca. 5.6 mm; innermost bristles ca. 7.2 mm, barely clavate.

- S Hunan (Yizhang; Mang Shan).


灰枝紫菀 hui zhi zi wan

Herbs, perennial, 50–130 cm tall, rarely caespitose, rhusmatous. Stems erect-ascending, simple, reddish striate, villosulous, minutely long-stipitate glandular below leaves. Leaves cauleine, gradually reduced upward, abaxially gray-green, adaxially green, abaxially tomentose, sometimes sparsely villous, densely minutely stipitate glandular, adaxially strigose, sparsely minutely stipitate glandular, margin serratule to serrulate, stigose-ciliate, midvein prominent abaxially, apex acute, mucronulate; lowest leaves withered by anthesis (unobserved); lower to upper leaves broadly and shortly petiolate (lower leaves) to sessile, ovate to elliptic or obovate, 1.8–6 × 0.5–1.7 cm, base rounded or slightly auriculate to cuneate-rounded, sometimes subclasping; synflorescence leaf blade ovate to lanceolate, 1.3–2.5 × 0.4–0.7 cm, entire. Capitula 6–35 or more, in terminal corymbose synflorescences; peduncles 10–35 mm, sparsely villosulous, densely minutely stipitate glandular (glands sometimes long stigitate); bracts absent or 1, oblongate, entire. Involucres broadly campanulate to hemispheric, 4–6 mm; phyllaries 3-seriate, unequal, distally green, distal margin and apex tip purple, abaxially glabrous, densely minutely stipitate glandular, base hardened, densely minutely stipitate glandular, midvein prominent, translucent; outer phyllaries linear-lanceolate, 3–4 × ca. 0.8 mm, margin narrowly scarious, eciliate, apex acute, mucronulate, proximally strigillose, sparsely long-stipitate glandular; middle and inner phyllaries oblong to lanceolate-oblong, 4.5–5.5 × 1.2–1.8 mm, margin broadly scarious, erose, eciliate, apex acuminate, erose. Ray florets 18–30, white or pale purple, lamina 5–9 × 1.5–2 mm, glabrous, eglandular; disk florets yellow, ca. 4.5 mm, limb campanulate, ca. 2.5 mm, base sparsely strigillose, sometimes sparsely minutely stipitate glandular, lobes erect to spreading, narrowly triangular, ca. 1.2 mm, glabrous, sparsely minutely stipitate glandular. Achenes obovoid, compressed, 2.5–3 mm, strigillose, sparsely minutely stipitate glandular, 2-ribbed. Pappus 3-seriate, reddish, of barbellate bristles; outermost bristles few, slender, 0.3–0.6 mm; inner bristles 3–3.5 mm, tapering; innermost bristles 4.2–4.7 mm, slightly clavate. Fl. and fr. Sep.–Dec.

Alpine and subalpine forest margins, grasses, slopes, riverbanks, sandy places; 2200–3200 m. SW Sichuan, S Xizang, N and NW Yunnan [Bhutan, India (Sikkim), N Myanmar].


灰枝紫菀 hui zhi zi wan

Subshrubs, 15–100 cm tall, sometimes shrublike, caespitose, cœduit woody. Stems branched, bark gray-brown, lacerate; branches erect, densely leafy, sparsely to densely villosulous, often in decurrent lines below leaves, minutely stipitate glandular. Leaves cauleine, slightly reduced upward; lower leaves withered by anthesis, shortly petiolate; blade obovate or linear-oblong, sometimes conduplicate and arched, 0.5–2–(3) × 0.1–0.5–(0.8) cm, abaxially densely strigillose, minutely gland-dotted, sometimes stipitate glandular on veins, adaxially strigose, base decurrent, attenuate to cuneate, margin entire, stigose-ciliate, midvein abaxially prominent, apex obtuse to acute,
mucronate. Capitula in corymbiform, sometimes paniculate-corymbiform, synflorescences, or solitary; peduncles 10–30 mm, strigillose, minutely short- to long-stipitate glandular; bracts remote, lanceolate to oblanceolate, 5–10 mm. Involucres hemispheric, 6–7 × ca. 1 mm, scarious, tip purplish, sparsely minutely stipitate glandular. Ray florets 10–20, lavender or lilac to purple, tube distal 1/2 and lamina base strigillose, sometimes sparsely stipitate glandular, lamina 7–10 × 1.2–2 mm; disk florets yellow, 5–6.5 mm, limb funnelform, ca. 4 mm, lobes spreading, narrowly triangular, 0.7–1.2 mm, tip glabrous, sparsely stipitate glandular. Achenes obvoid to elliptic, compressed, 3–3.5 mm, sparsely strigillose, minutely stipitate glandular, mostly on ribs, 2–3-ribbed. Pappus 4-seriate, straw-colored, of slender, barbellate bristles; outermost bristles few, very slender, 0.1–0.5 mm; outer bristles few; very slender, 2.5–3 mm; inner bristles 4.2–4.5 mm, tapering; innermost bristles 4.5–5 mm, tip flattened. Fl. Jun–Sep, fr. Aug–Oct.

- Dry slopes, rocky cliffs, stony places, Artemisia-Stipa formations, xerophytic shrublands, riverbanks, roadsides; 800–4200 m. S Gansu, E Qinghai, Shaanxi, W Sichuan, E Xizang.


西周紫菀 xi gu zi wan

Subshrubs, 30–40 cm, caespitose. Stems numerous, erect or ascending, puberulent, branched above, densely leafy. Leaves cauliine, thick, densely puberulent, abaxially gray-green, mid-vein and 3- or 4-pairs of lateral veins prominent, adaxially dark green; lower leaves withered by anthesis; middle leaves subsulate, oblong, elliptic, or oblong-lanceolate, 1.5–2.5 × 0.5–0.8 cm, base ± rounded or broadly cuneate, margin entire, revolute, apex obtuse or rounded; upper leaves gradually reduced, 0.4–0.6 × 0.2–0.3 cm. Capitula ca. 1.5 cm in diam., solitary or in corymbiform synflorescences; peduncles to 3 cm. Involucres hemispheric, 1.5–5 × 6–7 mm; phyllaries 4-serial, unequal, abaxially puberulent, membranous, margin villous-ciliate; outer phyllaries ovate-lanceolate, 1.5–2 × ca. 0.8 mm, acute, sometimes somewhat purplish; inner phyllaries lanceolate, ca. 3 × 1 mm, acute; innermost phyllaries linear-lanceolate, 4.5–5 × ca. 0.8 mm, margin narrowly scarious, acuminate. Ray florets 10–16, white or reddish, tube 2–2.4 mm, hairy, lamina linear-oblong, 8–10 × 1.3–1.5 mm; disk florets 4.8–5.2 mm, tube 1.8–2.1 mm, tube and limb sparsely hairy, lobes lanceolate, ca. 1.2 mm, tip glandular. Achenes lanceolate, slightly compressed, ca. 2 mm, strigose, 4-ribbed. Pappus 3-seriate, yellowish to reddish; outer bristles ca. 0.2 mm; inner bristles ca. 3 mm, acute; innermost bristles 4–4.5 mm, clavate. Fl. Oct.

- Dry slopes or stony places, dry roadsides; 800–2300 m. S Gansu (Xigu), NW Sichuan.


凉山紫菀 liang shan zi wan

Herbs, perennial, 50–80 cm; rhizome vertical or procumbent. Stems erect or ascending, thick, multibranched, finely sulcate, strigose and strigillose. Leaves cauliine, abaxially strigose, veins with sparse sessile glands and sparsely villous-stribose; midvein and 5 or 6 pairs of lateral veins prominent, conspicuously reticulate, adaxially densely strigose; lower leaves withered by anthesis; middle leaves sessile or shortly petiolate; blade ovate to broadly lanceolate, 6–11 × 1.5–2.5 cm, base gradually or abruptly attenuate, rarely subrounded, subclasping, margin serrate, teeth mucronulate, scabrous, apex acute to acuminate; upper leaves lanceolate, 3–5 × 0.5–1 cm, margin entire or serrulate. Capitula in terminal, open corymbiform synflorescences, 3–4 cm in diam.; peduncles 2–10 cm; bract linear-lanceolate when present. Involucre hemispheric, 10–12 mm in diam.; phyllaries 3-seriate, subequal, 5–6 × 1.5–1.8 mm, abaxially villous-strigillose, margin scarious (outer phyllaries narrowly so), erose-fimbriate, purplish; outer phyllaries oblong to oblanceolate, leaflike, base hardened, apex acute to acuminate, sometimes recurved, glandular; inner phyllaries membranous, apex herbaceous. Ray florets 50–60, blue-purple, tube 0.7–1 mm, glabrous, lamina 8–15 × 1.5–2 mm; disk florets yellow, 3–4 mm, glabrous, tube ca. 1.1 mm, limb campanulate, lobes 1–1.1 mm. Achene brown, obvoid, compressed, 2.5–2.8 mm, sparsely strigillose to glabrate, pale 2–4-ribbed. Pappus 3-seriate, dirty white or reddish brown, of barbellate bristles; outermost bristles slender, 0.4–0.9 mm; inner bristles ca. 3.8 mm, acute; innermost bristles 4–4.1 mm, slightly clavate. Fl. Jun–Aug, fr. Aug–Sep.

- Low mountains and alpine forests, grasslands, dry stony shrubby slopes, roadsides; 2500–3100 m. SW and W Sichuan.

The involucre and the number of ray florets of Aster taliangshansen are distinctive.


高茎紫菀 gao jing zi wan

Asteromoea proceras (Hemsley) Y. Ling, Kalimeris proceras (Hemsley) S. Y. Hu.

Herbs, perennial, 70–100 cm tall. Stems erect, thick, strigose or ± glabrescent in lower part, stipitate glandular below capitula, spreading branched from middle. Leaves abaxially pale green, both surfaces scabrous, thin, midvein abaxially prominent; (lower leaves not seen); middle leaves shortly petiolate; blade ovate to ovate-lanceolate, 7–11 × 3.5–5.5 cm, base attenuate, margin serrate, apex acute to acuminate; upper leaves sessile, small, finely serrate or subentire. Capitula solitary at ends of branches or long peduncles, in open corymbiform synflorescences, 3–4 cm in diam.; peduncles 3–4 cm; bracts densely scabrous, glandular. Involucres hemispheric, 6–7 mm, 12–15 mm in diam.; phyllaries 2- or 3-seriate; outer phyllaries leaflike, subequal, shorter to slightly longer than inner phyllaries, ca. 5.1 × 1–1.5 mm, densely scabrous, margin sca-
brous, apex acuminat; most inner phyllaries membranous, narrower, sparsely scabrous or glabrate, margin narrowly scarious. Ray florets 10–20, white, tube 0.7–1 mm, hairy (not seen), lamina oblong-linear, ca. 15 × 2–2.5 mm; disk florets ca. 3.7 mm, tube 1.1–1.5 mm, hairy, limb campanulate, lobes lanceolate, 1–1.2 mm, recurved. Achenes brown, obovoid, slightly compressed, trigonous, 3.5–4 mm, strigose, 3-ribbed. Pappus 1-seriate, dirty white, of unequal, rigid bristles 1.1–1.5 mm. Fl. May–Sep, fr. Aug–Oct.

- Forest margins, mountain slopes; below 400 m. S Anhui, W Hubei, N Zhejiang.


甘川紫菀 甘州紫菀


Subshrubs or herbs (woody), perennial, 60–150 cm tall, rhizomatous. Stems erect, simple or branched, shortly striate, villous, minutely stipitate glandular, resinous. Leaves cauline, gradually reduced upward, abaxially silvery green, adaxially green, abaxially villous-strigillose, veins villosulous, sparsely to moderately minutely stipitate glandular, adaxially scabridulous, resinous, base attenuate, margin entire, sometimes shortly serrate, strigillose-ciliate, midvein prominent on both surfaces, apex acute; lowest leaves withered by anthesis, shortly and narrowly winged petiole (blade not observed); lower to upper leaves lanceolate, 4.75–(10) × 1.2–2.3 cm; synflorescence leaves lanceolate, sometimes falcate, 1.2–6 × 0.3–1.8 cm, mucronulate. Capitula 7 to numerous in terminal corymbiform synflorescences; peduncles 18–70 mm, sparsely to moderately strigillose-villosulous, sparsely to moderately stipitate glandular, resinous, more densely so below capitula; bracts oblongate, entire, grading into phyllaries. Involucres hemispheric, 2–3 mm; phyllaries 3-seriate, unequal to subequal, abaxially sparsely to densely villosulous, more densely villosulous distally, densely minutely stipitate glandular, resinous, base hardened, slightly keeled, membranous, margin narrowly scarious, erose, ciliate, green distally, midvein prominent, translucent, sometimes faintly multiveined, inner surface shiny, apex acute to obtuse, sometimes mucronulate; outer phyllaries lanceolate, 2.4 × 0.8–1.5 mm; middle phyllaries oblongate, 4–4.5 × 1–1.3 mm; inner phyllaries obovate, 4–4.5 × ca. 1 mm, tip sometimes purplish. Ray florets 21–25, white or light purple, tube apex and lamina base sparsely hairy, sometimes sparsely minutely stipitate glandular, lamina 6–10 × 1.5–2 mm; disk florets yellow, ca. 3 mm, tube apex and limb base sparsely hairy, sparsely minutely stipitate glandular, limb campanulate, 2–2.5 mm, lobes spreading, narrowly triangular, ca. 0.7 mm, glabrous, eglandular. Achenes dark purple, broadly obovoid, ± compressed to ± trigonous, 2.5–3 mm, sparsely strigillose, sparsely minutely stipitate glandular distally or eglandular, 2–3-ribbed. Pappus 4-seriate, dirty white, of few barbellate bristles; outermost series of narrow scales 0.2–0.4 mm; outer bristles slender, 0.8–1.5 mm; inner bristles ca. 2.5 mm, tapering; innermost bristles ca. 3 mm, clavate. Fl. and fr. Jul–Sep.

- Grasslands on slopes, *Quercus-Abies* scrub on dry slopes, scrub, thicket margins, dry stream banks, canal sides, roadsides; 2400–3500 m. Gansu, S Shaanxi, NW and W Sichuan.


长梗紫菀 chang geng zi wan

Herbs, perennial, 38–90 cm tall, sometimes caespitose; rhizomes long, thin. Stems erect, simple, sometimes branched upward, reddish stiillou, villous, sparsely minutely stipitate glandular. Leaves caulinne, gradually reduced upward; blade abaxially pale green, adaxially green, abaxially sparsely strigose, eglandular, adaxially scabridulous, base rounded (lower leaves) or auriculate, clasping, margin remotely serrate to entire, strigose-ciliate, midvein prominent on both surfaces, apex acuminate, often falcate, mucronulate; lowest leaves withered by anthesis (unobserved); lower to upper leaves shortly petiolate (lower leaves) or sessile, lanceolate to linear-lanceolate, 3.5–13 × 0.3–1.8 cm; synflorescence leaves lanceolate to linear-lanceolate, 1.5–5 × 0.1–1 cm. Capitula 1–16 in terminal corymbiform synflorescences, sometimes solitary; peduncles 25–150 mm, sparsely villosulous, sparsely stipitate glandular, more densely so below capitula; bracts linear-lanceolate, entire, sometimes falcate, sometimes subending involucrce. Involucres broadly campanulate, 5–6 mm; phyllaries 3- or 4-seriate, unequal, green distally, abaxially glabrous, densely minutely stipitate glandular, base hardened, membranous, margin narrowly scarious, erose, ± purplish distally, glandular, midvein prominent, translucent, sometimes faintly multiveined, apex sometimes curved, acute, sometimes mucronulate, purpurish; outer phyllaries oblong-lanceolate, 2.5–3 × 0.6–0.8 mm; middle phyllaries narrowly obovate, 4.5 × 1–1.2 mm; inner phyllaries narrowly obovate, 5.5 × 0.8–1.1 mm, scarious. Ray florets 19–26, light purple to purple, tube apex and lamina base sparsely hairy, sometimes sparsely minutely stipitate glandular, lamina 10–14 × 1.5–2 mm; disk florets yellow, sometimes becoming purplish, 4–4.5 mm, tube apex and limb base sparsely strigillose, sparsely minutely stipitate glandular, limb campanulate, 2.2–2.5 mm, lobes spreading, narrowly triangular, 1–1.2 mm, tip very sparsely strigillose, sparsely minutely stipitate glandular. Achenes dark purple, broadly obovoid, ± compressed to ± trigonous, 2.5–3 mm, sparsely strigillose, sparsely minutely stipitate glandular distally or eglandular, 2–3-ribbed. Pappus 4-seriate, dirty white, of few barbellate bristles; outermost series of narrow scales 0.2–0.4 mm; outer bristles slender, 0.8–1.5 mm; inner bristles ca. 2.5 mm, tapering; innermost bristles ca. 3 mm, clavate. Fl. and fr. Jul–Sep.

- Low mountains, subalpine grasslands, stony riverbanks; 1300–3400 m. S Gansu, W Sichuan, NW Yunnan.


台岩紫菀 tai yan zi wan

Herbs, perennial, 30–80 cm tall (specimens incomplete); rhizomes long, slender. Stems erect, simple, flexuous, sometimes branched in upper part, finely striate, purplish, glabrous, eglandular. Leaves caulinne, gradually reduced upward, long
petiolate (petiole to 7 cm); petiole purple, base hyaline-aureolate, clasping; blade abaxially pale green, adaxially green, shiny, abaxially glabrous, minutely stipitate glandular in pits, adaxially scabridulous near margin, base cordate, margin coarsely serrate, sparsely ciliate, midvein and main lateral veins prominent abaxially, apex long acuminata, mucronata; lowest leaves (not seen) withered by anthesis, sometimes marcescent, blade oblong; lower to upper leaves ovate, 6–11(–16) × 2.5–7 cm; synflorescence leaves petiolate (petiole to 1 cm), lanceolate, 2–4 × 0.2–0.8 cm, base cuneate, margin serrulate or entire. Capsula to 130 or more, in terminal paniculiform-corymbiform synflorescences; peduncles 7–10 mm, sparsely to moderately siliquose, minutely stipitate glandular; bracts lanceolate, entire. Involucres cylindric-campanulate, 3–5 mm; phyllaries 3–4-seriate, unequal, green, ca. 1 mm wide, glabrous, minutely stipitate glandular, resinous, margin narrowly to broadly scarious, erose, midvein pronounced, ± translucent, apex rounded to obtuse or acute, erose, purplish, ciliate; outer phyllaries ovate, 1.5–2 mm; middle phyllaries oblong, 2–3 mm, base hardened; inner phyllaries oblong, 4–5 mm. Ray florets 8–15, tube siliquose, lamina white, 4.5–6.5 × 1–1.5 mm, eglandular; disk florets yellow, ca. 7 mm, tube base flared, tube apex and limb base siliquose, limb campanulate, ca. 3.5 mm, lobes spreading, recurved, narrowly triangular, ca. 3 mm, eglandular. Achenes (immature) oblong, slightly compressed, 2.5–3 mm, 4-ribbed, siliquose, eglandular. Pappus (immature) 3-seriate, straw-colored, of barbellate bristles; outer bristles few, slender, ca. 2 mm; inner bristles 3.5–4 mm, tapering; innermost bristles ca. 4.5 mm, weakly clavate. Fl. and fr. May–Dec.

- Roadsideways, exposed and damp places in mixed broad-leaved and coniferous forests; 1400–2700 m. Taiwan, Zhejiang.


长叶紫菀 chang ye zi wan

Herbs, perennial, up to ca. 45 cm tall; rhizomes strong, branched. Stems ascending, densely leafy in lower part, more sparsely leafy in upper part, glabrous or strigose in upper part. Leaves ± thick, glabrous, eglandular, abaxially with 3 or 4 pairs of lateral veins joining to form a raised submarginal vein on each side, reticulate veins ± conspicuous; basal and lower leaves present at anthesis, long petioloite; petiole subclasping; blade oblong-lanceolate, 10–17 × 1–2 cm, base gradually attenuate, margin distally sparsely crenate-serrulate, teeth mucronulate, apex falcate-acuminate or acuminatae; middle leaves shortly petioloate, narrowly lanceolate, 5–9 × 0.5–0.8 cm, base attenuate, margin entire, rarely crenate-serrulate; upper leaves sessile, reduced, linear-lanceolate. Capsula ca. 8 in open corymbiform synflorescences, ca. 2.5 cm in diam.; peduncles densely strigose; bracts linear. involucres hemispheric, 6–7 × 6–7 mm; phyllaries 3-seriate, lanceolate, apex long acuminate; outer phyllaries ca. 2.5 mm, sparsely strigose, apex leaflike; inner phyllaries membranous, margin scarious, ciliate. Ray florets ca. 10, white, tube ca. 2 mm, densely hairy, lamina linear, up to 10 × 1 mm; disk florets 5–6 mm, tube 1.7–2.5 mm, densely hairy, limb funnelform, lobes lanceolate, ca. 1.7 mm, glabrous. Achenes brown, narrowly oblong-lanceolate, slightly compressed, ca. 4.8 mm, densely strigose, pale 4-ribbed. Pappus reddish, 4-seriate; outermost series ca. 0.6 mm; outer series slender, ca. 2.8 mm; inner series ca. 5 mm, acute; innermost series ca. 5.7 mm, clavate. Fl. Oct.

- With mosses on rocks along riverbanks in forests. N Guangxi (Longsheng).


川鄂紫菀 chuan e zi wan


Herbs, perennial, 12–40 cm tall, ± caespitose; rhizomes robust, ± woody. Stems erect, slender, branched in upper part, canaliculate, glabrous or sparsely siliquose in lower part, siliquose in upper part. Leaves glabrous, eglandular, thick, margin slightly revolute or flat, thickened, remotely, sparsely siliquose or serrate, teeth mucronulate; sebaceous, midvein conspicuously raised, lateral veins 2–3-paired, subparallel to margin and inconspicuous; basal leaves present at anthesis, ± rosulate, long petioloate, narrowly oblong to linear-oblong, 4.12 × 0.2–0.7 cm, gradually attenuate, apex acute or acuminate, mucronate; lower and middle leaves linear-oblong to linear, 2–4 × 0.2–0.4 cm, ± erect; upper leaves small, linear, abaxially sparsely siliquose, 1-veined. Capsula in open corymbiform synflorescences, 3–4 cm in diam. Involucres hemispheric, 7–8 × 10–12 mm; phyllaries 3-seriate, narrowly oblong, acute, apex tinged purple, siliquose; outer phyllaries narrower, green, membranous, ca. 7 × 1.5 mm, margin ciliate, of inner phyllaries scarious, erose-fimbriate. Ray florets 16–20, white, tube ca. 3 mm, hairy, lamina narrowly elliptic, ca. 15 × 1.5 mm; disk florets yellow, ca. 6 mm, tube ca. 2.5 mm, tube and limb hairy, limb funnelform, lobes ca. 1.5 mm, glabrous. Achenes tan to brown, oblong, compressed, ca. 3 mm, strigose, 2-ribbed. Pappus 3-seriate, yellowish; outer series ca. 0.3 mm; inner series ca. 4 mm, acute; innermost series ca. 5.5 mm, clavate. Fl. and fr. Jul–Sep.

- Riverbanks, grassy slopes, sandy areas, on rocks; 100–200 m. W Hubei, E Sichuan.


台灣紫菀 tai wan zi wan

*Aster baccharoides* (Bentham) Steetz var. *kanchira* Yamamoto; *A. scaberrimus* Hayata; *A. trinervius* Roxburgh ex D. Don var. *hayatae* Yamamoto; *A. trinervius* var. *scandens* Hayata.

Herbs, perennial, 30–100(–300) cm tall; rhizomes long, slender. Stems erect, simple, sometimes branched in upper part, finely striate, glabrous or glabrate or sparsely siliquose proximally, siliquose distally, minutely stipitate glandular below leaves. Leaves cauleine, gradually reduced upward, abaxially pale green, adaxially green, shiny, abaxially glabrous, minutely stipitate glandular in pits, veins sparsely siliquose, adaxially scabridulous, margin sparsely ciliate, midvein prominent abaxially, apex acuminata, mucronatae; lowest leaves withered by anthesis, shortly winged petioloate; blade obovate to oblanceo-
late, 0.7–9 cm, base attenuate, margin serrulate to coarsely serrate; lower to upper leaves shortly petiolate (petiole 0.2–0.5 cm); blade oblanceolate to narrowly lanceolate, 3–14 × 0.5–3 cm, base cuneate-rounded to rounded, margin serrate; synflorescence leaves shortly petiolate, lanceolate, 1.5–6 × 0.3–1.2 cm, base rounded, margin 1–5-serrate. Capitula 17–150 or more in terminal paniculate-corymbiform synflorescences; peduncles 3–10 mm, strigillose; bracts lanceolate, entire. Involucres cylindric-campanulate, 4.5–7 mm; phyllaries 5–7-seriate, unequal, green distally, ca. 1 mm wide, apically minutely stipitate glandular, margin scarious, erose, purplish, ciliate, midvein more pronounced distally; + translucent, apex rounded, erose, purplish, ciliate; outer phyllaries broadly ovate, ca. 1 mm; middle phyllaries oblong, 2–3 mm, base hardened; inner phyllaries oblong, 4–5 mm. Ray florets 8–17, white, tube apex sparsely hairy, lamina 7–10 mm, tube base flared, tube apex and limb base hairy and minutely stipitate glandular, limb campanulate, ca. 2 mm, lobes spreading, narrowly triangular, ca. 1 mm, abaxially sparsely minutely stipitate glandular. Achenes oblong, slightly compressed, ca. 2 mm, sparsely stipitate, minutely stipitate glandular, 3-ribbed. Pappus brownish, 4-seriate, dirty white or (innermost) ± reddish; outermost bristles few, 0.5–0.7 mm; outer bristles slender, very few or none, ca. 1.2 mm; inner bristles 2.8–3.2 mm, tapering; innermost bristles 3.5–4 mm, weakly clavate. Fl. and fr. Aug–Nov.


Herbs, perennial, 30–70 cm tall; rhizomes long, slender. Stems ascending, simple, branched distally, finely striate, moderately to densely villous proximally, strigillose distally, sparsely minutely stipitate glandular. Leaves cauliinal, not or slightly reduced upward; lowest leaves withered by anthesis, abaxially pale green (spongelike), adaxially green, shiny, abaxially stribose, minutely stipitate glandular in pits, adaxially scabridulous, margin slightly revolute, coarsely 3- or 4-seriate distally, teeth pointing forward, villous-ciliate, ± 3-veined, veins prominent abaxially, apex acuminate, mucronate; lowest leaves shortly winged petiolate; blade ovate to oblanceolate, ca. 2.5 cm (insufficient material), base attenuate, margin serrate; lower to upper leaves shortly petiolate (petiole to 0.3 cm); blade oblanceolate (proximally) to usually lanceolate, 5.2–6.5 × 1.5–2(–2.5) cm, base rounded; synflorescence leaves shortly petiolate, lanceolate, 2.2–4 × 0.8–1.3 cm, base rounded, margin 1–3-serrate or entire. Capitula 7–9 in terminal, loose corymbiform synflorescences; peduncles 1–4 mm, densely strigillose, minutely stipitate glandular in pits; bracts narrowly lanceolate to oblanceolate or linear-oblanceolate, scarios, erose. Involucres broadly campanulate to hemispheric, (3–)5 mm; phyllaries 3- or 4-seriate, unequal, green distally, apically strigillose and minutely stipitate glandular, sometimes slightly pitted, margin scarious, erose, purplish, ciliate, midvein more pronounced distally; ± translucent, apex acuminate, erose, purplish, ciliate; outer phyllaries narrowly ovate to oblong-lanceolate, 0.7–1.5 × ca. 0.5 mm; middle phyllaries oblong, 3–4 × ca. 0.9 mm, base hardened; inner phyllaries linear-oblong, 4–5 × 0.4–0.5 mm. Ray florets 8–15, white, tube apex sparsely hairy, lamina 7–10 × 1.5–1.8 mm, eglandular; disk florets yellowish green, 3.5–4 mm, tube base flared, tube apex and limb base strigillose and minutely stipitate glandular, limb campanulate, ca. 2.5 mm, lobes spreading, narrowly triangular, 1.5–1.7 mm, abaxially minutely stipitate glandular. Achenes black to mottled purple, obovate, slightly compressed, 2–2.5 mm, strigillose, minutely stipitate glandular, 2-ribbed (straw-colored). Pappus 4-seriate, with dirty white barbellate bristles; outermost bristles few, slender, 0.3–0.7 mm; outer bristles very few, slender, ca. 2 mm; inner bristles 2.5–3 mm, tapering; innermost bristles 3.2–3.3 mm, apically flattened. Fl. Jun–Aug.

Grassy slopes, deciduous or mixed evergreen forests on steep slopes, roadsides or trailsides in forests, rock walls, cliffs, often on limestone, exposed open sites; 100–3000 m. Taiwan.

等苞紫苑  deng bao zi wan

*Aster ageratoides* Turezaniow var. *grossedentatus* (Thunberg ex Diels) Kitamura; *A. trinervius* Roxburgh ex D. Don var. *grossedentatus* Thunberg ex Diels (Sep 1912); *A. trinervius var. grossedentatus* Franchet ex Diels (Oct 1912).

Herbs, perennial, 20–50 cm tall, sometimes caespitose; rhizomes long, slender. Stems erect, simple, finely striate, sparsely to moderately strigillose proximally, minutely stipitate glandular below leaves. Leaves cauline, gradually reduced upward, abaxially pale green, adaxially green, abaxially glabrous, veins strigillose to scabridulous, adaxially densely scabridulous, both surfaces sparsely minutely stipitate glandular in pits, more so apically, margin mucronate, midvein prominent abaxially, apex acuminate, mucronate; lowest leaves withered by anthesis, narrowly winged petiolate (petiolo 0.5–10 cm); blade ovate, 1–2.5 cm, base attenuate, margin coarsely serrate; lower to upper leaves narrowly to very broadly petiolate; blade ovate to lanceolate, 5–10 × 1.5–4 cm, base cuneate-rounded to rounded, sometimes auriculate, sometimes clasping, margin coarsely serrate; synflorescence leaves sessile, lanceolate, 2–7 × 0.5–2 cm, base cuneate to rounded, margin 1–5-serrate. Capitula 1–10 in terminal corymbiform synflorescences; peduncles 10–90 mm, strigillose; bracts lanceolate, entire. involucres campanulate, 5–8 mm; phyllaries 2- or 3-seriate, subequal, often squarrose, ob-lanceolate, abaxially sparsely to moderately villous-strigillose, sparsely minutely stipitate glandular, leaflike and green distally, margin erose, sparsely ciliate, midvein more pronounced distally, ± translucent, apex acuminate, sometimes purplish, sparsely ciliate; outer phyllaries 6–8 × ca. 1.5 mm, margin narrowly scarious; inner phyllaries 5–9 × ca. 2 mm, base ± hardened, margin broadly scarious. Ray florets 10–14, white or purple, lamina 10–15 × 2–3 mm, glabrous, eglandular; disk florets yellow, 4–5 mm, tube base flared, tube and limb glabrous, eglandular, limb campanulate, ca. 3 mm, lobes spreading, narrowly triangular, ca. 2 mm, sparsely strigose apically, eglandular. Achenes mottled purple, oblong, slightly compressed, 4–5 mm, sparsely strigillose, more densely so distally, eglandular. Outermost bristles few, slender, 0.4–0.8 mm; inner bristles 2.5–3 mm, acute; innermost bristles 3.5–4 mm, slightly clavate. Fl. Apr–Aug, fr. Jul–Sep.

- Alpine and subalpine mixed forests; 3000–3700 m. S Gansu, NW Yunnan.
- Damp rocky mountain ridges and slopes, 1600 m. Anhui, Henan, NW Hubei, S Shaanxi, Sichuan.


翼柄紫苑  yi bing zi wan

Herbs perennial, 36–100 cm tall; rhizomes long, slender, stoloniferous. Stems erect, simple, sometimes distally branched, ± flexuous, ± striate, hispid-villous, minutely stipitate glandular. Leaves cauline, slightly reduced upward, abaxially pale green, adaxially green, abaxially hispid-strigose, densely so on veins, adaxially hispid-strigose, both surfaces sparsely minutely stipitate glandular in pits, margin coarsely serrate to serrate, hispid, strigose, or villous-ciliate, midvein prominent abaxially, apex acuminate, mucronate; lowest leaves withered by anthesis (not seen); lower to upper leaves broadly winged petiolate; blade ovate to lanceolate, 3.5–5.5(–10) × 1.5–2.5(–4) cm, base cuneate-rounded to rounded; synflorescence leaves broadly winged shortly petiolate, lanceolate, 1.3–2 × 0.6–0.9 cm, base cuneate, margin 3–6-serrate, slightly resinous. Capitula 16 or more in terminal corymbiform synflorescences, ca. 1.5 cm in diam.; peduncles 7–15 mm or longer, densely hispid-strigose, minutely stipitate glandular, resinous; bracts lanceolate, entire. involucres campanulate, (4–)5–5.2 × ca. 5 mm; phyllaries 4-seriate, unequal, green apically, abaxially distally villosulous and minutely stipitate glandular, margin scarious, erose, moderately to densely villous-ciliate, midvein more pronounced distally, ± translucent, apex acute to rounded, villous-ciliate; outer phyllaries narrowly ovalate, 1.5–2 × ca. 0.8 mm; inner phyllaries obl-long, 3–6 × 1.8–1.2 mm, base hardened. Ray florets 10–14 or more, purple, tube apex and lamina base strigose, lamina 6–7(–9) × 1–1.5 mm, eglandular; disk florets yellow, (4–)5 mm, tubes base flared, tube apex and proximal limb hairy, minutely stipitate glandular, limb campanulate, ca. 3.2 mm, lobes spreading, narrowly triangular, curved, ca. 1.5 mm, apically sparsely hairy, moderately to densely minutely stipitate glandular. Achenes (immature) oblong, slightly compressed, 2–3 mm, sparsely strigillose, sparsely minutely stipitate glandular, 2-ribbed (± translucent). Pappus 4-seriate, ± reddish; outermost bristles few, slender, 0.5–0.6 mm; outer bristles slender, 2–3 mm; inner bristles few, ca. 3 mm, acute; innermost bristles ca. 4 mm, weakly clavate. Fl. and fr. Jul–Oct.

- Muddy fields; ca. 1200 m. W Hubei (Yichang).
- Shaded places in valleys of low mountains or canal banks; 800–1600 m. Anhui, Henan, NW Hubei, S Shaanxi, Sichuan.


湿生紫苑  shi sheng zi wan

Herbs, perennial, 22–70 cm tall; rhizome thick. Stems often solitary, erect, simple or branched at middle, finely canaliculate, strigillose. Leaves thick, abaxially sparsely strigillose, veins densely villous, midvein or nearly palmate veins raised, lateral veins 3-paired, conspicuous, adaxially densely scabrous; lower leaves withered by anthesis, petiolo 2–6 cm; blade cor-deate, reniform, or suborbicular, 2.5–5 × 2.2–4.5 cm; middle leaves cor-deate-ovate, margin serrate (teeth mucronulate), apex acute to acuminate; upper leaves gradually reduced, subsessile, ovate. Capitula many, in terminal corymbiform synflorescences, 2–2.5 cm in diam.; peduncles 7–12 cm; bracts oblong or linear. involucres campanulate, 6–7 × ca. 8 mm; phyllaries 4-seriate, unequal (loosely imbricate), oblong, apex obtuse; outer phyllaries ca. 2 × 0.5 mm, densely strigillose, apex leaflike; inner phyllaries ca. 5 × 0.7 mm, glabrous, margin scarious, apex obtuse to acute, often purple-red. Ray florets ca. 10, purple, tube ca. 2 mm, lamina oblong, 8–9 × 1.5–2 mm; disk florets ca. 5 mm, tube 1.5–2 mm, lobes ca. 1 mm (not seen). Achenes (not seen) oblong, ca. 2 mm, densely strigillose, 2- or 3-ribbed. Pappus (not seen) of dirty white or ± reddish, subequal bristles.

- Shaded places in valleys of low mountains or canal banks; 800–1600 m. Anhui, Henan, NW Hubei, S Shaanxi, Sichuan.

The leaf shape of *Aster limosus* is distinct from that of other species.

玉山紫菀 yu shan zi wan

Herbs, perennial, 10–40 cm tall or more, rhizomatous, stolonicferous. Stems erect, simple, sometimes branched in upper part; branches ascending, strigillose, densely leafy. Leaves cauline, slightly reduced upward, abaxially pale green, adaxially green, shiny, both surfaces scabrous, minutely stipitate glandular in pits, margin coarsely 1–5-serrate, scabrous, abaxially prominently 3-veined, apex acuminate, mucronate; lowest leaves withered by anthesis, long winged petiolate (petiole to 5.5 cm); blade spatulate to oblanceolate or lanceolate, 1.3–2.5 cm, base attenuate; lower to upper leaves shortly petiolate; blade lanceolate, 2–4 × 0.7–0.9 cm, base attenuate; synflorescence leaves shortly petiolate, lanceolate, margin entire. Capitula many in terminal paniculiform-corymbiform synflorescences (not measurable on specimen); peduncles 10–50 mm or longer, strigillose, bracts lanceolate, entire. Involucres campanulate to hemispheric, 3–5 mm; phyllaries 3-seriate, unequal, green distally, 0.7–0.9 mm wide, apically minutely glandular, margin narrowly scarious, erose, purplish, ciliate, midvein more pronounced distally, ± translucent, apex rounded, erose, purplish, ciliate; outer phyllaries broadly ovate, ca. 1.5 mm; middle phyllaries oblong, 2–3 mm, base hardened; inner phyllaries oblong, 4–5 mm. Ray florets 8–20, white, tube hairy, lamina 3.5–5(–7) × 1–1.5 mm, eglandular; disk florets yellow, 4–5.5(–6) mm, tube base flared, tube apex and limb base hairy, limb campanulate, lobes spreading, lanceolate, ca. 2 mm, glabrous, eglandular. Achenes mottled purple, oblong, slightly compressed, 1.8–2.5 mm, strigillose, eglandular, 2-ribbed. Pappus 3-seriate, white or (innermost) ± reddish; outermost bristles few, 0.5–0.7 mm; inner bristles ca. 4 mm, acute; innermost bristles ca. 4.2 mm, weakly clavate. Fl. Jul–Sep.

● Alpine areas; 3000–3700 m. Taiwan.


裸菀 luowan

Asteromoea piccolii (J. D. Hooker) Handel-Mazzetti; Gymnaster piccolii (J. D. Hooker) Kitamura; Kalimeris piccolii (J. D. Hooker) S. Y. Hu; Miyamayomena piccolii (J. D. Hooker) Kitamura.

Herbs, perennial, 60–120 cm tall, rhizomatous. Stems erect, simple, sometimes branched in upper part, finely striate, strigillose, sparsely minutely stipitate distally. Leaves cauline, gradually reduced upward, abaxially pale green (spongelike), adaxially green, both surfaces scabridulous, sometimes more sparsely so adaxially, abaxially minutely stipitate glandular in pits, margin coarsely serrate to serratate or entire (upper leaves), revolute, scabridulous, midvein prominent abaxially, apex acuminate, mucronate; lowest leaves withered by anthesis (not seen); lower to upper leaves shortly winged petiolate (petiole to 0.8 cm) or sessile, obovate or oblanceolate to narrowly lanceolate, 4–9 × 1.2–1.8 cm, base attenuate; synflorescence leaves sessile, linear-lanceolate, 2.1–2.8 × 0.4–0.5 cm, base cuneate, margin strongly revolute, entire. Capitula numerous in terminal or axillary corymbiform synflorescences; pappus 20–60 mm, strigillose, minutely stipitate glandular; bracts linear-lanceolate, entire, distally grading into phyllaries. Involucres hemispheric, 4–5 mm; phyllaries 3–6-seriate, unequal, often squarrose, green distally, abaxially distally sparsely strigillose, sparsely minutely stipitate glandular, margin scarios, erose, sometimes purplish, ciliate, midvein enlarged basally, almost keeled, distally ± translucent, apex obtuse to acute, erose, purplish, ciliate; outer phyllaries oblong, ca. 3 × 1.3 mm; middle phyllaries oblaneolate, 3.5–4 × ca. 1.2 mm, base hardened; inner phyllaries broadly oblaneolate, 4–5 × ca. 1.5 mm. Ray florets 10–26, purple-blue, veins prominent, tube sparsely minutely stipitate glandular, lamina 7–8.5 × 1–2.5 mm, glabrous; disk florets yellow, 3–4 mm, veins prominent, tube base flared, tube and limb base glabrous, minutely stipitate glandular, limb campanulate, 2–2.5 mm, lobes spreading, lanceolate, 0.8–1.5 mm, glabrous, minutely stipitate glandular. Achenes oblaneolate, 2.7–3 mm, sparsely strigose to glabrate or glabrous, minutely stipitate glandular distally, 3–6-ribbed. Pappus of ray absent, of disk 1-seriate; outermost series of scales 0.2–0.5 mm. Fl. Aug–Oct.

● Grasslands on slopes; 900–1700 m. Gansu, Guizhou, Henan, Shaanxi, Shanxi, Sichuan.

Specimens of Aster piccolii were not seen by one of us (Brouillet).


垣曲裸菀 yuan qu luowan


Herbs, perennial, ca. 57 cm tall, rhizomatous. Stems erect, simple, finely striate, glabrate at base, strigillose above. Leaves cauline, gradually reduced upward, laxly patent; lowest leaves withered by anthesis; lower to upper leaves shortly petiolate or sessile, ovate-oblong to narrowly oblong or lanceolate, 1.7–8 × 0.5–2.3 cm, thin, both surfaces sparsely strigillose, base cuneate, margin coarsely serrate to serratate, scabridulous, apex acuminate. Capitula 1–4 in terminal corymbiform synflorescences or solitary, ca. 3 cm in diam. Involucres hemispheric; phyllaries 4-seriate, unequal, green apically, abaxially scarios, erose. Ray florets purple-blue, lamina oblong, ca. 17 mm; disk florets yellow, ca. 5 mm, sparsely hairy, limb campanulate, lobes reflexed, lanceolate. Achenes dark purple, obovoid, compressed, glabrous, 2–4-ribbed. Pappus (not described and absent on illustration). Fl. Oct.

● Among shrubs in mountain valleys; 900–1000 m. S Shanxi (Yuanqu).

Material of this species was not seen by us. The description is from the original Latin description and the illustration. This species is close to Aster piccolii.

60. Aster pseudosimplex Brouillet, Semple & Y. L. Chen, nom. nov.

四川裸菀 si chuan luowan

Herbs, perennial, 10–67 cm tall. Stems ascending, solitary or 2–4, simple or 2- or 3-branched from middle part, white hispidulous-villous. Leaves: basal spatulate, long petiolate; lower cauline leaves withered by anthesis; middle leaves oblong-lanceolate or subelliptic, 1.5–2.5(–4) × 0.3–0.6(–0.9) cm, white hispidulous-villous on both surfaces, minutely stipitate glandular in pits, midvein abaxially convex, adaxially concave, base rounded, sessile, margin entire, apex obtuse or acute; uppermost leaves remote, linear, ca. 1 cm. Capitula solitary, 2–2.5 in diam. Involucres broadly campanulate, 6 × 1.5 mm; phyllaries 3- or 4-seriate, unequal; outer phyllaries green, rather short, lanceolate, 4–5 × 1.2–1.5 mm, acute or obtuse, externally pubescent; inner phyllaries ovate-oblong, 5–5.5 × 1.5–2 mm, acute, margin broadly scarious, ciliate, apically red-purplush. Ray florets purplush red, ca. 16 × 2 mm, tube ca. 2 mm, glandular puberulent; disk florets ca. 4 mm, tube ca. 1 mm, puberulent. Achenes yellowish, obovoid, slightly compressed, 2 × 1.3 mm, inconspicuously marginally ribbed, glabrous. Pappus absent. Fl. Jul–Sep.

- Grasslands on slopes, canal sides; 2600–3000 m. NW Sichuan.


Herbs, perennial, 15–48(–60) cm tall, caespitose. Stems ascending, solitary or 2–4, simple, striate, densely retorse hisrutulous. Leaves sessile, basal and lower cauline leaves withered by anthesis; middle and upper leaves dense, gradually reduced upward, lanceolate-ovate to narrowly oblong or linear, 1–3 × 0.1–0.6 cm, both surfaces strigose, abaxially pale, adaxially dark green, base truncate, margin entire, apex obtuse, mucronate. Capitula solitary, 2.5–3 cm in diam. Involucres broadly campanulate; phyllaries 3-seriate, unequal; outer series green, short, oblong, strigose; inner series obvate-lanceolate, 5–7 mm, margin broadly scarious, fimbriate, apically green or purplush. Ray florets bluish, 5–7 mm; disk florets yellow, 3–5 mm, limb funnelform, lobes lanceolate. Achenes (immature) obovoid, slightly compressed, inconspicuously 2- or 3-ribbed. Pappus absent. Fl. Jul–Aug.

- 2600–2800 m. NC Sichuan (Barkam, Lixian).

Material of this species was not seen by us. The description is from the original Latin description and the illustration. This species is close to *Aster pseudosimplex*.


- Grey leaf li xian luo wan


Herbs, perennial, 30–50 cm tall, rhizomatous. Stems erect, simple, sometimes flexuous, sometimes branched in upper part, finely striate, glabrous or glabrate, sparsely minutely stipitate glandular below leaves. Leaves cauleine, gradually reduced upward, abaxially pale green (spengelike), adaxially green, abaxially sparsely scabridulous, minutely stipitate glandular in pits, adaxially scabridulous, margin remotely serrate to serratulate, revolute, scabridulous, midvein prominent abaxially, apex acuminate, mucronate; lowest leaves withered by anthesis (not seen); lower to upper leaves winged petiolate (petiole to 2 cm); blade oblanceolate to narrowly lanceolate, (6–)10–13(–15) × 0.5–1.9 cm, base attenuate; synflorescence leaves sessile, linear-lanceolate, 2.4 × 0.3–0.4 cm, base cuneate, margin entire, grading upward into phyllaries. Capitula 1–3, terminal or axillary, overall forming corymbiform synflorescences; peduncles 60–90 mm, strigillose, minutely stipitate glandular; bracts linear-lanceolate, entire. Involucres hemispheric, 5–6 mm; phyllaries 3- or 4-seriate, unequal, green distally, glabrous, sometimes apically minutely stipitate glandular, margin scarious, erose, sometimes purplish, ciliate, midvein + translucent, sometimes multiveined, apex rounded, erose, puberulent, ciliate; outer phyllaries oblong, 3–4 × 1.2–2 mm; middle phyllaries obovate, 5.5 × 2.5–2.5 mm, base hardedened; inner phyllaries oblancoate, 6–7 × 1.1–1.5 mm. Ray florets 15–20, purple to lavender, veins prominent, tube and lamina base sparsely minutely stipitate glandular, lamina 6–7 × ca. 1.5 mm, glabrous; disk florets yellow, ca. 3.5 mm, veins prominent, tube base flared, tube and limb base glabrous, minutely stipitate glandular, limb broadly campanulate, ca. 2.5 mm, lobes spreading, narrowly triangular, 0.7–1 mm, glabrous, tip sparsely minutely stipitate glandular. Achenes narrowly obovoid, ca. 2.1 mm, glabrous, 4–6-ribbed. Pappus absent. Fl. and fr. Jul–Oct.

- Riverbanks in valleys and forest margins; ca. 600 m. Fujian, Zhejiang.


- 卢氏裸菀 li shi luo wan


Herbs, perennial, (size not given). Stems erect, terete, slightly flexuous, branched upward, densely white appressed villous. Leaves: lowest and lower cauline leaves (not seen) shortly narrowly winged petiolate or subsessile; middle and upper cauline leaves sessile, ovate, broadly elliptic, or obovate, 2–8 × 1–4 cm, abaxially gray-white appressed villous, adaxially dark green, white hispidulous, base attenuate, margin obscurely repand-crenate, lateral veins 3- or 4-paired, adaxially prominent, apex obtuse or rounded. Capitula 2–5 in loose corymbiform synflorescences, 2–3 cm in diam. Involucres campanulate; phyllaries 3-seriate, unequal, abaxially puberulent; outer phyllaries shorter, ovate; inner phyllaries longer, oblong, membranous, margin scarious, hyaline. Ray florets bluish purple, lamina 8–16 mm; disk florets numerous, yellow, 3–4 mm. Achenes
Fl. Oct.

Path sides on mountain slopes; ca. 800 m. Henan (Lushi).

The description of *Aster lushiensis* is incomplete because no specimens were seen by us.

64. *Aster verticillatus* (Reindwardt) Brouillet, Semple & Y. L. Chen, comb. nov.

Autumn qiu fen cao

Basionym: *Rhynchospermum verticillatum* Reinwardt, Syll. Pl. Nov. 2: 8. 1825; *Leptoca sa racemosa* Lessing; *R. formosanum* Yamamoto; *R. verticillatum var. subsessile* Oliver ex Miquel; *Zollingeria scandens* Schultz Bipontinus.

Herbs, perennial, 5–150 cm tall, sometimes caespitose; rhizomes long, slender. Stems erect, simple, usually divaricately branched in distal half, finely striate, strigillose, minutely stipitate glandular. Leaves cauline, gradually reduced upward, abaxially pale green, adaxially green, abaxially sparsely strigillose, more densely so on veins, minutely stipitate glandular in pits, adaxially scabridulous, eglandular, thin, margin sparsely ciliate, midvein prominent abaxially, apex acute to obtuse, mucronate; lowest leaves usually withered by anthesis, short, narrowly winged petiolate; blade obovate or ovate to lanceolate, 1.5–4.5 cm, base cuneate, margin crenate-serrate (teeth mucronulate); upper leaves narrowly reduced, petiolate or base ± subclasping, margin shallowly serrate or entire. Capitula in axils of leaves or terminal, solitary and overall in paniculate-corymbiform synflorescences, 2–3.5 cm in diam.; peduncles 0.5–2.5 cm; bracts linear. Involucres campanulate, 5–7 mm in diam.; phyllaries 3- or 4-seriate, unequal, apex green, oblong, 3–4 × 0.5 cm, abaxially globose, margin scarious, erose, ciliate, apex rounded or obtuse. Ray florets ?purplish (immature); disk florets (immature) 3.5–4 mm, tube ca. 1.5 mm, lobes ca. 0.8 mm. Achenes (imature) obovoid, ca. 2 mm, slightly compressed, 2–4-ribbed, with white short hairs. Pappus (immature) dirty white, of many unequal bristles 1.5–2 mm. Fr. Aug–Nov.

500–800 m. SW Hunan (Anhua).

The glabrate or glabrous stems and leaves are distinctive of *Aster hunanensis*.


黔中紫菀 qian zhong zi wan

Herbs, perennial, ca. 70 cm tall; rhizomes procumbent with long fibrous roots. Stems erect, slender, branched at middle, finely canaliculate, scabrous, densely leafy. Leaves abaxially pale green, adaxially brownish (when dry), both surfaces sparsely strigillose, 3-seriate, midvein abaxially prominent, lateral veins parallel with margin; basal leaves few, rosulate, long petiolar; blade obovate-lanceolate, ca. 4.5 × 2.5 cm, base attenuate, margin sparsely shallowly toothed or subentire, apex acute; lower and middle leaves oblanceolate-lanceolate, 4–10 × 1.5–2 cm, base gradually attenuate, margin 4- or 5-seriate or subentire, apex acuminate; upper leaves narrowed. Capitula in racemose-corymbiform synflorescences, ca. 2 cm in diam.; peduncles 2–3 cm; bracts linear-lanceolate, leaflike. Involucres hemispheric, ca. 8 mm in diam.; phyllaries 3-seriate, subequal, brown, oblong-lanceolate, abaxially puberulent, membranous, midvein herbaceous, apex acute or slightly acute. Ray florets ca. 10 or more, white, tube ca. 1.3 mm, lamina ca. 10 × 1.2 mm; disk florets yellow, 3–3.5 mm, tube ca. 1 mm, lobes ca. 0.5 mm. Achenes (immature) obovoid, ca. 2 mm, strigillose. Pappus (immature) white, of 10–20 unequal bristles 1–1.5 mm. Fl. Jun.


Aster menelii is probably closely related to A. hunanensis. The structure of the phyllaries and pappus is similar, but the leaf shape is different.


细茎紫菀 xi jing zi wan

Herbs, perennial, 30–60 cm tall. Stems 3–5-fascicled, erect or ascending, branched in upper part, shallowly canaliculate, red-brown in lower part, yellow villous-canescent or glabrescent, loosely leafy. Leaves abaxially pale green, sparsely hairy on veins, minutely stipitate glandular, adaxially scabrous, margin ± revolute, entire or remotely serrulate (teeth mucronulate), scabrous, midvein prominent, 3-veined, veins subparallel, reticulate veins lax, apex acute; lower leaves withered by anthesis, long petiolate, narrowly lanceolate; middle leaves shortly petiolate, linear-lanceolate, 5–9 × 0.4–0.7 cm, base attenuate, apex long acuminate, sometimes falcate; upper leaves reduced, linear to subulate. Capitula in corymbiform synflorescences, 2–2.5 cm in diam. Involucres campanulate, ca. 5 × 8–10 mm; phyllaries 3- or 4-seriate, unequal, margin scarious, erose, ciliate, midvein green, apex obtuse; outer phyllaries linear-oblong, 2–2.5 × ca. 0.7 mm, apically leaflike; inner phyllaries ca. 4.5 × 1 mm, apically purple-red. Ray florets to 20, blue-purple, tube ca. 2.5 mm, lamina ca. 9 × 2.5 mm; disk florets ca. 4 mm (immaure). Achenes (immature) black, obovoid, ca. 2 × 1.5 mm, strigillose, 2- or 3-ribbed. Pappus (immature) white, 3.5–4 mm. Fl. Jul.

● Slopes, among shrubs, gullies; 1000–1300 m. S Gansu (Hui-xian, Qingyan).


大埔紫菀 da pu zi wan

Herbs, perennial, ca. 3 cm tall, scapiform; rhizomes slender and long, woody. Stems usually simple, erect, sometimes decumbent, laxly leafy. Leaves densely strigose; basal leaves rosulate, present at anthesis, winged petiolate, obovate or oblong, 1.5–2 × ca. 0.7 cm, thick, base gradually attenuate, margin serrate (teeth mucronulate), apex obtuse or ± acute; cauline leaves gradually smaller, shortly petiolate or sessile, spatulate or lanceolate, base attenuate, apex acute. Capitula 1 or 2, shortly pedunculate, erect, ca. 8 mm in diam. Involucres hemispheric, 4–7 mm, tinged purple-red; phyllaries 2-seriate; outer phyllaries lanceolate, short, margin fimbriate-ciliate, scabrous, apex acuminate. Ray florets white, 7.5–7.7 mm, tube ca. 1.6 mm; disk florets ca. 3.6 mm, tube ca. 1.2 mm, limb campanulate, lobes lanceolate, ca. 2 mm, glabrous. Achenes (immature) strigose. Pappus (immature) dirty white, often tinged yellow, or reddish, ca. 2 mm.

● Stony mountains. Taiwan.

The original description of Aster itsunboshi was translated from Kitamura. The material seen at PE was damaged in the area of the capitula so some floral and achene characters could not be determined. According to Soejima and C. I. Peng (Fl. Taiwan, ed. 2, 4: 855–857, 1998), citing Kitamura, this may be a juvenile form of A. morrisonensis. If this hypothesis were to prove incorrect, the species might be best treated in A. sect. Alpigeni.

69. Aster molliusculus (Lindley ex Candolle) C. B. Clarke, Compos. Ind. 45. 1876.

软毛紫菀 ruan mao zi wan

Diplopappus molliusculus Lindley ex Candolle, Prodr. 5: 277. 1836; D. roylei Lindley ex Candolle.

Herbs, perennial, 8–30(–40) cm tall, caespitose; caudex taprooted, sometimes thick and woody. Stems erect, simple, sometimes branched in upper part, sparsely villous, more densely so upward and below leaves, very sparsely to moderately minutely stipitate glandular, resinous. Leaves cauline, usually gradually increased upward, abaxially pale green (± spongellike), adaxially green, abaxially glabrous or sparsely strigose or villosulous, veins sparsely strigillose to strigose, sparsely minutely stipitate glandular in pits, adaxially glabrous, strigose, sparsely scabridulous, or sparsely villousulous, sometimes resinous, margin sparsely ciliate, midvein prominent abaxially, apex acute, mucronate; lowest leaves usually withered by anthesis, scaly, marcescent; lower to upper leaves shortly petiolate (petiole to 1 cm), oblongate to narrowly oblongate, 1–3.5 × 0.3–0.8 cm, base attenuate to cuneate, margin sometimes revolute, entire (lower) or 2–6-serate (upper). Capitula terminal, solitary (rarely 2) on branches; peduncles 3–13 mm, sparsely to densely strigillose, sometimes minutely stipitate glandular; bracts linear-lanceolate, entire. Involucres campanulate, 7–10 mm; phyllaries 2- or 3-seriate, unequal, green distally, linear-lanceolate, 0.5–1.1 mm wide, glabrous or strigillose on midvein, eglandular, margin scarious, erose, ciliate, midvein swollen or ridged proximally, ± translucent, apex acuminate, erose, purplish, ciliate; outer phyllaries 4–5 mm; middle phyllaries 6–7 mm, base hardened; inner phyllaries 6–9 mm. Ray florets 15–25, white or pink, tube hairy, sometimes minutely stipitate glandular; lamina 5–9 × 1.5–2.1 mm; disk florets yellow, 5–6 mm, tube base flared, tube and limb base sometimes sparsely hairy, minutely stipitate glandular, limb ± campanulate, 3–5.5 mm, lobes spreading, narrowly triangular, 0.8–1 mm, glabrous, eglandular. Achenes oblong, slightly compressed, 3–4 mm, moderately to densely strigillose, eglandular, 4-ribbed. Pappus 4-seriate, dirty white; outermost series ± scaly, 0.5–1.5 mm; outer bristles few, slender, 2.5–3.5 mm; inner bristles 4.5–5.5 mm, acute; innermost bristles 5–6.5 mm, weakly clavate to clavate. Fl. May–Jun, fr. Jun–Sep. 2n = 18, 27.

Alpine and subalpine stony slopes; 1800–3500 m. W Xizang [NW India, Kashmir, Pakistan].


锡金紫菀 xi jin zi wan

Subshrubs or herbs, perennial, 50–80 cm tall, rhizomatous. Stems erect, simple, stout, flexuous, ± woody at base, purplish, finely striate, strigillose, villosulous, sparsely minutely stipitate glandular, particularly below leaves. Leaves cauline, slightly reduced upward, abaxially pale green, glabrous, veins sparsely strigillose, minutely stipitate glandular, sometimes in pits, adaxially green, densely scabridulous, margin coarsely serrate, ciliate, veins prominent, apex long acuminate, mucronate; lowest leaves withered by anthesis (not seen), broadly winged peti-
Aster nigromontanus Dunn, J. Linn. Soc., Bot. 35: 501. 1903 ["nigromontana"].

Herbs, perennial, 40–50 cm tall, rarely caespitose, rhizomatous. Stems erect, simple, stout, flexuous, shallowly striate, glabrous proximally, sparsely strigillose distally, eglandular. Leaves: basal leaves in a rosette, disappearing before stem elongation, winged (petiole to 2.5 cm) or shortly petiolate; blade abaxially pale green, adaxially green, oblong, 4–6 × 1.5–2.5 cm, slightly reduced upward, abaxially glabrous, veins sparsely strigillose, very sparsely minutely stipitate glandular in pits, adaxially densely scabridulous, very sparsely minutely stipitate glandular in pits, base abruptly attenuate, margin coarsely serrate (teeth mucronate), ciliate, midvein prominent, apex acuminate, mucronate; lowest leaves withered by anthesis (not seen); lower leaves (not seen) to upper leaves shortly broadly winged petiolate (base clasping) or sessile, lanceolate, 11.5–17 × 2.8–6 cm, base attenuate; synflorescence leaves sessile, lanceolate, ca. 3.3 × 1 cm, base auriculate, clasping, rapidly becoming bracts. Capitula numerous, in terminal corymbiform synflorescences, 1.5–1.8 cm in diam.; peduncles 10–20 mm, densely strigillose, minutely stipitate glandular; bracts linear-lanceolate, entire. Involucres campanulate, 4–6×4 cm, phyllaries 2- or 3-seriate, subequal, sometimes squarrose, green distally, oblanceolate to lanceolate or linear-lanceolate (inner phyllaries), 3.5–4.5 × 0.5–1 mm, abaxially sparsely strigillose, mainly on veins, sparingly to moderately minutely stipitate glandular, margin scarious to narrowly scarious, erose, sparsely ciliate, midvein more pronounced distally, ± translucent, apex acuminate, purplish, sparsely ciliate. Ray florets 30–35(–60), white, rose, blue, or purple, tube apex sparsely stipitate glandular, lamina 4–5 × ca. 1 mm, glabrous; disk florets yellow, becoming purplish, 3.5–4 mm, tube base flared, limbus campanulate, ca. 3.2 mm, hairy, very sparsely stipitate; disk florets yel- low, ca. 5 mm, tube base flared, veins prominent, translucent, limb campanulate, ca. 3.2 mm, hairy, very sparsely stipitate glandular, lobes spreading, narrowly triangular, ca. 1.2 mm. Achenes (immature) obovoid, slightly compressed, ca. 3 mm, sparsely strigillose, minutely stipitate glandular; bracts linear-lanceolate, entire. Involucres campanulate, 5–6 × 6–7 mm; phyllaries 2- or 3-seriate, subequal, green, lanceolate to oblanceolate, 4–6 × 1–1.2 mm, abaxially sparsely strigillose proximally on veins, moderately to sparsely minutely stipitate glandular proximally, margin scarious or narrowly scarious, erose, sparsely ciliate, midvein more pronounced basally, ± translucent, apex acuminate, sometimes purplish, eciliate. Ray florets 25–30, white, tube hairy, stipitate glandular, lamina 5–7 × 1–1.2 cm, (2-veined), glabrous, eglandular; disk florets yellow, ca. 5 mm, tube base flared, veins prominent, translucent, limb campanulate, ca. 3.2 mm, hairy, very sparsely stipitate glandular, lobes spreading, narrowly triangular, ca. 1.2 mm. Achenes (immature) obovoid, slightly compressed, ca. 3 mm, sparsely strigillose, sparsely minutely stipitate glandular apically, 2-ribbed. Pappus 3- or 4-seriate, dirty white or slightly reddish; outermost bristles slender, ca. 0.5 mm; outer bristles few or none, slender, ca. 3 mm; inner bristles ca. 4.2 mm, acute; innermost bristles 4.6–4.7 mm, clavate. Fl. unknown, fr. Nov.

- Grasslands on slopes; 1500–3000 m. Yunnan (Jingdong, Meng-zi).

The above description of Aster nigromontanus is based on the co-
type at MO.


镰叶紫菀 he shan zi wan
Aster brachyphyllus  C. C. Chang (1935), not (Sonder) F. Mueller (1865).

Herbs, perennial, 30–55 cm tall; rhizomes long, slender. Stems erect, simple, or sometimes branched in upper part, finely striate, shiny, resinous, leafy, sparsely to densely villous to strigillose, sparsely or densely minutely stipitate glandular. Leaves cauline, slightly reduced upward, abaxially pale green, glabrous, veins sparsely strigillose, minutely stipitate glandular in pith, adaxially green, scabridulous, sparsely minutely stipitate glandular on veins, ± resinous, margin serrate to remotely serrate, ciliate, midvein prominent abaxially, sometimes 3-veined, reticulate venation prominent, apex acuminate to falcate-acuminate, mucronate; lowest leaves withered by anthesis, shortly winged petiolar; blade obovate to oblanceolate, 0.7–9 cm, base tapering; lower to upper leaves shortly petiolar (petiole to 0.3 cm); blade broadly to narrowly lanceolate, sometimes falcate, 2.7–7 × 0.6–1.7 cm, base rounded. Capitula 6–20 in terminal or axillary, racemiform synflorescences, sometimes distributed along much of stem, 2.5–3 cm in diam., sessile or peduncles 0.1–20 mm, densely strigillose, minutely stipitate glandular, resinous; bracts linear-oblancoate, entire, sometimes crowded below head, often grading into phyllaries. Involucres campanulate, 6–8 × 8–12 mm; phyllaries 4- or 5-seriate, unequal, green apically, often square-square, falcate, 0.7–1 mm wide, margin narrowly scarious, erose, ciliate (outer phyllaries) to densely villous-ciliate (inner phyllaries) distally, midvein more pronounced distally, plus 3–7 dark green striae, apex obtuse to rounded, tip purplish (sometimes whole apex purplish), eciliate, minutely stipitate glandular, thinly to thickly resinous; outer phyllaries lanceolate, 1.5–3 mm; middle phyllaries oblanceolate, 4–7 mm, base hardened; inner phyllaries oblange-oblong, 6–9 mm. Ray florets 30–35, white or lavender, tube apex and lamina base sparsely hairy, lamina 6–8 × 1–1.5 mm, eglandular; disk florets yellow, ca. 6 mm, tube base flared, limb campanulate, 3–5 mm, lobes spreading, tip recurved, narrowly triangular, ca. 1.5 mm, glabrous, eglandular. Achenes reddish brown, narrowly obovoid, slightly compressed, ca. 3 mm, strigillose, apically sparsely minutely stipitate glandular, 4- or 5-ribbed. Pappus 4-seriate, white; outermost bristles few, slender, 0.5–0.7 mm; outer bristles slender few, 3.5–4 mm, inner bristles 4.1–4.9 mm, tapering; innermost bristles 6–6.2(–6.5) mm, ± clavate. Fl. Aug–Oct, fr. Oct–Nov.

- Open forests, thickets, grasslands, hillsides, stream banks, shaded places; 200–800 m. Anhui, Fujian, Jiangsu, Jiangxi, Zhejiang.

The distinction between the two varieties of Aster turbinatus needs to be investigated.

1a. Lower leaf blade ovate or ovate-lanceolate, base truncate or rounded; ray floret lamina purple, ca. 14 × 2.5–3 mm. 74a. var. turbinatus

1b. Lower leaf blade pandurate, base deeply auriculate-clasping; ray floret lamina white, smaller. 74b. var. chekiangensis

74a. Aster turbinatus var. turbinatus

陀螺紫菀(原变种) tuo luo zi wan (yuan bian zhong)

Lower leaf blade ovate or ovate-lanceolate, base truncate or rounded. Ray floret lamina purple, ca. 14 × 2.5–3 mm.

- Hillsides, stream banks, shaded places; 200–800 m. Anhui, Fujian, Jiangsu, Jiangxi, Zhejiang.

74b. Aster turbinatus var. chekiangensis


仙白草 xian bai cao

Lower leaf blade pandurate, base deeply auriculate-clasping. Ray floret lamina white, smaller.

- Open forests, thickets, grasslands. Zhejiang.

75. Aster baccharoides

Herbs, perennial, 60–100 cm tall, rhizomatous. Stems erect, simple, or sometimes branched in upper part, finely striate, villous, sparsely minutely stipitate glandular below leaves. Leaves cauline, gradually reduced upward, abaxially pale green, adaxially green, both surfaces moderately scabrous, more densely so adaxially, very sparsely minutely stipitate glandular, margin serrate to serrulate (teeth mucronulate), scabrous, midvein prominent abaxially, apex acute to acuminate, mucronate; lowest leaves (partly observed) withered by anthesis, narrowly winged petiolar; lower to upper leaves shortly winged petiolar (lower leaves), pandurate or ovate to ovate-lanceolate, 3.5–10.5(–15) × 0.8–2.8 cm, base truncate or rounded or auriculate-clasping; synflorescence leaves sessile, lanceolate to ovate, 0.8–3 × 0.4–0.8 cm, base rounded, ± clavate. Capitula 1–10 in terminal racemiform synflorescences; peduncles 2–15 mm, strigillose; bracts numerous, sometimes overlapping, lowest bracts leaf-like, ciliate, middle and upper bracts phyllary-like. Involucres campanulate, 10–12 × 10–18 mm; phyllaries 5- or 6-seriate, unequal, green apically, abaxially glabrous, eglandular, margin scarious, erose, purplish, ciliate, midvein somewhat more pronounced distally, ± translucent, apex obtuse, erose, purplish, ciliate; outer phyllaries broadly ovate, ca. 3 × 2.5–3 mm; middle phyllaries ovate to oblanceolate, 5–7 × 2–3 mm, base ± hardened; inner phyllaries oblong to narrowly oblong, 8–12 × 1.2–1.8 mm. Ray florets 20–27, white or purple, lamina 10–11–14 × 1.5–1.6(–3) mm, glabrous, eglandular; disk florets yellow, ca. 6 mm, tube base flared, limb campanulate, 3.5 mm, lobes spreading, tip recurved, narrowly triangular, ca. 1.5 mm, glabrous, eglandular. Achenes mottled red, narrowly obovoid, slightly compressed, ca. 3 mm, strigillose, apically sparsely minutely stipitate glandular, 4- or 5-ribbed. Pappus 4-seriate, white; outermost bristles few, slender, 0.5–0.7 mm; outer bristles slender few, 3.5–4 mm, inner bristles 4.1–4.9 mm, tapering; innermost bristles 6–6.2(–6.5) mm, ± clavate. Fl. Aug–Oct, fr. Oct–Nov.

Low shrubs or perennial herbs, 15–150 cm tall, basally woody, rhizomatous. Stems erect, branched or sometimes simple (herb), finely striate, densely strigose, minutely stipitate glandular. Leaves cauleine, slightly reduced upward, abaxially pale green, moderately striate, moderately to densely minutely stipitate glandular, axially green, densely scabridulous, minutely stipitate glandular, margin serrate to serrulate (teeth mucronulate), scabrous, midvein prominent abaxially, apex acute, mucronate; lowest leaves withered by anthesis (herb), lower to upper leaves shortly winged petiolate; blade narrowly ovate to lanceolate, 1.3–7.5 × 0.4–1.8 cm, base attenuate to rounded; synflorescence leaves shortly petiolate, broadly lanceolate to oblanceolate, 0.7–3 × 0.3–0.8 cm, base cuneate to rounded, margin entire. Capitula numerous, in terminal or axillary corymbiform to paniculiform synflorescences, 1.5–2 cm in diam.; peduncles 2–8 mm, strigillose; bracts oblanceolate, margin entire, becoming phyllary-like distally. Involucres campanulate, 6–7 × ca. 7 mm; phyllaries 5–7-seriate, unequal, narrowly green apically, sometimes distally purplish, abaxially moderately to densely strigose, more so distally, sparsely to moderately minutely stipitate glandular, margin scarious (more broadly so in inner phyllaries), erose, villous-ciliate, midvein somewhat more prominent distally, ± translucent, sometimes 3-veined, apex acute to obtuse or rounded, erose, sometimes micro or tip pubescent, ciliate; outer phyllaries broadly lanceolate to lanceolate, 1.5–2 × 0.7–1 mm; middle phyllaries lanceolate-oblong, 3–5 × 1–1.2 mm, base ± rounded; inner phyllaries oblong, 6–7 × 1–1.5 mm. Ray florets 8–18, white, lamina ca. 6 × 1.2–1.7 mm, glabrous, eglandular; disk florets yellow, 4.5–6.5 mm, tube base flared, veins marked), limb campanulate, 2.5–3.5 mm, glabrous, minutely stipitate glandular proximally, lobes spreading, tip recurved, narrowly triangular, 1.2–2 mm, glabrous, eglandular. Achenes dark purple, oblong, slightly compressed, ca. 3.5 mm, strigillose, apically sparsely minutely stipitate glandular, 2-ribbed. Pappus 4-seriate, white, of slender bristles; outermost bristles 1–3, 0.5–1.2 mm; outer bristles absent or 1, ca. 3 mm; inner bristles 4–5 mm, acute; innermost bristles 5–6 mm, clavate. Fl. Jul.–Oct. fr. Aug.–Nov.

- Slopes, grasslands, shrublands, sandy areas, sea bluffs, roadsides; sea level to 1000 m. Fujian, Guangdong, E. Guangxi, Hunan, Jiangxi, Zhejiang.

*Aster baccharoides* is closely related to *A. turbinatus* but differs in having basally woody stems, narrow leaves, small capitula and florets, and white ray floret lamina.


岳麓紫菀 yue lu zi wan

Herbs, perennial, rhizomatous. Stems erect, 40–60 cm tall, slender, canaliculate, woody at base, covered with spreading or crisped short hairs, shortly branched at middle part, with scattered leaves. Leaves abaxially sparsely hispidulous, rarely sparsely hispidulous on veins, adaxially sparsely puberulent, glabrescent, sometimes glandular, margin ciliate, midvein abaxially prominent, lateral veins indistinct; basal leaves absent at anthesis; lower cauline leaves broadly winged petiolate; blade oblong or narrowly elliptic, 3–7 × 0.7–1.5 cm, base attenuate, margin entire or sparsely serrate (teeth mucronate), apex obtuse or acute; upper leaves often sessile, 0.5–2.5 mm, margin entire, apex rounded. Capitula 1–3, axillary at short branches and arranged in paniculate corymbs, ca. 1.5 cm in diam.; peduncles to 2 cm; bracts few, lanceolate, leathlike. Involucres campanulate or obconic, 4.5–5 × 6–6 mm; phyllaries ca. 4-seriate, unequal; outer phyllaries dark brown, ovate, 1–2 × ca. 1 mm, pubescent, apex mucronate; inner phyllaries oblong, ca. 4 × 1.2 mm, margin shortly ciliate, apex hairy. Ray florets ca. 10, white, tube ca. 3 mm, lamina ca. 4 × 1.5–2 mm; disk florets ca. 4 mm, tube ca. 1.5 mm, sparsely hairy, lobes ca. 1.5 mm. Achenes oblong, ± compressed, 1.5–2 mm, strigose. Pappus white, bristles to 4 mm. Fr. Jul.–Sep.

- Roadsides on slopes; 600–900 m. Hunan, Jiangxi.

No specimens of *Aster sinianus* were seen by one of us (Brouillet).


毡毛紫菀 zhan mao zi wan

Herbs, perennial, ca. 50 cm tall (lower part not seen). Stems slender above middle, branched, puberulent, upper part white velutinous, densely or loosely leafy in upper part. Leaves abaxially gray-green, adaxially somewhat shiny, (lower leaves not seen); middle leaves sessile or shortly petiolate (petiole ca. 1.5 mm); blade lanceolate, 4–7.5 × 0.9–1.6 cm, abaxially densely velutinous, adaxially glabrous, villosulous at base and on veins, thin, base slightly rounded or subcuneate, margin slightly revolute, entire, scabrous, trilinerved, veins ± prominent abaxially, lateral veins 6 or 7 pairs, apex acuminate, sometimes falcate, mucronate. Capitula 2 or 3 at ends of branches, in ± corymbiform synflorescences; shortly pedunculate. Involucres campanulate, 4–5 mm; phyllaries 4- or 5-seriate, unequal; outer phyllaries ovate, ca. 1.5 mm, abaxially puberulent; inner phyllaries oblong, ca. 4 mm, margin narrowly scarious, apex rounded to obtuse, thick. Ray florets not seen; disk florets yellow, 3.4–3.8 mm, tube 1.2–1.3 mm, limb narrowly campanulate, lobes lanceolate, 1.1–1.2 mm, apically glandular and villosulous. Achenes brown, narrowly oblong, slightly compressed, ca. 2.9 mm, sparsely strigose, moderately so distally, pale 5- or 6-ribbed. Pappus reddish brown, 2-seriate; inner series ca. 3 mm, acute; innermost series 3.3–3.6 mm, clavate. Fl. Jul.

- Thickets on mountains; ca. 200 m. Guangxi.

Ray florets were not observed by us on the available specimens of *Aster velutinosus*; the capitula on the type specimen are too immature. On the fruiting specimen, however, there is no sign of ray florets, including on a head that was not fully opened; only disk florets were seen there.


卵叶紫菀 luan ye zi wan

Herbs, perennial, 40–100 cm tall. Stems sparsely branched, tomentose above. Leaves: basal leaves withered at anthesis;
cauline leaves crowded, sessile or shortly petiolate (petiole ca. 2 mm), adaxially pale green, ovate, 3.5–5.5 × 1.5–2.5 cm, slightly papery, both surfaces hispidulous, abaxially gland-dotted, base rounded, margin subentire or sparsely serrate at middle part, basally 3-veined, apex acute; upper leaves smaller, few near synflorescence, 0.8–1.5 cm. Capitula numerous, in paniculate-corymbiform synflorescences, 0.6–1.5 cm in diam.; peduncles 0.5–1.6 cm, erect or spreading, ± strict, densely pubescent, sometimes with a bract ca. 1 mm. Involucres campanulate, 6–7 × ca. 7 mm; phyllaries 4- or 5-seriate, unequal, oblong-lanceolate, margin entire, ciliate, apex brown, obtuse to rounded; outer strigose, 4–6-ribbed. Pappus dirty white or reddish brown, of phyllaries 1.5–2 mm; inner phyllaries gradually longer, 4–4.5 × ca. 7 mm; phyllaries 4- or 5-seriate, unequal, oblong-lanceolate to ovate, oblong, or lanceolate to linear-lanceolate, margin flat, entire or serrate to coarsely serrate, rarely deeply pinnatifid, 1-veined. Capitula radiate, terminal, solitary at ends of scapiform stems, rarely 2–8 in corymbiform synflorescences. Involucres hemispheric to broadly campanulate; phyllaries 2- or 3-seriate, equal or subequal (outer sometimes shorter), rarely unequal, leaflike or upper part leaflike, not keeled, margin sometimes scarious. Receptacles flat or ± convex. Ray florets 1-seriate, 10–60(–100), purplish, mauve, lavender, lilac, blue, pink, or white; disk floret limb funnelform to narrowly funnelform, sometimes campanulate, lobes equal. Achenes broadly to narrowly obovoid or oblong to oblanceoloid, ± compressed, 2–(4)-ribbed. Pappus of ray and disk florets 1–4-seriate, of persistent, rarely caducous, numerous free bristles, innermost series clavate, outermost series of short bristles, sometimes scales.

About 50 species: C, NE, and SW Asia, Europe, and North America; 44 species (28 endemic) in China.
1a. Outer phyllary margin broadly scarious.
2a. Phyllaries linear to obovate-oblong; capitula 2–8, in corymbiform synflorescences ........................................ 121. *A. seneciodes*
2b. Phyllaries lanceolate to linear-lanceolate; capitula terminal, solitary.
3a. Phyllaries 6–12 mm; plants 3–15 cm tall ........................................ 122. *A. batangensis*
3b. Phyllaries 5–7 mm; plants ca. 45 cm tall .................................... 123. *A. rockianus*
1b. Outer phyllary margin leaflike or hardened basally, sometimes narrowly or broadly scarious.
4a. Pappus 3- or 4-seriate, inner series of bristles equaling disk corollas, white, whitish, or somewhat tinged red, outermost series of scales.
5a. Phyllaries unequal, outer shorter than inner ones; leaf margin pinnatisect ........................................ 120. *A. bipinnatisectus*
5b. Phyllaries subequal or equal; leaf margin entire or remotely serrate to serrulate.
6a. Ray floret lamina linear-lanceolate.
7a. Plants with tuberoid roots.
8a. Involucres 6–9 mm in diam., phyllaries 1–1.5 mm wide; disk florets orange-yellow, lobes minutely purple stipitate glandular .......................................................... 109. *A. asteroides*
8b. Involucres 6–7 mm in diam., phyllaries 1.5–3 mm wide; disk florets yellow, purplish brown distally, lobes sparsely minutely stipitate glandular .......................................................... 110. *A. likiangensis*
7b. Plants long rhizomatous.
9a. Involucres 2–3 cm in diam.; disk florets yellow or purplish tinged ......................................... 113. *A. tsarungensis*
9b. Involucres 1.5–2(–3) cm in diam.; disk florets orange to yellow.
10a. Plants densely or sparsely villous, usually also glandular, or leaves glabrate; involucres 1.5–2(–3) cm in diam., phyllaries 1–2 mm wide ................................. 111. *A. flaccidus*
10b. Plants densely white hisporate or villous or tomentose; involucres ca. 1.5 cm in diam., phyllaries ca. 1 mm wide ........................................ 112. *A. hololachnus*
6b. Ray floret lamina linear.
11a. Stems 5–12 cm .................................................................................. 119. *A. brevis*
11b. Stems 13–75 cm.
12a. Phyllaries linear-lanceolate, 1–1.5 mm wide, apex acuminate to long acuminate.
13a. Inner phyllary margin scarious, abaxially brown stipitate glandular ....................................................... 117. *A. lipskii*
13b. Phyllary margin narrowly scarious, villous, eglandular, inner series often glabrate ....................... 118. *A. farreri*
12b. Phyllaries (1–)2–5 mm wide, apex acute or acuminate.
14a. Phyllaries dark colored stipitate glandular, ± villos along veins; disk florets orange to yellow, apex blackish or brownish purple ......................................................... 114. *A. diplostephioideus*
14b. Phyllaries white villous, sometimes glandular; disk florets yellow to orange.
15a. Middle and upper cauline leaves lanceolate or oblong to oblanceolate; involucres 1.5–2.5 cm in diam., phyllaries 0.8–4(–5) mm wide ........................................ 115. *A. yunnanensis*
15b. Middle and upper cauline leaves lanceolate to linear; involucres 0.8–0.9 cm in diam., phyllaries 1.5–2 mm wide ........................................ 116. *A. setchuenensis*
4b. Pappus 2–4-seriate, of barbellate bristles, sometimes outer series of few slender bristles or scales.
16a. Phyllaries lanate.
17a. Disk corolla tube and limb sparsely villosulose, lobes lanate .................................................. 107. *A. prainii*
17b. Disk corolla tube and limb without long hairs .................................................. 108. *A. neolamuginosus*
16b. Phyllaries abaxially pilose, pilosulose, scabridulous, strigilllose, strigose, hisporate-villosus, hispidsulous, hispidulous, villous or villosulose to lanate, glabrate, or glabrous, sometimes glandular.
18a. Phyllaries leaflike at least apically, apex acute or acuminate.
19a. Pappus brown, purplish, or reddish brown, sometimes also yellowish at base.
20a. Achenes not winged.
21a. Pappus 3-seriate, outermost series of short bristles or scales, inner series of distally brown bristles; achenes obovate-oblong, sparsely strigose; ray florets 25–30, lamina 10–20 mm ........ 101. *A. latibracteatus*
21b. Pappus 2–4-seriate, outermost series of scales or slender bristles, inner series of reddish brown or brown bristles; achenes obovoid; ray florets 44–100, lamina 20–30 mm. .......................... 22a. Pappus 3- or 4-seriate, outermost series of few slender bristles or none, inner series of barbellate bristles; achenes glabrous or distally glabrate, minutely stipitate glandular .................................. 103. *A. bietii*
22b. Pappus 2-seriate, outermost series of narrow to broad scales, inner series of barbellate bristles; achenes sparsely strigillose, eglandular .................................................. 102. *A. bulleyanus*
20b. Achenes winged.
23a. Basal leaves present at anthesis, middle and upper cauline leaves oblong to linear-lanceolate ... 106. *A. jeffreyanus*
23b. Basal leaves withered at anthesis, middle and upper cauline leaves ovate, oblong, or ovate-lanceolate.
24a. Capitula 3.5–4 cm in diam.; outer phyllaries 5–7 mm wide, hispidulous; lamina ca. 14 × 0.7 mm; pappus longer than tube of disk florets ...................................................... 104. *A. platylepis*
ASTEREAE

18b. Phyllaries of outer series leaflike or leaflike above, often hardened at base, apex rounded, obtuse, or acuminate.

19b. Pappus white or whitish, reddish, yellowish, or straw-colored to brownish.

25a. Stems erect ................................................................. 100. A. retusus

25b. Stems ascending.

26a. Plants with long slender stolons (to 30 cm) .............................................................. 99. A. stracheyi

26b. Plants without stolons or with short stolons.

27a. Plants eglandular; pappus straw-colored to brownish reddish brown.

28a. Phyllaries leaflike, margin broadly scarious; ray florets 11–30; achenes strigose distally .......... 95. A. salvinensis

28b. Phyllaries membranous, apex leaflike in outer series, inner bristles with broadly scarious margins; ray florets 13–17; achenes densely strigose ........................................ 96. A. tientschwanensis

29b. Pappus reddish based, whitish above; phyllaries 3–5 mm wide; ray florets 80 or more ........... 98. A. alpinus

30a. Pappus purplish to reddish- or purplish brown, of many bristles; capitula terminal, solitary, or 2–4, solitary at ends of stem and branches.

30b. Pappus white, dirty white, straw-colored, or sometimes buff, ± equaling or longer, rarely shorter, than disk florets, often with outer series of few short, slender bristles.

31a. Pappus reddish brown or yellowish, of many bristles; capitula terminal, solitary, or 2–4, solitary at ends of stem and branches.

32a. Capitula terminal, solitary; phyllaries densely pilose; ray florets 11–13(–15), white; plants 4–7 cm tall, without stolons ................................................................. 93. A. fanjingshanicus

32b. Capitula 1–4, solitary at ends of stems and branches; phyllaries abaxially sparsely scabridulous; ray florets 12–20, blue-purple; plants 24–40 cm tall, with stolons ........................................ 94. A. giraldii

33a. Phyllaries squarrose, both surfaces densely hirsutulous; ray florets ca. 100 .................... 92. A. megalanthus

33b. Phyllaries appressed or sometimes squarrose, ± hairy or glabrous abaxially; ray florets 30–70.

34a. Rhizomes slender, often with stolons; leaves scabridulous or hirsute, phyllaries villosulous .... 90. A. tongolensis

34b. Rhizomes robust; leaves glabrate to sparsely pilosulous, phyllaries abaxially sparsely to densely pilosulous distally or glabrous, margin densely pilose-ciliate or eciliate ...................... 91. A. souliei

35a. Pappus purplish straw-colored; leaf surfaces strigose .................................................. 89. A. handelii

35b. Pappus white or dirty white, reddish, purplish, buff, or straw-colored; leaf surfaces ± villous, hirsute-villos, pilose, scabrous, strigose, or strigillose.

36a. Phyllaries oblong or lanceolate, apex acute, 1–1.5 mm wide; involucre 0.7–1.5 cm in diam.

36b. Phyllaries lanceolate to oblanceolate, spatulate, oblong, or linear, apex obtuse, rounded, acute, or sometimes acuminate, 1.3–3 mm wide, involucre 0.6–2 cm in diam.

37a. Basal leaves withered and lower cauline withered or present at anthesis; stems 15–45 cm tall; pappus straw-colored or sometimes purplish ........................................ 86. A. lingulatus

37b. Basal and lower cauline leaves present at anthesis; stems 40–75(–100) cm tall; pappus whitish ................................................................. 88. A. neoelgeans

38a. Cauline leaves rather similar in size and ± evenly distributed on stem; involucre 2–2.8 cm in diam.; phyllaries oblanceolate, 2–3 mm wide, glabrate (margin ciliate) ............. 87. A. tricephalus

38b. Cauline leaves reduced upward; involucres 0.6–2 cm in diam.; phyllaries 1.3–2.5 mm wide, densely or sparsely hairy.

39a. Basal leaves withered at anthesis ................................................................................... 85. A. ionoglossus

39b. Basal leaves present or withered and marcescent at anthesis.

40a. Pappus reddish or buff, barbellate above ................................................................. 84. A. barbellatus

40b. Pappus white, dirty white, barbellate throughout.

41a. Disk floret lobes unequal ......................................................... 83. A. takasagomontanus

41b. Disk floret lobes equal.

42a. Phyllaries unequal ......................................................................................... 82. A. heterolepis

42b. Phyllaries equal or subequal.

43a. Involucres 0.6–1 cm in diam.; outer phyllaries lanceolate to oblanceolate, apex rounded or obtuse to acute or acuminate; capitula solitary, terminal ................................ 80. A. alpinus

43b. Involucres 1–1.2 cm in diam.; outer phyllaries oblanceolate or spatulate, apex rounded or acute; capitula 2–30 in terminal corymbiform synflorescences, rarely solitary ................................................... 81. A. oreophilus

高山紫菀 *gao shan zi wan*

Herbs, perennial, 10–35 cm tall, caespitose; rhizomes robust. Stems erect, simple, sparsely to densely villous, sparsely to moderately minutely stipitate glandular. Leaves basal and cauline, rosette marcescent at anthesis; cauline leaves much reduced upward, sparsely to moderately villous, sometimes sparsely minutely stipitate glandular, 3-veined, main veins ± prominent; basal leaves rosulate, petiolate, obovate to spatulate; lower cauline leaves with petiolar winged, sometimes slender, up to 11 cm; blade linear-oblong, 1–10 × 0.4–1.5 cm, base attenuate, margin entire, sometimes undulate, apex rounded; middle cauline leaves sessile, oblance-lanceolate to linear, base attenuate. Capitula solitary, terminal, 3–3.5(–5.5) cm in diam.; bracts linear to linear-lanceolate, 1-veined. Involucres hemicampanulate. Capitula solitary, terminal, 3–3.5(–5.5) cm in diam.; bracts linear to linear-lanceolate, 1-veined. Involucres hemicampanulate. Capitula 3–3.5 cm in diam. Phyllaries subequal, linear, ca. 10 × 1.5 mm, densely pubescent or densely villous, apex obtuse or obtusely rounded.

This species is very variable. Many subspecies and varieties have been recognized by previous authors. Specimens from Xiaowutai Shan (Hebei) and Taibai Shan (Shaanxi) that were identified by Handel-Mazzetti and Onno as *Aster alpinus* var. *vierhapperi* (Onno) Cronquist, *Vasc. Pl.* Pacific North W. 5: 76. 1955.


Stems 10–20(–30) cm tall. Lower leaves spatulate or oblong-spatulate, densely to sparsely villous or subglabrous, sometimes ± glandular. Capitula 3–3.5 cm in diam. Phyllaries subequal, 1.5–2 mm wide, apex obtuse or rounded.


蛇岩高山紫菀 *she yan gao shan zi wan*


Stems 10–20(–35) cm tall. Lower leaves linear-oblong, 3–10 × 0.2–0.5 cm, densely pubescent or densely villous, sometimes ± glandular. Capitula 3.5–5.5 cm in diam. Phyllaries subequal, linear, 1–1.5 mm wide, apex obtuse or rounded.

2300–2500 m. N and W Xinjiang [Mongolia, Russia, Tajikistan (Pamirs)].


空秆高山紫菀 *kong gan gao shan zi wan*


Stems 10–20(–30) cm tall. Lower leaves spatulate or oblong-spatulate, densely to sparsely villous or subglabrous, sometimes ± glandular. Capitula 3–3.5 cm in diam. Phyllaries subequal, 1.5–2 mm wide, apex obtuse or rounded.


异苞高山紫菀 *yi bao gao shan zi wan*


石生紫菀 shi sheng zi wan

*Aster tricapitatus* Vaniot; *A. vaniotii* H. Léveillé.

Herbs, perennial, 20–60 cm, caespitose; rhizomes procumbent or ascending; new rosettes sometimes present. Stems erect or ascending, simple, leafy, moderately to densely strigose and villousulous. Leaves basal and cauline; cauleine leaves gradually reduced upward, sparsely or densely hispidulous, eglandular, or sometimes sparsely minutely stipitate glandular, 3-ribbed, main veins abaxially prominent; basal leaves withered by anthesis, long winged petiolate, narrowly spatulate to obovate or oblanceolate, 2.5–8 × 0.5–1.5 cm, base attenuate, margin shallowly serrate distally, apex rounded or obtuse to acute; lower cauline leaves often marcescent, winged petiolate; blade lanceolate, base attenuate; middle and upper leaves erect; blade oblong to lanceolate, base attenuate, subclasping, margin serrate distally or entire, apex rounded to obtuse, mucronulate. Capitula 2–30 in terminal corymbiform synflorescences, sometimes terminal, solitary, 2.5–3.5 cm in diam.; peduncles 2–10 cm or more, densely strigillose and villosulous, sparsely to moderately minutely stipitate glandular; bracts linear-oblong or linear-lanceolate. Involucres hemispheric, 0.6–0.7(–0.8) × 1–1.2 cm; phyllaries 3-seriate, subequal, abaxially moderately strigillose, sparsely to moderately minutely stipitate glandular proximally; outer phyllaries oblanceolate, sometimes spatulate, 5–7 × 1.3–2 mm, leaflike, margin narrowly scarious, ciliate, mid-vein brownish, translucent, apex rounded or acute, sometimes purplish; inner phyllaries lancelolate, leaflike distally, purplish distally, margin ciliate, apex obtuse or acute. Ray florets 21–34, blue-purple to pink or pinkish white, tube glabrous, lamina 11–17 × 1–2 mm, glabrous, eglandular; disk florets yellow, 4–5 mm, tube ca. 1.7 mm, limb funnelform, 3–3.5 mm, glabrous, minutely stipitate glandular proximally, lobes spreading, triangular, equal, 0.7–1 mm. Achenes broadly obovoid, compressed, ca. 2 mm, densely strigillose, eglandular, margin 2-ribbed, densely strigillose-ciliate. Pappus 4-seriate, dirty white, barbellate throughout, sometimes outermost bristles few, slender, 0.5–0.7 mm; outer bristles few, slender, 2–3 mm; inner bristles 3.5–4 mm, acute; innermost bristles 4–4.5 mm, weakly clavate. Fl. and fr. Aug.–Oct.

- Alpine and subalpine forest margins, grasslands, pastures, open slopes, roadsides; 2000–4000 m. SW Sichuan, Xizang, N and NW Yunnan.

The flowering capitula of *Aster oreophilus* are used medicinally to alleviate pain and as an antiphlogistic.


异苞紫菀 yi bao zi wan

Herbs perennial, 8–20 cm tall; ± caespitose; rhizomes thickened. Stems erect, simple, moderately strigillose, sparsely minutely stipitate glandular. Leaves basal and cauline; basal leaves rosetulate, cauline leaves gradually reduced upward, densely hairy, sparsely or moderately minutely stipitate glandular, rarely eglandular; basal leaves present at anthesis, ascending, narrowly winged petiolate (petiole 0.9–4 cm); blade abaxially paler, ovate to broadly obovate or spatulate, 0.7–2 × 0.5–1.4(–1.9) cm, base attenuate, midvein conspicuous, margin entire or sparsely serrate, apex rounded to obtuse, mucronulate; calyx leaves petiolate, few; blade ovate to lanceolate, 2–3 cm, base attenuate to cuneate, margin serrate, apex obtuse to acute; uppermost leaves sessile, narrowly obovate to lanceolate, 2–2.5 cm, serrate. Capitula solitary or 2–5 in terminal corymbiform synflorescences, 3–3.5 cm in diam.; peduncles slender, 2–6 cm; bract 1 or absent, linear-oblancoceolate, densely strigillose, eglandular. Involucres hemispheric, 0.7–1 × 1.5–1.7 cm; phyllaries 3-seriate, subequal, densely strigillose, adaxially strigillose at apex; outer phyllaries oblong to lanceolate, 6–9 × 1–2 mm, leaflike, margin narrowly scarious, ciliate, apex obtuse to acute, tinged reddish purple; inner phyllaries linear-lanceolate, 6–9 × 1–1.2, ± leaflike distally, margin scarious, ciliate, distally acute. Ray florets 13–22, white, tube minutely hairy, minutely stipitate glandular, lamina ca. 7 × 2 mm, glabrous, eglandular; disk florets yellow, 3.5–4 mm, tube and proximal limb sparsely to moderately hairy, eglandular, limb funnelform, 2.5–2.8 mm, lobes spreading, triangular, unequal, 1–1.5 mm. Achenes narrowly obovoid, ± compressed, 3–4 mm, 2-ribbed, moderately to densely strigillose, densely mi-
nutely stipitate glandular. Pappus 4-seriate (unclearly), dirty white, bristles barbellate throughout; outermost bristles few, slender, ca. 1 mm; outer bristles few, slender, 2–2.5 mm; inner bristles ca. 3 mm, acute; innermost bristles 3.5–4.5 mm, weakly clavate. Fl. Jul.–Sep. 2n = 18*.

- Among exposed rocks on slopes, alpine regions; 3400–3700 m, Taiwan.


髯毛紫菀 ran mao zhi wan

Herbs, perennial, 20–40 cm tall; rhizomes stout, stoloniferous. Stems erect, simple, sparsely or moderately hirsute, with sessile glands above, with marcescent leaf remains at base. Leaves basal and cauline, cauline leaves reduced upward, densely to moderately strigose, simple, triplinerved, veins inconspicuous; basal leaves usually persistent, narrowly lanceolate, densely strigillose-ciliate, apex obtuse or rounded; middle leaves oblong to oblanceolate, ca. 2.5 × 0.6–1 cm, base attenuate, margin entire or sparsely serrulate, densely strigose-ciliate, apex obtuse or rounded; middle leaves oblong to oblanceolate, 2–3.5 × 0.4–0.7 cm, base subclasping; upper leaves small, apex acute. Capitula terminal, solitary, 4–5 cm in diam. Involucres hemispheric, 0.6–0.7 × 1.5–1.7(–2) cm; phyllaries 3-seriate, spatulate-oblong to oblong or linear, 9–10 × 1.5–2.5 mm, abaxially sparsely strigose, leaflike, margin strigillose-ciliate, inner phyllaries with margin scarious, erose-fimbriate, purplish, apex acute or obtuse, purplish. Ray florets 30–40, blue or purplish, tube 2–2.2 mm, hairy; disk florets yellow, 3.5–5.5 mm, tube ca. 1.3 mm, distal tube and limb base hairy, limb narrowly funnelform, lobes lanceolate, 1.2–1.5 mm, often purple. Achenes brown, obvoid, compressed, ca. 3 mm, densely strigose, sparsely glandular apically, 2-ribbed. Pappus reddish or buff, 3-seriate, bristles barbellate above; outermost bristles ca. 0.9 mm; inner bristles ca. 4.7 mm, acute; innermost bristles 5.1–5.5 mm (reaching base of disk corolla lobes), ± clavate. Fl. Jul.–Aug.

Open grassy slopes, field margins, sometimes among dwarf shrubs; 3000–4000 m, S Xizang [Bhutan, India (Sikkim), Nepal].


舌叶紫菀 she ye zhi wan

Herbs, perennial, 35–40 cm tall; rhizomes stout, somewhat woody. Stems erect, thick, shallowly canaliculate, simple, base with marcescent leaf remains, hirsute-villous, short-stipitate glandular. Leaves basal and cauline; cauline leaves sparse, densely hirsute-villous, often short-stipitate glandular, ± thick, margin entire, midvein abaxially prominent, 3-veined, veins subparallel; basal and lower cauline leaves crowded, winged petiole; blade oblance-spathulate to oblanceolate, 4–6.5 × 0.6–1.2 cm, base attenuate, apex rounded or obtuse, rarely ± acute; middle leaves oblong to lanceolate, 3–5 × 0.6–0.8 cm, base often cuneate or subrounded, subclasping; upper leaves small, lanceolate to linear, apex acute. Capitula terminal, solitary, 4.5–5.5 cm in diam. Involucres not described; phyllaries 3-seriate, equal, purple tipped, oblong or oblanceolate, 9–10 × ca. 2 mm, abaxially densely hirsute-villous, margin ciliate; outer phyllaries leaflike, apex obtuse or rounded; inner phyllaries with margin scariose, erose, apex acute. Ray floret 30–40, blue-purple, tube 1.1–2 mm, lamina 15–20 mm; disk florets yellow, 5–7 mm, tube 1.1–1.4 mm, tube and limb hairy, limb funnelform, lobes lanceolate, 1.1–1.5 mm, glabrous, often purple. Achenes (immature) ca. 2.5 mm, strigillose. Pappus 3-seriate, reddish; outer bristles slender, ca. 1 mm; inner bristles ca. 4 mm, acute; innermost bristles 4.5–5.5 mm, clavate. Fl. Jul.

- Alpine open slopes; 3100–3800 m, S Xizang (Yadong).


舌叶紫菀 she ye zhi wan

Herbs, perennial, 15(–)30–45 cm tall; rhizomes procumbent or ascending, stout. Stems erect or ascending, simple, leafy, moderately strigose and villulosulous, eglandular. Leaves basal and cauline; cauline leaves leaves slightly reduced upward, both surfaces scabrous, abaxially sparsely to moderately minutely stipitate glandular, adaxially eglandular, thin; basal leaves withered at anthesis, ascending, narrowly winged petiole (petiole to 7 cm); blade oblanceolate or spatulate, 0.5–7 × 0.4–2.3 cm, base attenuate, margin serrate, apex obtuse to acute; lower cauline leaves withered or persistent at anthesis; cauline leaves petiole to sessile, oblanceolate to lanceolate, 4–7 × 0.8–1.3 cm, base attenuate, often semiamplexicaul, margin serrate or entire, apex obtuse or rounded to acute; uppermost leaves erect or ± spreading, lanceolate to narrowly lanceolate, 2–5 × 0.5–1.5 cm, base amplexicaul, margin slightly sinuate, entire, sometimes few serrate, apex obtuse or rounded. Capitula 2–5 in terminal corymbose synflorescences, rarely solitary, 2–3 cm in diam.; peduncles 1–3 cm; bract 1 or absent, linear-lanceolate, densely strigillose and villulosulous, eglandular. Involucres hemispheric, 0.7–1.2 cm in diam.; phyllaries 3-seriate, subequal, middle area green, 7–8 × 1–1.5 mm, densely pilose, ± leaflike, margin scarious, slightly erose, sparsely ciliate, midvein inconspicuous, apex acute, dark purple, ciliate; outer phyllaries oblong; inner phyllaries lanceolate. Ray florets 22–28, blue-purple, tube glabrous, eglandular, lamina 15–18 × 2.2–2.5 mm, glabrous, eglandular; disk florets yellow, 5–6 × 3.5–4.5 mm, proximally sparsely hairy, lobes spreading, triangular, 1.2–2 mm. Achenes broadly obvoid, ± compressed, ca. 3 × 2 mm, moderately strigillose, sparsely minutely stipitate glandular distally, margin densely strigillose-ciliate, 2-ribbed. Pappus 4-seriate, straw-colored or sometimes purplish, bristles barbellate throughout; outermost bristles few, slender, ca. 1 mm; outer bristles few, slender, 2–2.5 mm; inner bristles 4–4.5 mm, acute; innermost bristles ca. 5 mm, ± clavate. Fl. Aug.–Oct.

- Alpine or subalpine grassy slopes; 2600–3600 m, W Sichuan, NW Yunnan.

87. Aster tricephalus C. B. Clarke, Compos. Ind. 43. 1876.

三头紫菀 san tou zhi wan

Herbs, perennial, 30–40 cm tall, rhizomatous, often with robust stolons bearing rosettes. Stems erect, simple below, sparsely pilose. Leaves basal and cauline, pilose, glandular, basal leaves (flowering stems) absent or withered by anthesis; blade spatulate, ca. 6.5 × 2 cm; cauline leaves ± evenly distributed...
and similar in size, usually overlapping, sessile, oblongolate, elliptic, or lanceolate, 3.5–6.5 × 0.6–2.1 cm, base subclasping, margin entire or 2- or 3-serrulate, apex obtuse or acute; upper leaves often surrounding capitula. Capitula 1–3 (rarely), 2–2.8 cm in diam. Involucres not described; phyllaries 1- or 2-seriate, leaflike, oblongolate, 12–14 × 2–3 mm, glabrate, mid-vein brownish, ciliate, apex acute or obtuse. Ray florets 50–60, white or blue, tube ca. 0.2 cm, lamina ca. 18 mm; disk florets yellow, 4.5–5.5 mm, hairy, tube 1.5–2.2 mm, lobes ca. 1.5 mm. Achenes brown, obovoid, 3.4–4 mm, strigillose, apically glandular, 2-ribbed. Pappus whitish or buff, 5–5.5 mm. Fl. Aug–Oct.

Aster trichophalus is similar in height to A. barbellatus and A. neo-elegans but differs in its flowering stems without basal leaves, the basal leaves being present only on well-developed stolons, its capitula usually 3, and its ray florets 50–60.


新雅紫菀 xin ya zi wan

Aster elegans J. D. Hooker & Thomson ex C. B. Clarke, Compos. Ind. 44. 1876, not Willdenow (1803), nor Nees (1818), nor (Nuttall) Torrey & A. Gray (1841).

Herbs, perennial, 40–75(–100) cm tall, rhizomatous, stoloniferous. Stems simple, strigillose. Leaves strigillose, margin entire, scabrous; basal leaves persistent, winged petiolar, oblongolate to spatulate, 5–7 × 0.8–1 cm, base attenuate, apex rounded; cauline leaves gradually reduced upward, sessile or broadly winged shortly peltate; blade oblong to oblongolate, base cuneate, subclasping, apex acute or obtuse; upper leaves remote, sessile, linear, apex acute. Capitula 3–6 in open corymbose synflorescences, 2–2.5 cm in diam. Phyllaries 3-seriate, oblong, 4–8 × 1–1.5 mm, abaxially strigillose, leaflike above, margin narrowly scarious, eros-fimbriate, ± purplish, villous-ciliate (red crosswalls), apex acute, purple-tipped. Ray florets 35–40, white, mauve, or blue-violet, tube ca. 1.5 mm, sparsely hairy, lamina 7–12 mm; disk florets yellow, hairy, ca. 4 mm, tube ca. 1.5 mm, limb funnelform, lobes lanceolate, ca. 1 mm. Achenes light brown, obovoid, compressed, 2.6–3 mm, densely strigillose, margin 2-ribbed (ribs distally reddish brown), strigillose-ciliate (sometimes rib completely strigillose). Pappus 4-seriate, purplish straw-colored, bristles barbellate throughout; outermost bristles few, slender, ca. 0.5 mm; outer bristles slender, ca. 4 mm; inner bristles few, ca. 5 mm, acute; innermost bristles ca. 5.5 mm, slightly clavate. Fl. and fr. Jul–Sep.


东俄洛紫菀 dong e luo zi wan

Aster subcaerulea S. Moore; A. tongolensis f. glabratius Diels; A. tongolensis f. humilis Diels.

Herbs, perennial, 14–47 cm tall, sometimes caespitose; rhizome slender, procumbent or ascending, often with stolons bearing rosettes. Stems erect, simple, somewhat slender, sparsely strigose or strigillose, villous or villosulous, sometimes sparsely minutely stipitate glandular. Leaves basal and cauline; cauline leaves gradually or sometimes abruptly reduced upward, both surfaces scabridulous or hisrate, margin ciliate, 3- veined, veins conspicuous; basal leaves winged petiolar, peti-ole base subclasping; blade spathulate or obovate to oblan-aceolate, 0.5–5 × 0.3–2.3 cm, base attenuate, margin entire or remotely serrate in upper half, apex obtuse to rounded, sometimes acute; lower cauline leaves sessile, oblong to linear-lanceolate, base subclasping; middle and upper cauline leaves 1–5 × 0.1–0.7 cm, apex acute. Capitula terminal, solitary (rarely 2), 3–5(–6.5) cm in diam. Involucres hemispheric, 5–7 mm; phyllaries 2- or 3-seriate, subequal, appressed or often squar-rose, oblong-linear, 5–8 × 0.8–1.5 mm, abaxially villosulous, hardened below, leaflike above, apex acute. Ray florets 30–70, blue or lavender to purplish, tube sparsely hairy, lamina 15–20 × 1–2 mm, glabrous, eglandular; disk florets orange, 3.5–4.5 mm, limb funnelform, 2.5–3 mm, proximally hairy, lobes

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spreading to reflexed, narrowly triangular, 1–1.5 mm, abaxially sparsely hairy. Achenes broadly obovoid, ca. 2 mm, densely strigillose, 2-ribbed (ribs sparsely strigillose, densely so apically). Pappus 4-seriate, purple-brown to brown, of few bristles; outermost bristles slender, 0.2–0.7 mm; outer bristles slender, 0.7–1 mm; inner bristles 1.2–1.6 mm, acute; innermost bristles 1.5–2 mm, slightly to distinctly clavate. Fl. Jun–Aug, fr. Jul–Sep. 2n = 18*.

● Alpine and subalpine open forests, stream banks, grasslands, boggy margins of lakes, rocky or grassy slopes, pastures, shrub thickets, wet places; 2500–4000 m. S Gansu, Qinghai, NW and SW Sichuan, Xizang, NW Yunnan.

*Aster tongolensis* is frequently cultivated as an ornamental.


缘毛紫菀 *yuan mao zi wan*

Herbs, perennial, 2–45 cm tall, sometimes caespitose; rhizomes robust, woody. Stems solitary, erect, simple, finely striate, sparsely to moderately pilose. Leaves basal and cauline, glabrate to sparsely pilosulose (more so toward apex), margin entire, sometimes remotely serrulate, ciliate to ± densely ciliolate, midvein abaxially prominent, pilose; basal leaves present at anthesis, broadly winged petiolate, petiole base subclasping; blade spatulate or obovate to oblanceolate, 0.7–1 mm; inner bristles slender, 0.2–0.7 mm; outer bristles slender, 1–2 mm. Fl. May–Jul, fr. Aug. 2n = 18*.

Alpine *Pinus* forest margins, open alpine coniferous forests, thickets and grasslands on slopes; 2700–4600 m. S Gansu, Qinghai, W Sichuan, Xizang, NW Yunnan [Bhutan, N Myanmar].

*Aster souliei* is sometimes cultivated as an ornamental.

This species is variable in size, leaf shape, involucre, and indumentum. The varieties may represent extremes in a continuum of variation.

1a. Phyllaries abaxially glabrous, margin densely pilose-ciliate or ciliate.

1b. Phyllaries abaxially sparsely or densely pilosulose, margin ciliate

91a. Aster souliei var. souliei

缘毛紫菀 (原变种) *yuan mao zi wan (yuan bian zhong)*

*Aster ganlun* Kitamura.

Phyllaries abaxially glabrous, margin densely pilose-ciliate or ciliate.

W Sichuan, Xizang, NW Yunnan [Bhutan, N Myanmar].


毛背缘毛紫菀 *mao bei yuan mao zi wan*


Phyllaries abaxially hairy, margin densely pilose-ciliate.

S Gansu, W Sichuan, NW Yunnan [Bhutan, N Myanmar].


大花紫菀 *da hua zi wan*

Herbs perennial, 35–45 cm tall; rhizomes robust (to 6 mm in diam.); roots dense, fibrous, bearing rosulate phyllome. Stems single, erect, stout (5–7 mm in diam.), purple-red above, angled and finely canaliculate, hirsute (hairs ca. 4 mm) below, densely leafy below, densely pilose above. Leaves: both surfaces densely pilose, margin hirsute-ciliate, midvein stout, hirsute, abaxially triplinerved, veins prominent, lateral veins fine; basal leaves withered or present at anthesis, broadly winged petiolate; blade oblong-spatulate, 7–12 cm, base attenuate, margin subentire toward middle, apex obtuse or rounded; middle cauline leaves sessile, oblong or oblong-lanceolate, smaller, apex obtuse or acute. Capitula terminal, solitary, ca. 6.5 cm in diam. Involucre hemispheric, ca. 2 cm in diam.; phyllaries 3-seriate, squarrose, oblong or linear-lanceolate, 10 × 1.5–2 mm, abaxially sparsely to densely pilosulose distally or glabrous, base ± hardened, leaflike above, margin scarious, sometimes purplish distally, densely pilose-ciliate or ciliate, midvein glabrous or pilose, apex obtuse to slightly acute. Ray florets 25–55, blue-purple to violet, tube glabrous, lamina 12–25 × 2–3 mm, glabrous, eglandular; disk florets yellow, 3–5 mm, limb funnelform, 2–3 mm, proximally sparsely puberulent, lobes spreading, narrowly triangular, 1–2 mm. Achenes obovoid, ± compressed, 2.5–3 × ca. 1.5 mm, densely strigillose. Pappus (2 or)3-seriate, of few purplish- to reddish brown or brown, sometimes straw-colored bristles; bristles barbellate; outermost bristles fewer, slender, 0.1–0.3 mm; outer bristles 1–1.2 mm; inner bristles 1–2 mm. Fl. May–Jul, fr. Aug. 2n = 18*.

● Slopes; ca. 4000 m. W Sichuan (Zhegu Shan).

*Aster megalanthus* is closely related to *A. tongolensis* but differs by being taller and in having more ray florets with broader laminae and longer disk florets.


梵净山紫菀 *fan jing shan zi wan*

Herbs, perennial, 4–7 cm tall; rhizomes short or long, woody, without stolons, collar clad with marcescent petiole remains, fibrous rooted. Stems slender, erect, simple, finely striate, densely or sparsely white pilose, glandular. Leaves basal and cauline; basal leaves rosulate, present at anthesis, winged petiolate; petiole equaling blade; blade oblong-lanceolate-spatulate or spatulate, 8–15 × 3–5 mm, abaxially pale green, sparsely pilose on veins, adaxially dark green, densely strigose, base cu-
neatly attenuate, margin ciliate, entire, midvein and lateral veins abaxially distinctly prominent, lateral veins 2- or 3-paired, apex rounded, inconspicuously mucronulate; cauleine leaves (3 or 4) or 5, sessile or subsessile, lanceolate, spatulate, or rarely linear-oblong, 5–15 × 2–3 mm, apex obtuse or acuminate. Capitula terminal, solitary. Involucres campanulate, 0.4–0.5 × 0.6–0.8 mm; phyllaries 2- or 3-seriate, subequal, leaflike; outer phyllaries oblong-lanceolate, 1–1.5 mm wide, abaxially densely pilose, apex acuminate or ± acute; inner phyllaries linear or linear-lanceolate, glabrous or apically sparingly puberulent, margin narrowly scarious. Ray florets 11–13(–15), white, tube ca. 2 mm, lamina oblong, 6–7 × ca. 1 mm; disk florets yellow, ca. 3 mm, tube ca. 1 mm, lobes ovate-lanceolate. Achenes oblong, ± compressed, 1.5–2 mm, sparsely strigose. Pappus (?3- or 4-seriate), reddish brown; bristles many, barbellate throughout, ± equaling disk corollas. Fl. Jun–Jul.

- Grasslands on slopes, rocky areas; 2000–2400 m. Guizhou (Fanjing Shan).

No specimens of *Aster fanjingshanicus* were seen by one of us (Brouillet).


秦中紫菀 qin zhong zi wan

Herbs, perennial, 24–40 cm tall; rhizomes slender; stolons present. Stems erect, slender, solitary or fascicled, sparsely strigillose, simple or ± branched. Leaves basal and cauleine, thin, abaxially sparsely scabridulous, veins scabrous, adaxially scabrous, margin midvein ± prominent, lateral veins 3- or 4-paired; basal leaves withered at anthesis; lower cauleine leaves long petiolate; blade oblong-spatulate to oblanceolate, 4–7 × 1–1.3 cm, base attenuate, margin serrate (teeth mucronulate); middle leaves sessile or shortly petiolate; blade oblong or lanceolate, 3–5 × 1(–2) cm, base cuneate, apex acute to acuminate; upper leaves small, lanceolate, base often rounded, subclasping. Capitula terminal, solitary or 2–4, terminal at ends of stem and branches, 2–3 cm in diam. Involucres hemispheric-campanulate, 6–7 × 7–10 mm; phyllaries 3-seriate, base hardened, leaflike above, margin scarious, erose-fimbriate, ± acute; outer phyllaries 3–4 × 1–1.5 mm, abaxially sparsely scabridulous; inner phyllaries ca. 4.5 × 1.5–2 mm. Ray florets 12–20, blue-purple, tube ca. 1 mm, glabrous, lamina 10–15 × 2–2.5 mm; disk florets 2.8–4 mm, tube 1–1.5 mm, glabrous, limb campanulate, enlarged, lobes lanceolate, 0.7–1 mm, recurved. Achenes purple, obovoid, slightly compressed, ± trigonous, 2.5–3 × ca. 1.5 mm, sparsely strigose, 4-ribbed. Pappus (?3- or 4-seriate), reddish brown or yellowish; bristles many, stout, barbellate throughout, 0.9–2 mm. Fl. and fr. Aug–Dec.

- Ravines, open forests; 1800–2600 m. Shaanxi (Huxian, Taibai Shan).


怒江紫菀 nu jiang zi wan

Herbs, perennial, 4–24 cm tall; rhizomes long, slender, sometimes with short stolons. Stems ascending, rarely erect, sparsely to moderately villous, eglandular. Leaves basal and cauline; cauleine leaves reduced upward, sometimes abruptly so, thin, glabrous, eglandular, abaxial veins sparsely pilose, adaxial veins also moderately pilosulous, margin serrate to serrulate or entire (uppermost leaves), midvein abaxially prominent, ciliate, apex mucronate; basal leaves present at anthesis, sometimes marcescent; basal and lower cauleine leaves broadly to narrowly winged petiolate (petiole to 2 cm); blade obovate to oblanceolate, 0.5–4 × 0.3–1.5 cm, base attenuate, apex rounded; cauleine leaves ± erect, sessile, obovate to ovate-lanceolate, 1–2.5 × 0.9–3 cm, base rounded or cuneate, subclasping, apex rounded to acute. Capitula terminal, solitary, often subtended by a leaflike bract, 2–3 cm in diam. Involucres hemispheric, 5–9 mm; phyllaries 2- or 3-seriate, subequal, often squarrose, linear-lanceolate, 8–10 mm, leaflike, margin broadly scarious, erose, ciliate, midvein conspicuous proximally, apex acuminate, purplish distally; outer phyllaries 1–1.8 mm wide, abaxially villous proximally to sparsely to moderately so distally, eglandular; inner phyllaries 0.6–1 mm wide, sparsely villous. Ray florets 11–30, blue to blue-purple, rarely white, tube sparsely hairy apically, lamina 7–12 × 1–2.3 mm, glabrous, eglandular; disk florets yellow, 4.5–5.5 mm, limb funnelform, 3–3.5 mm, glabrous, lobes spreading, narrowly triangular, 1–1.3 mm, often tinged purple-brown, glabrate. Achenes brown, narrowly obovoid, compressed, ca. 4 mm, strigose distally, eglandular, 3- or 4-ribbed. Pappus 4-seriate, straw-colored to brownish, with few bristles barbellate throughout; outermost series of slender bristles or narrow scales 0.7–1 mm; outer series of slender bristles, 2–3.5 mm; inner bristles 3–5.4 mm, acute; innermost bristles 4–4.5(–5) mm, weakly clavate. Fl. Jul–Sep, fr. Aug–Oct.

Alpine meadows on slopes or on rocks, openings in *Rhododenron*-bamboo thickets; 3300–4600 m. SW Sichuan, E Xizang, NW Yunnan [NE Myanmar].


天全紫菀 tian quan zi wan

Herbs, perennial, 7–18 cm tall; rhizomes robust, without stolons. Stems ascending, simple, slender, sparingly villous, often glabrescent below. Leaves crowded below and scattered above, glabrate, rather thick, margin villous-ciliate, midvein abaxially prominent, lateral veins 2- or 3-paired and obliquely ascending; basal leaves winged petiolate; blade spatulate, 2–7 × 0.5–1.5 cm, base attenuate, margin 2–5-crenate-serrate, apex obtuse or rounded; lower cauline leaves present at anthesis, sessile or slightly winged petiolate, spatulate to oblanceolate, 1–1.5 × ca. 0.3 cm, apically 3-serrate or entire; upper leaves small, oblong or linear, margin entire. Capitula terminal, solitary, 2–2.7 cm. Involucres hemispheric-campanulate, ca. 7 × 6–10 mm; phyllaries 3-seriate, subequal, or outer phyllaries somewhat shorter, linear-lanceolate or linear-oblongate, 6–7.2 × ca. 1 mm, abaxially glabrous or sparsely villous, membranous, margin villous-ciliate, margin of inner phyllaries ± broadly scarious, erose-fimbriate, apex acute to acuminate, ± leaflike, purplish. Ray florets 13–17, white, tube ca. 1.5 mm, hairy, lamina 10–11 × ca. 2 mm; disk florets ca. 4.5 mm, tube 1–1.2 mm, hairy, limb funnelform, glabrous, lobes lanceolate, ca. 0.8 mm. Achenes (immature) narrowly oblong, ± compressed, ca. 2.5
mm, densely strigose, 2-ribbed. Pappus (immature) 3-seriate, reddish, bristles barbellate throughout; outer bristles short; inner bristles 3.5–4.5 mm. Fl. May–Jul.

- Mountain forest margins and thickets; ca. 3300 m. C and NC Si-chuan (Lixian, Tianquan).

Aster tientschwanensis is similar to A. salvinensis but differs from it by its thick, glabrate leaves, densely strigose achenes, and reddish pappus.

97. Aster himalaicus C. B. Clarke, Compos. Ind. 42. 1876. 须弥紫菀 xu mi zi wan


Herbs, perennial, 8–25 cm tall; rhizomes robust, without stolons, collar clad with marcescent leaf remains. Stems ascending, simple, proximally villosulous, distally sparsely so, minutely stipitate glabulous, more densely so distally. Leaves basal and cauleine, thin, sparsely villosulous, more densely so on veins, moderately to densely minutely stipitate glabulous, margin villos-ciliate, veins abaxially prominent, spicles with purple murco; basal leaves withered at anthesis, marcescent, broadly winged petiole (petiole to 2 cm); blade oblancoate, 0.9–2.5(–4.5) × 0.5–2.5 cm, base attenuate, margin serrulate (teeth mucronate), apex rounded to acute; lower cauleine leaves oblong or obovate to oblancoate, 1.5–4 × 0.5–1.2 cm, base rounded, subclasping, margin entire or dentate to serrulate; upper leaves approaching capitulum. Capitula terminal, solitary, 4–4.5 cm in diam. Involucres hemispheric, 11–13 × 13–14 mm, often overlapping disk; phyllaries 2- or 3-seriate, subequal, apex slightly spreading, oblong-lanceolate to lanceolate, 13–14 × 2.5–3.5 mm, abaxially sparsely villosulous to glabrous, tip densely minutely stipitate glabrous, membranous, margin scarious, ciliate, multiveined, apex acuminate, ?leaflike, purplish. Ray florets 40–50(–70), blue-purple, lamina 12–15(–17) × 0.5–0.7 mm; disk florets purple-brown or yellow, ca. 5 mm, tube and proximal limb hairy, limb funnelform, ca. 4 mm, lobes erect, triangular, ca. 1 mm, tips sparsely minutely stipitate glabrous. Achenes brown, narrowly obovoid, compressed, 2.5–3 mm, strigillose, minutely stipitate glabrous, margin densely so distally, 2-ribbed. Pappus 4-seriate, whitish to straw-colored; outermost series of few tiny scales 0.3–0.5 mm; bristles barbelate throughout; outer bristles slender, 2–3 mm; inner bristles 4–4.5 mm, acute; innermost bristles ca. 5 mm, weakly clavate. Fl. Jul–Aug, fr. Sep–Oct. 2n = 10.

Alpine meadows, Pinus forests; 3600–4800 m. Sichuan, S Xiang, NW Yunnan [Bhutan, India (Sikkim), N Myanmar, Nepal].


Herbs, perennial, 15–25 cm tall; rhizomes procumbent, with several long, slender stolons (to 30 cm) with rosettes. Stems ascending or erect, reddish, sparsely to moderately villosulous, eglandular. Leaves basal and cauleine, sparsely to moderately pilose to glabrate, margin revolute, ciliate, apex obtuse, sometimes acute, mucronulate; basal leaves withered by anthesis, winged petiole (petiole to 6.5 cm); blade spatulate or elliptic, 0.7–3.5 × 0.5–1.3 cm, thick, base attenuate, margin serrate, midvein pronounced; cauline leaves abruptly reduced, few, sessile or (lower leaves) shortly petiolate; blade linear or oblanceolate, 0.5–2.5 × 0.1–0.8 cm, 3-veined, base attenuate, margin entire or 1- or 2-denticulate or -serrate, apex acute or obtuse. Capitula terminal, solitary, ca. 2.5 cm in diam. Involucres hemispheric, 13–18 × 8–12 mm; phyllaries 3-seriate, equal, sometimes squarrose, lanceolate or oblancoate, 8–12 × 1.5–3.5 mm, abaxially glabrous, membranous, shiny, margin scarious, ciliate, purplish, midvein apparent, sometimes strigillose, apex acuminate, purplish. Ray florets 29–42, violet, lamina 15–18 × 1–5 mm, eglandular; disk florets yellow (anther appendages bluish), 4–5 mm, limb funnelform, 2.5–3.5 mm, base sparsely hairy, lobes spreading, triangular, ca. 1 mm. Achenes (imma-

3.5–4 mm; inner bristles 5.5–6 mm, acute; innermost bristles 6–6.5 mm, clavate. Fl. and fr. Jul–Sep.

Rocks near stream sides, among boulders in alpine tundra; 3300–4800 m. S Xizang (Tingri) [Bhutan, India, Nepal].


凹叶紫菀 ao ye zi wan

Herbs, perennial, 2–8 cm tall; rhizomes often vertical, stout, with stolons (to 2–4 cm), collar with marcescent leaf remains. Stems erect, simple, usually purple-brown, sparsely villous at base, more densely so above (hairs with purple cross-walls). Leaves glabrous, tripinerved, with fine 1-paired marginal veins; basal leaves rosulate, present at anthesis, shortly and broadly or narrowly winged petiolate; blade spatulate to oblanceolate, 1–3 × 0.3–0.5 cm, margin entire, ciliate or sparsely ciliate, base gradually attenuate, apex rounded to obtuse, retuse, 3-mucronulate; cauline leaves 3 or 4, oblanceolate, 1–2 × 0.2–0.4 cm, sessile or rarely petiolate. Capitula terminal, solitary, 2–2.5 cm in diam. Involucres hemispheric, ca. 1 cm in diam.; phyllaries 3-seriate, subequal, lanceolate, 6.5–9 × 1.5–2.5 mm, abaxially glabrous, ± leaflike at least above, margin villous-ciliate (purple crosswalls), of inner phyllaries broadly scarious, erose-fimbriate, apex acute or acuminate, recurved, margin and apex purplish. Ray florets 16–25, purplish mauve, tube ca. 2.5 mm, hairy distally, lamina 10–18 × ca. 1.5 mm; disk florets yellow and purplish in distal 1/2, 3.5–6 mm, tube 2–2.5 mm, limb narrowly funnelform, lobes lanceolate, ca. 0.8 mm, ± recurved. Achenes (immature) ovoid, compressed, ca. 2 mm, strigose, 2-ribbed. Pappus 4-seriate, yellowish; outermost bristles 0.5–1 mm; outer bristles slender, ca. 2 mm; inner bristles ca. 4.5 mm, acute; innermost bristles ca. 5.5 mm, clavate. Fr. Jul.–Aug.

- Alpine meadows or on rocks; 4000–4300 m. SE Xizang.

Aster retusus resembles A. batangensis in leaf shape but differs in habit and leaf surface pubescence.


宽苞紫菀 kuan bao zi wan

Herbs, perennial, 5–20(–60) cm tall; rhizomes robust, collar clad by marcescent leaf remains. Stems erect or ascending, ± stout, densely villous (hairs with purple crosswalls), densely leafy. Leaves basal and cauleine, thin, villous (crosswalls yellow in basal leaves, purple in upper leaves), margin sparsely mucronulate, entire in upper leaves, densely villous; basal and lower cauline leaves broadly winged petiolate; blade spatulate or oblanceolate, 2–5 × 0.6–1.7 cm, base attenuate, apex rounded; upper leaves oblanceolate, oblong, lanceolate, or ovate, 1.5–4 × 0.7–1.3 cm, base rounded, apex obtuse to acute, mucronate; uppermost leaves dense, surrounding capitula. Capitula terminal, solitary, 5–6 cm in diam. Involucres 1.5–2.5 cm in diam.; phyllaries 3-seriate, subequal, leaflike, abaxially

sparsely villous, margin sparsely to densely villous-ciliate (purple to brown crosswalls); outer phyllaries ovate to lanceolate, 10–12 × 3–6 mm; inner phyllaries lanceolate to oblong, 2–3 mm wide. Ray florets 25–30, blue or purplish, tube ca. 2.5 mm, lamina 10–20 × 1–2 mm; disk florets yellow, 5.7–7.5 mm, tube 1.8–2.4 mm, distal tube and limb base hairy, limb narrowly funnelform, lobes lanceolate, 1–1.5 mm, tip purple. Achenes pale brown, oblanceolate, compressed, 3–3.2 × ca. 1.5 mm, sparsely strigose, not winged, 2-ribbed. Pappus 3-seriate, yellowish at base, brown distally; bristles barbellate throughout, stout; outermost series of short bristles or scales ca. 0.3 mm; inner bristles 3–4 mm, acute; innermost bristles ca. 5.5 mm, clavate. Fr. Aug.–Oct.

Stone alpine pastures, slopes; 2800–4000 m. NW Yunnan (Dali, Déqên, Gongshan) [N Myanmar].


扁毛紫菀 bian mao zi wan

Herbs, perennial, 15–40 cm tall, sometimes caespitose; rhizome robust. Stems erect or ascending, simple, slender, finely striate, leafy, sparsely to moderately villous, minutely stipitate glandular. Leaves basal and cauleine; cauleine leaves gradually reduced distally, abaxially sparsely pilose, veins villous, sparsely minutely stipitate glandular, adaxially sparsely pilose, veins sparsely villous, margin serrate, ciliate, 3–5-veined, veins abaxially prominent; basal leaves sometimes withered at anthesis, long petiolate (petiole to 8 cm); blade ovate to obovate, 1.5–6 × 0.7–2 cm, apex rounded to obtuse or acute, mucronate; cauleine leaves shortly and broadly winged petiolate or sessile, ovate, 1.5–8 × 0.6–3.5 cm, base attenuate, clasping, apex acute. Capitula solitary, terminal, 7–9 cm in diam. Involucre hemispheric, 2–2.3 cm in diam.; phyllaries 3-seriate, subequal, squarrose to reflexed, lanceolate to linear-lanceolate, 9–10 mm, leaflike, margin villous-ciliate, apex acuminate, tip purplish, proximally white villous, moderately to densely minutely stipitate glandular; outer phyllaries 2–3 mm wide; inner phyllaries ca. 1.5 mm wide. Ray florets 44–51(–100), purplish, tube ca. 1 mm, lamina 20–30 × 1.5–2 mm, glabrous, eglandular; disk florets purplish brown, ca. 5 mm, limb funnelform, ca. 3.5 mm, glabrous, lobes spreading, narrowly triangular, ca. 1 mm. Achenes obovoid, compressed, 3–4 mm, sparsely strigillose, densely so distally, eglandular, not winged, 4-ribbed. Pappus 2-seriate, brown, few; outer series of narrow to broad, erose scales 1–1.5 mm; inner series of stout, flat bristles barbellate throughout, 3–4 mm, long acute. Fl. and fr. Aug.–Sep.

- Alpine or subalpine meadows, streamsides; 2800–4300 m. NW Yunnan.


线舌紫菀 xian she zi wan


Herbs, perennial, 14–45 cm tall, sometimes caespitose; rhizomes robust, sometimes with short stolons. Stems erect or

**Aster bodinieri** H. Léveillé.

Herbs, perennial, 10–50 cm tall, sometimes caespitose; rhizomes robust, woody. Stems erect, simple, densely pilose proximally and apically, sparsely to moderately so at midstem, moderately to densely minutely stipitate glandular, usually regularly leafy. Leaves basal and cauline; cauline leaves slightly and gradually reduced upward, sparsely to moderately pilose or glabrous, veins villous abaxially, margin sparsely shallowly serrate or serrulate, sometimes entire, pilose-ciliate, triplinerved abaxially, veins slightly prominent; basal leaves usually withered at anthesis, long petiolar (petiole to 4 cm); blade spatulate to obovate or oblong-lanceolate, 1–6 × 0.6–3.5 cm, base attenuate, apex acute to obtuse; lower leaves to ovate-lanceolate to oblong, 2–7 × 0.5–3 cm, base rounded or attenuate, subclasping, apex rounded to acute; upper leaves ovate to linear-lanceolate, 1–3.5 × 0.2–1.8 cm. Capitula terminal, solitary, 3–7.5 cm in diam. Involucres hemispheric, 1–2 cm in diam., overtopping the florets; phyllaries 2-3-seriate, subequal, square, squarrose, 10–13 × 1–4 mm, sparsely pilose to glabrate, sometimes inner phyllaries minutely stipitate glandular distally, margin whitish, pilose-ciliate; outer phyllaries linear-lanceolate to oblong, leaflike, apex acute to obtuse; inner phyllaries linear-lanceolate to linear, abaxially hispidulous, margin ± sinuate-crenate, 5–7-veined from base, apex obtuse; main phyllaries usually shorter, narrower. Ray florets 30–60, blue to purple, tube less than ca. 1 mm, lamina 15–35 × 1–3 mm, glabrous, eglandular; disk florets orange becoming reddish, 3.5–5 mm, limb funnelform becoming ± campanulate distally, 2.5–4 mm, glabrous, lobes spreading, narrowly triangular, 0.8–1.5 mm. Achenes obovoid, ± compressed, 2.5–4 mm, glabrous, sparsely minutely stipitate glandular apically, margin winged, 2-ribbed, plus sometimes 2- or 3-ribbed on each side. Pappus series reduced, indistinguishable, sometimes basally fused, purple brown to brown; bristles flattened, barbellate throughout, 1–4 mm, acute. Fl. Jun–Aug, fr. Aug–Oct.

Alpine meadows, mountain slopes, alpine coniferous forests, *Pinius* forests, thickets, pastures; 2500–4900 m. Guizhou, SW Sichuan, N and NW Yunnan [N Myanmar].

*Aster brachytrichus* is difficult to distinguish from *A. jeffreyanus*.

Leaf shape and vestiture and capitula size are variable within the species and have been used as the basis for the varieties recognized in the species. However, there seems to be a continuum in all the features used to partition the variation, and phenotypic plasticity could account for some of it. A thorough morphometric analysis would be needed to determine which varieties deserve recognition. The four varieties recognized are distinguished as follows.

*Aster brachytrichus* var. *temuligulatus* Y. Ling (Fl. Reipubl. Popularis Sin. 74: 360. 1985; 狭舌短毛紫菀 xi she duan mao zi wan; 2600–3500 m. NW Guizhou, SW Sichuan) has oblong leaves densely hispidulous adaxially, with rounded apex, and smaller capitula (3–3.5 cm in diam.), with involucres ca. 1 cm in diam. and ray floret lamina ca. 15 × 1 mm. The other three varieties have leaves adaxially glabrous or sparsely hispidulous and larger capitula (4–7.5 cm in diam.), with involucres 1.5–2 cm in diam. and ray floret lamina 15–35 × 1–3 mm. *Aster brachytrichus* var. *angustisquamus* Y. Ling (Fl. Reipubl. Popularis Sin. 74: 360. 1985; 狭苞短毛紫菀 xia bao duan mao zi wan; ca. 2700 m;
Herbs, perennial, 10–30 cm tall, sometimes caespitose; rhizomes robust, with rosettes. Stems erect, simple, sparsely to densely villous, eglular. Leaves basal and cauline; cauline leaves gradually reduced distally, abaxially sparsely pilose, villous, veins villous, adaxially glabrate proximally to villous apically, eglularand, margin remotely serrulate or entire (upper leaves), villous-ciliate, 3-veined, veins prominent; basal leaves usually present at anthesis, shortly petiolate; blade obovate to oblanceolate, 1.6–4 × 1–1.3 cm, base abruptly attenuate to attenuate, apex obtuse or rounded; middle cauline leaves ± erect, sessile, obovate to linear-lanceolate, base subclasping; upper leaves linear-lanceolate, 1.3–3.5 × 0.1–0.6 cm, base clasping. Capitula terminal, solitary, 3.5–5 cm in diam. Involucres hemispheric, 0.5–0.8 cm in diam.; phyllaries 2- or 3-seriate, subequal, sometimes squarrose, ovate-lanceolate, 7.8–5.2 × 2.5–3 mm, leaflike, margin broadly scarious, remotely erose; outer phyllaries 2.5–3 mm wide, sparsely villous proximally, glabrous distally; inner phyllaries 1.5–2 mm wide, glabrate, margin ciliate, vein sparsely villous. Ray florets 30–50, blue to purple, lamina 15–20 × ca. 2 mm, glabrous, eglularand; disk florets 3.5–4 mm, limb funnelform, ca. 2.5 mm, glabrous, lobes spreading, narrowly triangular, ca. 1 mm. Achenes broadly obovoid, compressed, ca. 2 mm, glabrous, distally striigillose and minutely stipitate glandular, margin winged, wings striigillose-ciliate apically, 4-ribbed. Pappus 2- or 3-seriate, purplish brown, bristles few, barbellate; outermost bristles 0.2–0.5 mm; inner bristles 0.8–1.2 mm, acute; innermost bristles 1.2–1.4 mm, slightly clavate. Fl Jun–Jul.

● Alpine or subalpine open slopes, meadows; 2800–3800 m. Guizhou, SW Sichuan (Muli), NW Yunnan (Lijiang, Zhongdian).


Herbs, perennial, 4–10 cm; rhizomes creeping or ascending, caudices stout, multibranched, sometimes with long, slender stolons bearing rosettes. Stems erect or ascending, simple, densely white lanate, sparsely minutely stipitate glandular, collar with marcescent leaf petioles. Leaves basal and cauline; cauline leaves abruptly reduced, densely white lanate, margin entire; basal leaves present at anthesis, long petiolate (petiole to 2 cm); blade spatulate, 0.6–1.5 × 0.4–0.8 cm, base attenuate, midvein visible, inconspicuously 3-veined, apex rounded to obtuse; middle cauline leaves spatulate, 0.6–0.8 cm; upper cauline leaves linear, often surrounding involucre. Capitula terminal, solitary, ca. 4.5 cm in diam. Involucres broadly campanulate, 12–15 mm; phyllaries 3-seriate, oblong-lanceolate, densely lanate; outer phyllaries sometimes squarrose, 8–12 × 1.5–2 mm, multiveined, apex acuminate, tip purplish; inner phyllaries 10–12 × ca. 1.5 mm. Ray florets 38–40, deep blue, tube and lamina base hairy, eglularand, lamina 10–16–16 × ca. 2 mm; disk florets orange becoming purplish, 6.5–7 mm, limb funnelform, ca. 5 mm, sparsely villouslulos, lobes erect, triangular, ca. 1 mm, lanate. Achenes (immature) narrowly obovoid, compressed, ca. 3 mm, densely striigillose, 4-ribbed. Pappus 4-seriate, straw-colored, sometimes apically reddish, bristles barbellate; outermost series of numerous, white scales 0.7–1 mm; outer bristles slender, 4–5 mm; inner bristles 6–7 mm, acute; innermost bristles 7–8 mm, weakly clavate. Fl Aug–Sep.

Slopes above snowline, stony grounds; 4200–5400 m. Sichuan, S Xizang [Bhutan].


Herbs, perennial, subscapiform. Stems solitary or 2. Basal leaves crowded; cauline leaves few. Capitula terminal, solitary. Involucres broadly campanulate; phyllaries 3-seriate, unequal, ca. 10 mm, densely lanate. Ray florets 20–30, purple, lamina ca. 15 mm; disk florets yellow, limb campanulate, ca. 7 mm, without long hairs. Achenes compressed, 2.5–3 mm, hairy, 2-ribbed. Pappus brownish, numerous, unequal, of barbellate bristles.

● About 5000 m. SW Sichuan (Muli).

The anthers of Aster neolanuginosus are described as having an apiculate base.

Specimens were not seen by us; the description is from the protologue.


Herbs, perennial, 2–15–30 cm tall; rhizomes short; roots tuberoid, near ground surface. Stems erect, solitary, scapiform, purplish or green below, base without marcescent leaf remains, basally densely to distally sparsely villous, densely minutely glandular pubescent. Leaves basal and cauline; cauline leaves abruptly reduced, villous, sparsely minutely stipitate;
glandular, margin entire (basal leaves rarely serrulate), ciliate, 3–5-veined; basal leaves present at anthesis, shortly petiolate, ovate to oblong, 0.5–2 × 0.4–1.3 cm, base rounded to ± attenuate, apex obtuse to acute; middle cauline leaves sessile, oblong to lanceolate, apex obtuse to acuminate; upper leaves subsessile, linear to linear-lanceolate. Capitula terminal, solitary. Involucres hemispheric, 6–9 mm in diam.; phyllaries 2- or 3-seriate, subequal, oblong-lanceolate-oblong to oblong-lanceolate, 5.5–7 × 1–1.5 mm, villous, densely minutely purplish stipitate glandular, more so distally, membranous, margin scarious, densely purplish villos-ciliate, multiveined, apex acuminate, leaflike, tip recurved, purplish. Ray florets 35–60, bluish purple to deep mauve, lamina linear-lanceolate, 10–15 × 1–2 mm; disk florets orange-yellow, 3–3.5 mm, limb funnelform, ca. 2.5 mm, base minutely purple stipitate glandular, lobes erect, triangular, 0.6–0.8 mm, abaxially sparsely hairy, minutely purple stipitate glan-
dular. Achenes narrowly obovoid, ca. 2 mm, strigillose, eglandular, 3–4-ribbed. Pappus 2-seriate, straw-colored; outermost series of few broad scales ca. 1 mm; inner series of sometimes purplish, barbellate bristles 3.5–4 mm. Fl. and fr. Jun–Aug.

Alpine meadows, wet open slopes, valleys, mixed shrubs, marshy places; 3500–4500 m. SW Sichuan, SE Xizang, NW Yunnan [Bhutan].

*Aster likiangensis* is closely related to *A. asteroides* and has been regarded as a subspecies of it by Grierson (Notes Roy. Bot. Gard. Edinburgh 26: 67–163. 1964). It is distinguished by the purple disk floret lobes that are stipitate glandular.


萎软紫菀 wei ruan zi wan

Herbs, perennial, 3–30(–40) cm tall, often scapiform; rhi-
zone long, slender, sometimes stoloniferous. Stems erect, sim-
ple, white (sometimes purple) villous, more densely so upward (sometimes also basally), sparsely to densely minutely stipitate glan-
dular. Leaves basal and cauline; leaves usually sessile, oblong or ob-
long-lanceolate, 1.5–9 × 0.2–1.5 mm, base attenuate to cuneate or ± rounded, usually subclasping; upper cauline leaves long-
lanceolate to lanceolate-linear. Capitula terminal, solitary, 3.5–5–(7) cm in diam.; peduncles sparsely to densely villous, sometimes more densely so below capitula, sparsely to densely glan-
dular. Involucres hemispheric, (1.2–)1.5–2–(3) cm in diam.; phyllaries 2-seriate, subequal, lanceolate, 7–13 × 1–2 mm, abaxially bas-
ally densely white lanate to sparsely white villous, usually less so upward, sparsely to densely minutely stipitate glandular, mar-
gin scarious, sometimes purple tinged, ciliate, membranous, multiveined, apex acuminate, tip sometimes spreading, often densely vil-
loose. Ray florets 31–67, blue or mauve, lavender-blue, rarely pink or pinkish white, lamina linear-lanceolate, 9–
25 × 1–2.5 mm, abaxially proximally hairy (crosswalls purple) or glabrous, eglandular; disk florets orange to yellow, 4.5–7 mm, limb funnelform, 3.5–5 mm, proximally sparsely hairy, lobes erect, triangular, 0.7–1.5 mm. Achenes brownish, nar-
rowly obovoid, compressed, 2.5–3.5 mm, sparsely strigillose, sparsely to moderately (apically) minutely stipitate glandular, rare-
ly glabrous and eglandular, margin strigillose-ciliate, 2-
ribbed, ribs pronounced. Pappus 4-seriate, whitish (sometimes purplish), bristles barbellate; outermost series of narrow scales 0.6–1.5 mm; outer bristles few, slender, 3.5–5 mm; inner bris-
bles 6–6.5 mm, acute; innermost bristles 6.5–7.5 mm, weakly clavate. Fl. and fr. Jun–Nov. 2n = 54.

Damp alpine grasslands, alpine and subalpine pastures, meadows, thickets, screens, fallow fields, forests; 1800–5100 m. S Gansu, N Hebei, E Qinghai, S Shaanxi, Shanxi, W Sichuan, Xinjiang, Xizang, NW Yunnan [Afghanistan, Bhutan, India, Kashmir, Kazakhstan, Mongolia, Nepal, Pakistan, Russia (E Siberia), Uzbekistan; SW Asia (Iran)].
ASTEREAE


全茸紫菀 quan rong zi wan

Herbs, perennial, 4–6 cm tall, caespitose; rhizomes procumbent or ascending, branched, collar clad with marcescent leaf remains. Stems erect, slender, densely white hirsute or villous. Leaves: basal leaves narrowly winged petiolate, base attenuate, apex rounded; middle cauline leaves few, spreading or erect, oblong-lanceolate, 1.7–2.2 × 0.4–0.6 cm, base subclasping, apex somewhat acute; upper leaves linear-lanceolate, acuminate, gray-white thickly tomentose, tripinnervated, veins abaxially somewhat prominent. Capitula solitary, ca. 2.5 cm in diam. Involucre hemispheric, ca. 1.5 cm in diam., thickly gray-white tomentose; phyllaries 2- or 3-seriate, linear-lanceolate, ca. 8 mm, herbaceous, acuminate; outer phyllaries ca. 1 mm wide; inner phyllaries narrower to ca. 0.5 mm wide, with narrowly membranous margin, hairy above. Ray florets ca. 50, lamina (not open) linear-lanceolate, ca. 10 × 1 mm; disk florets yellow, ca. 6 mm, tube ca. 1 mm, puberulent, lobes glandular. Ovary oblong, sparsely pubescent or subglabrous. Pappus 2-seriate, white; outer bristles very short, paleaceous; inner bristles ca. as long as disk corolla.

- Glacier areas; 5300–5400 m. S Xizang (Tingri).

Aster hololachnus is closely related to A. flaccidus, from which it differs mainly in having densely gray-white tomentose leaves and narrower phyllaries and ray florets.


察瓦龙紫菀 cha wa long zi wan


Herbs, perennial, 6–45 cm tall, sometimes caespitose; rhizomes long, slender. Stems erect, simple, striate, purplish brown, moderately to densely purple petiolarly glandular, sparsely leafy. Leaves basal and cauline; cauline leaves gradually reduced upward, thin, villous, sparsely stipeitate glandular, margin remotely serrulate, villous-ciliate, prominently 3-veined, apex acute, tip blunt; basal leaves present at anthesis, long winged petiolate (petiole to 2.5 cm); blade spatulate to ovate or lanceolate, 0.5–5 × 0.2–1.8 cm, base attenuate; lower and middle cauline leaves broadly winged petiolate or sessile, lanceolate, 2.5–9.5 × 0.5–2.3 cm, base attenuate, sometimes subclasping (upward); upper cauline leaves (when present) sessile, linear. Capitula terminal, solitary, 4–6 cm in diam. Involucre broadly hemispheric, 2–3 cm in diam.; phyllaries 2-seriate, subequal, squarrose or spreading, oblong-lanceolate to lanceolate, 6–10 × 1.5–2.5 mm, densely villous (inner phyllaries sparsely so), distally minutely stipeitate glandular, membranous, margin scarious, ciliate distally, multi-veined, apex shortly acuminate, purple. Ray florets 2-seriate, 60–85, bluish purple, tube and basal lamina sparsely hairy, eglandular, lamina linear-lanceolate, 13–15(–20) × 1.6–1.8 mm; disk florets yellow or purplish tinged, 4.5–5.5 mm, limb funnelform, 3–4 mm, lobes erect, triangular, 0.5–0.6 mm. Pappus 4-

*Aster flaccidus* is used medicinally to treat pulmonary abscesses, tuberculosis, and pertussis.

Three forms have been recognized in China: *Aster flaccidus* f. *flaccidus* with leaves ± villous, stem apex and involucre base more densely white villous and inconspicuously glandular, involucres 1.5–2(–3) cm in diam.; *A. flaccidus* f. *glabratus* Y. Ling (Fl. Reipubl. Popularis Sin. 74: 239. 1985; NE Xizang) with leaf surfaces glabrous or sparsely villous on abaxial veins only, margin ciliate or not, involucres 2–2.5 cm in diam., phyllaries to 12 mm, abaxially or on veins villous, eglandular; and *A. flaccidus* f. *griseobarbatus* Grierson (Notes Roy. Bot. Gard. Edinburgh 26: 131. 1964; 3200–4900 m; S and E Xizang, NW Yunnan [Bhutan, NE India]) with upper stems and involucres purplish brown or gray-brown hairy.

1a. Stems 3–15(–40) cm, sparsely glandular; leaf surfaces sparsely to densely villous or at least veins villous; involucres 1.5–2(–3) cm in diam.; outer phyllary base densely lanate or villous, abaxially sparsely glandular. 111a. subsp. *flaccidus*

1b. Stems 3–15 cm, densely glandular upward; leaf surfaces glabrate or abaxial veins sparsely villous; involucres 1.2–1.8 cm in diam.; outer phyllary base sparsely villous, abaxially densely glandular. 111b. subsp. *glandulosus*

111a. Aster flaccidus subsp. flaccidus

[Aster flaccidus subsp. fructuglandulosus (Ostenfeld) Onno; A. flaccidus var. fructuglandulosus Ostenfeld; A. flaccidus f. stolonifer Onno; A. glarearum W. W. Smith & Farrer; A. kansuensis Farrer; A. tibeticus J. D. Hooker; Erigeron flaccidus (Bunge) Botschantzev.]

Stems 3–15(–40) cm, sparsely glandular. Leaf surfaces sparsely to densely villous or at least veins villous. Involucres 1.5–2(–3) cm in diam.; outer phyllary base densely lanate or villous, abaxially sparsely glandular.

Alpine and subalpine pastures, thickets, screes; 1800–5100 m. S Gansu, N Hebei, E Qinghai, S Shaanxi, Shanxi, W Sichuan, NW Xinjiang, Xizang, NW Yunnan [Bhutan, NW India, Kashmir, Kazakhstan, Mongolia, Nepal, Pakistan, Russia (E Siberia), Uzbekistan; SW Asia (Iran)].


腺毛娄软紫菀 xian mao wei ruan zi wan


Stems 3–15 cm, densely glandular upward. Leaf surfaces glabrate or abaxial veins sparsely villous. Involucres 1.2–1.8(–2) cm in diam.; outer phyllary base sparsely villous, abaxially densely glandular.

Damp alpine grasslands; 4000–5000 m. S Xinjiang, S Xizang [NW India, Kashmir].

*Aster flaccidus* is used medicinally to treat pulmonary abscesses, tuberculosis, and pertussis.

Three forms have been recognized in China: *Aster flaccidus* f. *flaccidus* with leaves ± villous, stem apex and involucre base more densely white villous and inconspicuously glandular, involucres 1.5–2(–3) cm in diam.; *A. flaccidus* f. *glabratus* Y. Ling (Fl. Reipubl. Popularis Sin. 74: 239. 1985; NE Xizang) with leaf surfaces glabrous or sparsely villous on abaxial veins only, margin ciliate or not, involucres 2–2.5 cm in diam., phyllaries to 12 mm, abaxially or on veins villous, eglandular; and *A. flaccidus* f. *griseobarbatus* Grierson (Notes Roy. Bot. Gard. Edinburgh 26: 131. 1964; 3200–4900 m; S and E Xizang, NW Yunnan [Bhutan, NE India]) with upper stems and involucres purplish brown or gray-brown hairy.

1a. Stems 3–15(–40) cm, sparsely glandular; leaf surfaces sparsely to densely villous or at least veins villous; involucres 1.5–2(–3) cm in diam.; outer phyllary base densely lanate or villous, abaxially sparsely glandular. 111a. subsp. *flaccidus*

1b. Stems 3–15 cm, densely glandular upward; leaf surfaces glabrate or abaxial veins sparsely villous; involucres 1.2–1.8 cm in diam.; outer phyllary base sparsely villous, abaxially densely glandular. 111b. subsp. *glandulosus*
seriate, dirty white; outermost series of white, broad scales 0.6–0.8 mm; bristles barbellate; outer bristles few, slender, 3.1–4.5 mm; inner bristles few, 5–6.5 mm, acute; innermost bristles 6–6.5 mm, weakly clavate. Fl. and fr. Jun–Oct.

- Alpine and subalpine meadows, valley slopes, Rhododendron thickets, limestone scree slopes; 2600–4800 m. W Sichuan, SE Xizang, NW Yunnan.

*Aster tsarungensis* is closely related to and usually regarded as a subspecies of *A. flaccida*. However, its densely purplish brown glan-
dular, villous stems and yellow disk florets distinguish it from that species.

114. *Aster diplostephioides* (Candolle) Bentham ex C. B. Clarke, Compos. Ind. 45. 1876.

*重冠紫菀* chong guan zi wan

*Heterochaeta diplostephioides* Candolle, Prodr. 5: 282. 1836; *Aster delavayi* Franchet; *A. diplostephioides* var. *delavayi* (Franchet) Onno; *A. vilmorinii* Franchet, p.p.; *Erigeron delavayi* (Franchet) Botschantzev; *E. diplostephioides* (Candolle) Bo-
tschantzev.

Herbs, perennial, 13–57 cm tall, often caespitose; rhizo-
mes robust, branched; roots long, thick, collar clad with mar-
cescent basal leaf bases. Stems erect, simple, sparsely to mod-
erately villous, sparsely to densely minutely stipitate glandular, leafy or sometimes scapiform. Leaves basal and cauline; caul-
line leaves gradually reduced, thin, sparsely to moderately vil-
loose, or glabrate; ray floret 65–125, pale purple to purple-blue, tube apex and lamina base minutely stipitate glandular, tube 1.6–2 mm, lamina linear, 20–30 × 1–2.5 mm, orange to yellow; apex blackish or brownish purple external, tube and proximal limb hairy, limb narrowly funnelform, 3.5–4 mm, lobes erect, triangular, ca. 1 mm. Achenes narrowly obovoid, 3–4 × 1–1.5 mm, sparsely strigillose, minutely stipitate glandular, more densely so distally, 4–6-ribbed. Pappus 3-seriate, white; outermost series of few white becoming straw-colored, broad scales 0.8–1.2 mm; bristles barbellate; inner bristles 3.5–6 mm, acute; innermost bristles 4–7 mm, weakly clavate. Fl. Jul–Sep, fr. Sep–Dec. 2n = 18.

Alpine and subalpine grasslands, rich or wet alpine meadows, scrub, boggy areas, stream banks, floodplains, seepage areas in coniferous or mixed forests; 2700–4600 m. W Gansu, E Qinghai, SW and W Sichuan, S Xizang, NW Yunnan [Bhutan, India, Kashmir, Nepal, N Pakistan].


*云南紫菀* yun nan zi wan

Herbs, perennial, 30–75 cm tall, often caespitose; rhi-

zomes robust, branched; roots long, thick, collar clad with mar-
cescent leaf bases. Stems erect, simple or branched, sparsely
to sometimes moderately villous, moderately to densely min-
utely stipitate glandular, leafy. Leaves basal and cauline; cau-
line leaves gradually reduced, abaxially sparsely villous or gla-
brous, moderately to densely minutely stipitate glandular, adax-
ially sparsely villosulous or sometimes villous, moderately to
densely minutely stipitate glandular, margin entire or serrate to
serrulate, sparsely to moderately villosulous-ciliate, densely mi-

tutely stipitate glandular, midvein abaxially prominent, veins
conspicuous; basal leaves withered at anthesis; basal and lower
cauline leaves ± broadly winged petiolute (petiole to 6 cm) or

lower leaves sessile; blade ovate to oblong-oblate, (5–)7–18 × 1–4 cm, base attenuate, apex acute to obtuse; middle cauline leaves sessile, lanceolate or oblong to oblate, 5–16 × 0.8–6 cm, base rounded or cordate to auriculate, semianemical, apex acute, sometimes obtuse. Capitula terminal, solitary or 2–9 in lax corymbiform synflorescences, 4–8.5 cm in diam.; peduncles 4–16 cm, sparsely to moderately villous, densely mi-

nutely stipitate glandular. Involucres hemispheric, 1.5–2.5 cm

in diam.; phyllaries 3-seriate, subequal, ovate-lanceolate to lin-

clear-lanceolate, 10–16 × 0.8–4(–5) mm, densely white villous
basally and glabrate above or sparsely villous distally, or

sparsely villous along veins, or glabrate, moderately to densely

minutely purple stipitate glandular, membranous, margin nar-

rowly scarious, erose, purple, distally ciliate, multiveined, apex

acute to acuminate, purple-tipped. Ray florets 65–125, pale pur-
ple to purple-blue, tube apex and lamina base minutely stipitate
glandular, tube 1.6–2 mm, lamina linear, 20–30 × 1–2.5 mm, glabrous; disk florets yellow to orange, 5–5.6 mm, tube 1.8–2 mm, tube apex and base of limb minutely stipitate glandular, limb narrowly funnelform, ca. 3.5 mm, lobes erect, triangular, 1–1.2 mm. Achenes (immature) narrowly obovoid, compressed, 3–4 mm, sparsely strigillose, sparsely minutely stipitate glandular distally, 4-ribbed. Pappus 3-seriate; outermost series of broad scales 1–1.2 mm, white or straw-colored; bristles barbel-

ate; inner bristles acute; innermost bristles ca. 6.5 mm, weakly clavate. Fl. Jul–Sep, fr. Sep–Oct.

- Alpine and subalpine grasslands or meadows, forest margins,
slopes, seepage areas, cutover mixed forests, scrub, pastures; 2300–

4500 m. Gansu, Qinghai, Sichuan, E and S Xizang, Yunnan.

*Aster yunnanensis* is closely related to *A. diplostephioides* but

differs in having usually branched stems, usually broader phyllaries

(rarely somewhat narrow), and disk florets apically yellow, not purple.

Based on variations in width and indumentum of the phyllaries, this

species can be divided into the following varieties. Grierson (Notes

nanensis* var. *angustior* and *A. yunnanensis* var. *labrangensis*.

1a. Phyllaries ovate-lanceolate, 3–4(–5) mm wide, often pubescent

in lower part only; ray floret lamina 1.5–2.5 mm wide ............... 115a. var. *yunnanensis*
15a. Aster yunnanensis var. yunnanensis

云南紫菀 (原变种) yun nan zi wan (yu an bian zhong)

*Aster diplostephoiides* (Candolle) C. B. Clarke var. *yunnanensis* (Franchet) Onno.

Stems 2–8-branched, rarely simple. Leaves: margin entire or serrate, villous, lower cauline leaves 17–18 × 2–4 cm, middle leaves abaxially villous on veins, adaxially sparsely villous, and glandular, base rounded or auriculate. Capitula 5–8.5 cm in diam. Involucres 2–2.5 cm in diam.; phyllaries ovate-lanceolate, 3–4 × 0.5 mm wide, densely villose basally, sparsely villous and purplish glandular above. Ray floret lamina 25–35 × 1.5–2.5 mm.

- Alpine and subalpine grasslands; 2500–4500 m. SW and W Sichuan, NW Yunnan.

15b. Aster yunnanensis var. angustior


狭苞云南紫菀 xia bao yun nan zi wan

*Aster vilmorinii* Franchet; *Erigeron vilmorinii* (Franchet) Botschantzev.

Stems 2–5 branched. Leaf margin serrulate or entire, villous, lower cauline leaves 17–18 × 1.5–2.5 cm, middle leaves somewhat narrow or broader, abaxially villous at least at base, veins villous, adaxially sparsely villous, and glandular, base rounded or auriculate. Capitula 4–6 cm in diam. Involucres 1.5–2 cm in diam.; phyllaries linear-lanceolate, 10–13 × 1–2 mm, villous, glandular. Ray floret lamina 20–25 × 1–1.5 mm. 2n = 18*.

- Alpine and subalpine open slopes and grasslands; 3600–4300 m. S Gansu, E and S Qinghai, W Sichuan, E and S Xizang.

16. Aster setchuenensis


四川紫菀 si chuan zi wan

Herbs, perennial, 20–50 cm tall, sometimes caespitose; rhizomes slender. Stems erect, simple, striate, glabrate, densely minutely reddish stipitate glandular, leafy. Leaves basal and cauline; cauline leaves reduced, thin, abaxially pale green, glabrous, eglandular, adaxially scabrous distally, margin sparsely serrulate, scabrous-ciliate, midvein prominent, apex acuminate, tip rounded; basal leaves withered or present at anthesis, sessile or shortly petiolate, oblanceolate, 3–14.5 × 0.4–1.5 cm; middle cauline leaves sessile, lanceolate, 2.5–6 × 0.4–0.9 cm, base rounded-auriculate, subclasping; upper leaves linear, acute. Capitula terminal, 4–6 in lax corymbose synflorescence, 2–4 cm in diam.; peduncles 1.5–13 cm; bracts linear, densely minutely stipitate glandular. Involucres 8–9 mm; phyllaries 3-seriate, subequal, membranous, apex acute to acuminate, reddish purple; outer phyllaries lanceolate, ca. 6 × 1.5–2 mm, abaxially minutely stipitate glandular; inner phyllaries linear-lanceolate, ca. 7 × 0.9 mm, minutely stipitate glandular distally, margin scarious, erose, purplish distally, ciliate distally. Ray florets 25–40, bluish mauve to purple, tube distally hairy and minutely stipitate glandular, lamina 10–12 × ca. 1.5 mm; disk florets yellow, ca. 6 mm, tube ca. 2 mm, limb funnelform, 4–4.5 mm, proximally hairy, lobes erect, triangular, 0.7–0.8 mm. Achenes narrowly obovoid, 3–4 mm, sparsely to moderately striigillate, minutely stipitate glandular distally, margin 6-ribbed. Pappus 4-seriate, white; outermost series of scales linear, 0.7–1 mm; bristles barbellate; outer bristles few, slender, 2–2.5 mm; inner bristles 5–5.5 mm, acute; innermost bristles 5.7–6 mm, weakly clavate. Fl. Aug–Sep.

- Mountain forests or streamsides, disturbed damp shrublands; 3100–3500 m. NC Sichuan (Barkam, Lixian).

*Aster setchuenensis* is distinguished by its scabrous leaves and capitula in lax corymbose synflorescences.

17. Aster lipskii


青海紫菀 qing hai zi wan

Herbs, perennial, ca. 50 cm tall, rhizomes robust. Stems erect, sparsely short villous. Leaves: basal and lower cauline leaves long petiolate, lanceolate, shortly villous, abaxial midvein densely villous, base attenuate, margin entire, shortly villous-ciliate; upper cauline leaves sessile, base clasping; uppermost leaves small, linear-lanceolate. Capitula terminal, solitary, 5–6 cm in diam. Involucres not visible; phyllaries subequal, (not fully visible) to 1.5 mm wide, abaxially brown stipitate glandular, margin of inner phyllaries scarious, ciliate, apex long acuminate. Ray florets dark purple, ca. 25 mm, tube ca. 2 mm, lamina linear, 10–15 mm; disk florets yellow, ca. 4.4 mm, tube ca. 1.1 mm, upper tube and limb base hairy, lobes lanceolate, ca. 0.7 mm. Achenes (inamature) oblanceolate, compressed, 2-ribbed, strigose. Pappus (immature) whitish, 3-seriate; outermost series of scales 0.5–0.7 mm; inner series of bristles 4.1–4.7 mm, acute; innermost bristles ca. 0.6 mm, ± clavate. Fl. Jul.

- About 3800 m. E Qinghai (near Qinghai Hu).
The type of *Aster lpskii* has not been seen. The original description was based on seeds collected from near Qinghai Hu and cultivated at the Komarov Botanical Gardens. This species differs from *A. diplostephioides* in its narrower phyllaries (to 1.5 mm).


狭苞紫菀 xia bao zi wan


Herbs, perennial, 30–60 cm tall, sometimes caespitose; rhizome long, slender, sometimes adjacent rosettes present, sometimes collar clad in basal marcescent leaves. Stems erect, simple, sparsely to moderately villous, sparsely minutely stipitate glandular, densely so upward, leafy. Leaves basal and cauline, sparsely villous, eglandular, margin entire or sparsely serrulate, villous-ciliate, midvein abaxially prominent; basal leaves absent at anthesis; basal and lower cauline leaves long petiolate (petiole to 7 cm); blade oblong-clavate to narrowly oblanceolate, 1.5–6 (–22) × 0.7–2.3 cm, base attenuate, apex acute; middle cauline leaves linear–lanceolate, 7–13 × 0.7–2 cm, base rounded, subclasping to clasping, apex acuminate; upper leaves linear, 2 × 0.1 cm, apex acute. Capitula terminal, solitary, 5–8 cm in diam. Involucres hemispheric, 2–2.4 cm in diam.; phyllaries 3-seriate, subequal, linear–lanceolate, 10–16 × 1–1.5 mm, often surpassing disk florets, membranous, margin narrowly scarious, erose, ciliate, multiveined, apex acuminate, spreading; upper phyllaries abaxially villous, eglandular; innermost phyllaries colorless, glabrate, tip villous. Ray florets 75–121, purplish blue or lilac, tube distally sparsely minutely stipitate glandular, lamina 17–30 × 1–1.2 mm; disk florets yellow, 6.5–7 mm, tube and proximal limb minutely stipitate glandular, limb narrowly funnelform, ca. 5 mm, sometimes sparsely hairy proximally, lobes erect, triangular, 0.7–1 mm. Achenes narrowly obovoid, 3–4 mm, sparsely to moderately strigillose, eglandular, 4-ribbed. Pappus 4-seriate; outermost series of few white scales 0.3–1 mm; bristles dirty white, barbellate; outer bristles slender, 2–4 mm; inner bristles 5–5.5 mm, acute; innermost bristles 6–8 mm, weakly clavate. Fl. Jul.–Aug, fr. Aug.–Sep.

- Alpine slopes; ca. 3900 m. NW Yunnan (Zhongdian).

According to Onno, *Aster brevis* is distinguished from *A. flaccidus* by its stout rhizomes and roots.

No specimens were seen by us.


重羽紫菀 chong yu zi wan

Herbs, perennial, 2–8 cm tall, sometimes caespitose; rootstock woody, collar densely clad by marcescent leaf remains. Stems 2 or 3 or many, pilose. Leaves white villous; basal leaves dense, rosulate, petiolar, petiole 1–2 cm, base clasping; blade 1–2 cm, bipinnatisect; lobes 3–5 pairs, 5–7 mm, each with 3–8 pairs of secondary segments, 1–3 cm; cauline leaves 3 or 4, similar to but smaller than basal leaves, pinnatisect. Involucres 2.5–3.5 cm in diam.; phyllaries unequal, purplish at tips, villous; outer phyllaries 6–7 × ca. 0.75 mm; inner phyllaries 9–10 × 0.8–1 mm. Ray florets 20–35, pale mauve, tube 2.5–3 mm, lamina 1.3–1.5 × ca. 0.2 cm; disk florets yellow, 5.5–6 mm, tube ca. 1.6 mm, lobes ca. 1 mm. Achenes ca. 1.5 × 0.5 mm. Pappus: outer bristles ca. 1 mm; inner bristles slender. Fl. Jul.

- Rock faces; ca. 3200 m. SE Xizang (Xoka).

Specimens of *Aster bipinnatisectus* were not seen by us; the description is based on the protologue by Grierson.

This species is distinguished from all other species of the genus by its pinnatisect, villous leaves. Rosettes at the base of woody stems are also a distinguishing character.


狗舌草紫菀 gou she cao zi wan

*Aster flaccidus* Bunge f. *tunicatus* Onno.

Herbs, perennial, 16–50 cm tall; rhizomes robust. Stems erect, often single, slender to robust, densely hisurate-villous, densely strigillose below capitula. Leaves: both surfaces densely strigose, abaxial veins densely strigose-villous, thick, midvein slightly prominent, lateral veins 4–6 pairs; basal and lower cauline leaves similar, present at anthesis; basal leaves long winged...
petiolate; lower cauline leaves shortly winged petiolate; blade elliptic or oblong-spatulate, 4–18 × 1.4–4 cm, base attenuate, margin coarsely serrate, apex obtuse or rounded; middle and upper cauline leaves sessile, oblong or lanceolate, 2–6 × 0.3–2 cm, base attenuate or rounded-subclasping, margin serrate or entire, apex acute to rounded. Capitula 2–6 (~8) in corymbiform synflorescences, 2–3 cm in diam.; peduncles 1.5–7 cm; bracts linear to linear-lanceolate. Involucres hemispheric, 1–1.2 × 1–1.5 cm; phyllaries 3-seriate, linear to obovate-oblong, apex obtuse or acute to acuminate; outer phyllaries 7–10 mm, broadly scarious, sparsely strigose-villous; inner phyllaries 10–11 × 2–3.5 mm, glabrous or strigose-villous on midvein and at tip, margin scarious, erose or not. Ray florets phyllaries 10–11 × 2–3.5 mm, glabrous or strigose-villous on mm, margin broadly scarious, sparsely strigose-villous; inner phyllaries 10–11 × 2–3.5 mm, glabrous or strigose-villous on midvein and at tip, margin scarious, erose or not. Ray florets 16–20, purplish, tube 4.8–7.5 mm, hairy, lamina 12–14 × 2–4 mm; disk florets yellow-green, 3–6 mm, tube 1.2–2.5 mm, sparsely hairy, limb funnelform, lobes ovate, ca. 1 mm. Achenes oblong-campanulate, ± compressed, 3–3.5 × ca. 1 mm, strigose, 5-ribbed. Pappus yellowish, 3-seriate, stout, outer bristles ca. 1.2 mm; inner bristles ca. 4.2 mm, acute; innermost bristles ca. 5.5 mm, clavate. Fl. Aug–Sep, fr. Sep–Oct.

- Alpine valleys, coniferous forests, rocky slopes; 2000–3000 m. SW Sichuan, N and NW Yunnan.

Two varieties of Aster senecioides have been recognized. However, upon examination of specimens, the width of the scarious phyllary margin is identical, and phyllary width and ray floret lamina width overlap significantly. Varieties would need a morphometric study before they can be accepted.

122. Aster batangensis

<table>
<thead>
<tr>
<th>Variety</th>
<th>Description</th>
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<tbody>
<tr>
<td>1a.</td>
<td>Leaves sparsely strigillose; phyllaries strigillose, minutely stipitate glandular; stems villosulous; Stems villosulous. Leaves sparsely strigillose. Phyllaries strigillose, basally more so, minutely stipitate glandular.</td>
</tr>
<tr>
<td>1b.</td>
<td>Leaves glabrous or sometimes distally strigillose, veins strigillose; phyllaries glabrous, minutely stipitate glandular; stems sparsely villosulous</td>
</tr>
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</table>

122a. Aster batangensis var. batangensis

巴塘紫菀(原变种) ba tang zi wan (yuan bian zhong)

Stems villosulous. Leaves sparsely strigillose. Phyllaries strigillose, basally more so, minutely stipitate glandular.

- Forest and thicket margins, open grasslands, meadows, pastures, stony or scree slopes, cliff faces, stream banks; 3400–4600 m. SW and W Sichuan, E Xizang, NW Yunnan.

122b. Aster batangensis var. staticifolius (Franchet) Y. Ling, Fl. Reipubl. Popularis Sin. 74: 253. 1985 ["staticifolius"]

匙叶巴塘紫菀 shi ye ba tang zi wan


Stems sparsely villosulous. Leaves glabrous or sometimes distally strigillose, veins strigillose. Phyllaries glabrous, minutely stipitate glandular.

- Forest and thicket margins, open grasslands, meadows, pastures; 2500–4000 m. SW Sichuan, NW Yunnan (Lijiang).

123. Aster rockianus


腾越紫菀 teng yue zi wan

Herbs, perennial, ca. 45 cm tall; rhizomes short, multi-branched. Stems simple, bearing fascicled leaves and lateral stems at ends of branches, canaliculate, appressed shortly hairy, glabrate below, densely leafy. Leaves thin, lower leaves withered at anthesis, basal leaves (non-reproducing rosettes) petiolate, petiole longer than blade; blade lanceolate, 2–4 × ca. 1 cm, veins on both surfaces sparsely shortly hairy, base attenuate, apex acute or rounded, mucronate, margin sparsely serrate (teeth mucronulate); cauline leaves shortly winged petiolate, narrowly lanceolate, 3–8 × 0.4–0.8 cm, apex long acuminate. Capitula numerous in dense corymbiform synflorescences, ca. 10 cm in diam. Involucres broadly campanulate, ca. 1 cm in diam.; phyllaries 2-seriate, linear-lanceolate, 5–7 mm, densely orange, 4.6–5 mm, tube ca. 1.5 mm, limb narrowly funnelform, 3.2–3.5 mm, base sparsely hairy, lobes spreading, triangular, ca. 1 mm, eglandular. Achenes narrowly obvoid, ± compressed, 3.5–4 mm, strigillose, eglandular, margin 3-ribbed. Pappus 4-seriate, white; outermost series of few white scales 0.5–1 mm; bristles barbellate; outer bristles few, slender, 2–3 mm; inner bristles 4–4.5 mm, acute; innermost bristles faintly reddish, 5–5.5 mm, weakly clavate. Fl. May–Sep, fr. Sep–Oct.

- Forest and thicket margins, open grasslands, meadows, pastures, open slopes, stony or scree slopes, cliff faces, stream banks; 2500–4600 m. SW and W Sichuan, E Xizang, NW Yunnan.

匙叶巴塘紫菀 shi ye ba tang zi wan


Stems sparsely villosulous. Leaves glabrous or sometimes distally strigillose, veins strigillose. Phyllaries glabrous, minutely stipitate glandular.

- Open slopes, gravelly cliffs, forest margins, pastures; 2500–4000 m. SW Sichuan, NW Yunnan (Lijiang).
hairy, apex acuminate; outer phyllaries shorter than inner ones, inner phyllaries glabrous below, margin scarious, apex reddish. Ray florets 2-seriate, blue (when dry), lamina oblanceolate, 4–5 × ca. 1 mm; disk florets 4–5 mm. Achenes (immature) obovoid, compressed, strigose, margin thick. Pappus white or brownish, equal, equalling disk corollas.

140. SOLIDAGO Linnaeus, Sp. Pl. 2: 878. 1753.

一枝黄花属 yi zhi huang hua shu
Chen Yi-lin (陈艺玲 Chen Yi-ling); John C. Semple

Herbs, perennial, rarely subshrubs; rhizome short to long or woody caudex. Stems decumbent to ascending or erect. Leaves basal (persistent or not by anthesis) and cauleine, alternate, sessile or petiolate, blade ovate to broadly to narrowly lanceolate. Capitula usually small, radiate, numerous in terminal racemiform, paniculiform, or corymboso-paniculiform synflorescences. Involucre narrow-campanulate to ± cylindric; phyllaries 3–5-seriate, imbricate or subequal, linear-lanceolate, deltate, or oblong, herbaceous, margin scarious, apex rounded to obtuse or acute to attenuate. Receptacles slightly convex, alveolate, naked. Florets fertile; ray florets female, 1-seriate, usually yellow, usually glabrous, apex inconspicuously 2- or 3-denticulate; disk florets bisexual, yellow turning brown with age, tubular, limb expanded or narrow, apex 5-denticulate; anther base obtuse; style branches flattened, appendage lanceolate. Achenes obconic to cylindrical, sometimes ± laterally compressed, glabrous or moderately strigilllose, 8–10-ribbed. Pappus of outer setiform scales rarely present, and 2 series of 25–45 fine, persistent, long, barbellate bristles, mid series 90%–95% length of inner, apically attenuate, inner apically very weakly to moderately clavate.

About 120 species: mainly in North America, a few species in Asia, Europe, and South America; six species (three introduced) in China.

1a. Synflorescence racemiform, long paniculiform, or corymboso-paniculiform, branches erect, inserted around stem, capitula attached around branch; involucr 3.5–9.5(–10) mm; inner (longest) pappus bristles weakly to moderately clavate.

1b. Synflorescence pyramidal, secund, branches usually spreading, curved, capitula attached on upper side of branch; involucr 2.3–4 mm; inner (longest) pappus bristles not obviously clavate.

2a. Phyllaries rounded or obtuse; involucr 4–6 mm; rare, occurs in NE China .............................. 3. S. pacifica

2b. Phyllaries acuminate or acute; involucr 3.5–9.5(–10) mm.

2a. Phyllaries acuminate or acute; involucr 3.5–9.5(–10) mm.

2b. Phyllaries acuminate or acute; involucr 3.5–9.5(–10) mm.

2a. Phyllaries acuminate or acute; involucr 3.5–9.5(–10) mm.

2b. Phyllaries acuminate or acute; involucr 3.5–9.5(–10) mm.

2a. Phyllaries acuminate or acute; involucr 3.5–9.5(–10) mm.

2. S. dahurica


一枝黄花 yi zhi huang hua

Amphirhapis chinensis Schultz Bipontinus; A. leiocarpa Bentham; Solidago cantoniensis Lour.; S. virgarea Linnaeus subsp. Solidago (Bentham) Hultén; S. virgarea var. leiocarpa (Bentham) A. Gray; S. virgarea var. paludosa Honda

Herbs, perennial, woody caudex shortly branched. Stems (5–)35–100 cm tall, erect, usually slender, solitary or rarely fascicled, simple or branched in upper part. Leaves: lower cauline 1–25 (including petiole) × 0.4–3(–4) cm, petiole 2–4 cm or more, with long wings, blade lanceolate to ovate, both surfaces puberulent or adaxially glabrous, upper margin serrate or entire; mid cauline petiole winged, blade elliptic, long elliptic, ovate, or broadly lanceolate, 2–14 × 0.4–2(–2.9) cm, base cuneate-attenuate, upper margin serrate, serrulate, or entire; upper cauline length from widest point to apex 6.5–31.5 mm, mean 14.3 mm. Capitula numerous in terminal, dense or lax racemiform or corystobo-paniculiform synflorescences, branches erect, inserted around stem, capitula attached around branch, rarely lower branches elongated terminating in separate synflorescences. Involucr 3.5–6.2(–7.7) mm; phyllaries 4–6-seriate, lanceolate or narrowly lanceolate, apex acute or acuminate. Ray florets 2–9, lamina 2–5(–6.5) × 0.9–2.8 mm. Achenes 2–3 mm, glabrous to sparsely strigose Pappus bristles 3.1–5.2 mm, inner (longest) weakly to moderately clavate. Fl. and fr. Apr–Nov.

Forests, forest margins, thickets and grasslands on slopes; below 100–2900 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [India, Japan, Korea, Laos, Nepal, Philippines, Vietnam].

This species is used medicinally for promoting hemostasis and for treating a variety of conditions, including snakebites, carbuncles, and furuncles. The leaves and capitula of Solidago decurrens are usually much smaller than those of S. dahurica.

兴安一枝黄花 xing an yi zhi huang hua


Herbs, perennial, woody caudex shortly branched; rhizomes woody, sometimes to 5–10 cm. Stems erect, 36–100 cm tall, simple or inflorescence-branched in upper part, glabrous in lower part, sparsely puberulent in upper part. Leaves: lower cauline petirole usually equaling blade, winged, blade elliptic, long elliptic, or lanceolate, rarely ovate, 7–18 × 2.5–3.5 cm, both surfaces glabrous or sparsely puberulent along veins, base gradually narrowed, decurrent, margin coarsely or finely serrate; mid cauline sessile, blade elliptic, long elliptic, or lanceolate, 5–17 × 1.5–4 cm; upper cauline length from widest point to apex 25–45 mm, mean 34.5 mm. Capitula 10–12 × ca. 10 mm, few to numerous in terminal, dense or lax, long Paniculiform synflorescences to 30 cm, or in racemiform ones 10–12 cm, rarely glomerate, branches erect, inserted around stem, capitula attached around branch. Involucre campanulate, 6–9.5(–10) mm; phyllaries 3–5-seriate, lanceolate, 5–8 mm, outer often not much shorter than inner, margin narrowly scarious, apex acuminate or acute. Ray florets 5–10, yellow, lamina 4.6–6.5 mm; disk florets 4–24, averaging 12, 5–7.3 mm, lobes 1.1–1.5 mm. Achenes angled, 2.5–4 mm, distal 1/3–1/2 sparsely to moderately strigose, proximally glabrous or glabrate. Pappus white, bristles 4.5–6.8 mm, inner (longest) weakly to moderately clavate. Fl. and fr. Jul–Sep.

Forests, forest glades; 300–2100 m. Hebei, Heilongjiang, Jilin, Liaoning, Shanxi, Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Nepal, E and SC Russia, Uzbekistan].

This species has been treated as a variety or subspecies of Solidago virgaurea Linnaeus (Sp. Pl. 2: 880. 1753; 毛果一枝黄花 mao guo yi zhi huang hua). Typical S. virgaurea is native to Europe and SW Asia eastward to India, Nepal, and Pakistan. Its presence in China has not been confirmed, but it may occur in westernmost Xinjiang. It has large capitula similar to those of S. dahurica but has achenes that are very sparsely to densely strigose over the entire surface, not just distally.


钝苞一枝黄花 dun bao yi zhi huang hua

Solidago virgaurea Linnaeus var. coreana Nakai.

Herbs, perennial; rhizomes robust. Stems erect, slender, to 100 cm tall, simple, glabrous, laxly leaved. Leaves elliptic or lanceolate, both surfaces glabrous, or sparsely ciliate, lower cauline narrowly petiolute, upper cauline gradually smaller. Capitula 7–12 mm, numerous, in terminal corymsbs, several corymsbs arranged in racemiform synflorescences to 35 cm, branches erect, inserted around stem, capitula attached around branch. Involucre campanulate, 4–6 mm; phyllaries 3- or 4-seriate, elliptic or oblanceolate, 4–6 mm, rounded or obtuse. Ray florets ca. 5 mm. Achenes ca. 2 mm, glabrous. Pappus inner (longest) bristles weakly to moderately clavate. Fl. and fr. Aug–Oct.

Grasslands on slopes, forests, forest margins; ca. 1600 m. Hebei, Heilongjiang, Jilin, Liaoning [Russia].


多皱一枝黄花 duo zhou yi zhi huang hua

Herbs, perennial; rhizomes creeping, branched. Stems 30–50 cm tall (potentially to 100 cm), erect, simple, green, shortly hisurse. Leaves: lower cauline absent at anthesis, similar to mid or upper ones but larger; mid to upper cauline numerous, lanceolate, 4.5–7 cm, tapering at both ends, margin of lower cauliine sharply serrate, lateral veins multiple, prominent (not trinerved), apex acuminate; upper cauline similar, ± reduced, margin sometimes entire. Capitula very small, in secund, pyramidal, paniculiform synflorescences, branches spreading to curved downward, lower branches longest, capitula borne on one side, sometimes a few lower branches much elongated. Involucre 3–4 mm; phyllaries linear-lanceolate, apex acute to obtuse. Florets golden yellow; ray florets 3–8, lamina 1.6–1.9 mm; disk florets 3–6, 2.9–3.3 mm, lobes 0.8–1.1 mm. Pappus inner (longest) bristles not obviously clavate. Fl. Aug–Sep.

Forest margins. Introduced in Jiangxi [native to E North America].

The Chinese plants belong to Solidago rugosa var. rugosa.


加拿大一枝黄花 jia na da yi zhi huang hua

Herbs, perennial; rhizomes creeping, branched. Stems to 150 cm tall, erect, simple, shortly and softly downy above. Leaves numerous, lanceolate or linear-lanceolate, 5–12 cm, abaxially downy, veins sparsely hairy, adaxially shortly pilose, tapering at both ends, margin of basal sometimes entire, of lower and upper cauline sharply serrate, longitudinal veins 3 (triplinerved), of which 2 lateral veins protrude weakly, apex acuminate. Capitula in paniculiform synflorescences, branches (racemes) curved downward, capitula attached on upper side of branch. Involucre 2.5–3 mm; phyllaries linear-lanceolate, slightly obtuse. Florets golden yellow; ray florets hardly longer than involucre. Pappus inner (longest) bristles not obviously clavate. Fl. Aug–Sep.

Occasionally cultivated in gardens and parks in China, and may possibly become naturalized [native to North America].


高大一枝黄花 gao da yi zhi huang hua

Herbs, perennial; rhizomes creeping, branched. Stems to 250 cm tall, simple, shortly and softly aqua-rose downy. Leaves numerous, lanceolate or linear-lanceolate, 5–12 cm, tapering at both ends, apex acuminate, margin of lower leaves sharply serrate, of basal leaves sometimes entire, of upper leaves entire, with 3 longitudinal veins, of which 2 lateral veins protrude weakly, glabrous or downy abaxially, shortly pilose adaxially. Capitula in paniculiform synflorescences, capitula attached on one side, branches curved downward. Involucre 3–4 mm; phyllaries linear-lanceolate, slightly obtuse. Florets
golden yellow; ray florets hardly longer than involucre. Pappus inner (longest) bristles not obviously clavate. Fl. Aug.–Sep.

Cultivated in China; now widely naturalized as an often abundant weed in disturbed areas. Anhui, Fujian, Hebei, Henan, Hubei, Jiangsu, Jiangxi, Liaoning, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [native to North America; widely introduced elsewhere].

The Chinese plants belong to Solidago altissima var. alitissima. Material from China has often been misidentified as S. canadensis.


飞蓬属 fei peng shu
Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Herbs, perennial, sometimes annual or biennial, or sometimes subshrubs. Leaves alternate, margin entire, serrate, or lobed. Capitula radiate, sometimes disciform or rarely discoid, solitary or several, sometimes numerous, in racemiform, corymbose, or paniculiform synflorescences. Involucre hemispheric to campanulate or turbinate to cylindrical; phyllaries 2–5-seriate, subequal, sometimes outer ones shorter, sometimes ± imbricate, linear-lanceolate to linear, membranous or herbaceous, margin scarios, midvein reddish brown, purplish, or green. Receptacles flat to slightly convex or conic, ± alveolate, naked. Ray florets fertile, rarely absent (discoid capitula) or 12–350, 1–5- or more seriate, inner series lamina reduced and/or elaminate, or all reduced or elaminate (disciform capitula), lamina purple, blue, pink, or white, rarely yellow or orange, usually short and narrow, sometimes ± broad; disk florets bisexual, 3–450, yellow (veins often orange), sometimes white, limb cylindric to narrowly funnelform [rarely campanulate], lobes (4 or)5, deltate; anther base obtuse, apical appendages ovate-lanceolate; style branch tips deltate, obtuse or arcuate. Achenes oblong or oblong-lanceolate to oblance-obovoid, compressed to flattened, glabrous or sparsely to densely strigose or strigilate to sericeous, eglandular, 2(–4)-veined, veins often orange. Pappus persistent or caducous, free or ± basally connate, 1- or 2-seriate, outer series of short setae or scales, inner (longest) bristles not obviously clavate. Fl. Aug.–Sep.

About 65 species: Asia, Europe, North and South America; 27 species (13 endemic) in China.

The sections of Erigeron used here follow Nesom (Lundellia 11: 8–38. 2008), except that the polyphyletic Conyza s.s. is included within the genus, as E. sect. Caenotus and E. sect. Conyza.

Key to sections

1a. Ray florets 1–3-seriate, lamina strap-shaped (sometimes narrowly), usually spreading.

2a. Pappus of ray florets of short scales, without bristles, of disk florets 2-seriate, outer series of short scales, inner of 10–15 bristles; capitula numerous in corymbose synflorescences; herbs annual or biennial; capitula nodding in bud ................................................................. 3. E. sect. Phalacroloma

2b. Pappus of ray and disk florets 2-seriate, outer of short scales or bristles, inner of bristles; capitula 1–5 terminal or from upper branches; herbs perennial, rarely annual or biennial; capitula erect in bud.

3a. Leaves mostly basal, margin entire; capitula solitary ................................................................. 1. E. sect. Erigeron

3b. Leaves mostly cauline (basal withered at anthesis), margin serrate or lobed; capitula 1–5 from upper branches .................................................................................................................... 2. E. sect. Karvinskia

1b. Ray florets 4–5-seriate, sometimes elaminate or lamina filiform, erect.

4a. Ray florets in 2 zones, outer 1–3 series laminate, inner 2 elaminate; achenes 2–2.4 mm; pappus accrescent ................................................................................................................................. 4. E. sect. Trimorpha

4b. Ray florets not in 2 zones, laminate or elaminate; achenes 0.8–2 mm; pappus not accrescent.

5a. Leaf margin entire or sparsely serrate ............................................................................................ 5. E. sect. Caenotus

5b. Leaf margin coarsely serrate or lobed, rarely entire .................................................................... 6. E. sect. Conyza

1. Erigeron sect. Erigeron

飞蓬组 fei peng zu

Herbs, perennial, rarely biennial or subshrubs; rhizome short, erect; caudex simple or shortly branched; herbage strigose to hirsute or villous. Stems simple. Leaves mostly basal, oblanceolate to obovate or spatulate, base not clasp and margin entire. Capitula erect in bud, solitary. Ray florets white or blue, rarely yellow or orange, lamina strap-shaped, erect or spreading, coiling (rarely not coiling). Achenes 1.6–2.8 mm, 2-veined. Pappus 2-seriate, outer of short scales or setae, inner of (7–)10–30 bristles, rarely accrescent.

About 65 species: Asia, Europe, North and South America; 27 species (13 endemic) in China.

1a. Ray floret lamina involute when dry.

2a. Disk floret limb cylindric or cylindric-funnelform, anthers and style branches not exserted from corolla.

3a. Disk floret limb cylindric-funnelform .......................................................................................... 23. E. petiolaris

3b. Disk floret limb cylindric and abruptly lamiate or narrowly cylindric.

4a. Phyllaries exceeding or equaling disk florets, outer series slightly shorter than or equaling inner.
5a. Phyllaries appressed, apex purple, densely villous (some with purple crosswalls) ................................... 24. *E. eriocalyx*
5b. Phyllaries ± loose, green or purplish, densely yellowish villous at base ............................................. 25. *E. lachnocephalus*

4b. Phyllaries longer than disk florets, outer series usually 1/2 as long as inner.
6a. Stems sparsely hirsute; achenes ca. 0.3 mm wide, sparsely strigose ...................................................... 26. *E. lonchophyllus*
6b. Stems ± densely hirsute and strigillose; achenes ca. 0.6 mm wide, strigose ............................................. 27. *E. oreades*

2b. Disk floret corollas narrowly funnelform, anthers and style branches often exserted from disk corolla.
7a. Capitula 0.8–1.5 cm in diam.; ray florets 5–7 mm; phyllaries shorter than to equaling or sometimes slightly exceeding disk florets.
8a. Plants 15–50(–60) cm tall; mid and upper cauline leaves narrowly oblong, apex obtuse or rounded, surfaces eglandular ........................................................................................................... 20. *E. himalajensis*
8b. Plants 5–25 cm tall; mid and upper cauline leaves linear or linear-lanceolate, apex acute or shortly acuminate, surfaces often stipitate glandular.
9a. Stems green, 9–25 cm tall; phyllaries green, sparsely strigillose, densely short-stipitate glandular ............................................................ 21. *E. pseudotenuicaulis*
9b. Stems purple, 5–7 cm tall; phyllaries purple, sparsely hirsute-villous, strigillose, often stipitate glandular at base .......................................................................................................................... 22. *E. purpurascens*

7b. Capitula 1.5–3.2 cm in diam.; ray florets 6.5–13.7 mm; phyllaries exceeding or equaling disk florets.
10a. Phyllaries sparsely to ± densely villous and shortly strigose, ± densely stipitate glandular, outer apex spreading, often squarrose; ray florets purple; lobes of disk florets hairy ................................. 15. *E. patensiquama*
10b. Phyllaries villous to glabrate, strigillose, eglandular, outer appressed; ray florets white or purplish; lobes of disk florets glabrous or hairy at base.
11a. Cauline leaves 3–6, often crowded at base, upper gradually reduced; stems sparsely long villous, strigillose .......................................................................................................................... 19. *E. kunshanensis*
11b. Cauline leaves to numerous, usually slightly reduced upward; stems densely villous, strigillose.
12a. Ray florets white, sometimes pink tinged or purplish; phyllaries green, sometimes purple, sparsely to ± densely villous, shortly scabrous; lobes of disk florets glabrous or hairy at base ................................................. 16. *E. multifolius*
12b. Ray florets purple; phyllaries ± purple, lanate (crosswalls pale yellow or purple); lobes of disk florets glabrous or hairy.
13a. Upper cauline leaves and phyllaries lanate (crosswalls yellow or purple); cauline leaves oblanceolate or oblong-oblanceolate to oblong; lobes of disk florets glabrous ................................................................. 17. *E. porphyrolepis*
13b. Upper cauline leaves and phyllaries villous to lanate (crosswalls purple); cauline leaves elliptic-ovate; lobes of disk florets hairy ........................................... 18. *E. lamuginosus*

1b. Ray floret lamina flat.
14a. Phyllaries distinctly exceeding disk florets; ray florets lilac to lavender or purple, or sometimes white; disk floret lobes yellow.
15a. Capitula 1.2–2.5 cm in diam.
16a. Lower and mid cauline leaf margins entire ................................................................................ 12. *E. latifolius*
16b. Lower and mid cauline leaf margins 3–6-serrate to coarsely serrate above middle ................ 14. *E. kiukiangensis*
15b. Capitula 2.5–4 cm in diam.
17a. Phyllaries hirsute, densely stipitate glandular apically only; capitula 3–4 cm in diam. .......... 11. *E. multiradiatus*
17b. Phyllaries densely stipitate glandular, basally hirsute; capitula 2.5–3 cm in diam. ............... 13. *E. leucoglossus*

14b. Phyllaries shorter than to equaling or slightly longer than disk florets; ray florets blue, purple, lilac, reddish, white, or rarely orange; disk floret lobes yellow or purplish to purple.
18a. Leaves mostly basal .................................................................................................................. 10. *E. breviscapus*
18b. Leaves basal and cauline.
19a. Ray florets orange, sometimes yellow to brick-red .................................................................... 5. *E. aurantiacus*
19b. Ray florets pale purple, blue, lilac, or rarely white.
20a. Capitula 1–2.5 cm in diam.
21a. Phyllaries dark cork-colored, shorter than or almost equaling disk florets, hirsute-villous and stipitate glandular; disk floret lobes yellow .............................................. 1. *E. leioreades*
21b. Phyllaries green or purple to partly purple; longer than or equaling disk florets, villous or scabridulous, eglandular or sparsely glandular; disk floret lobes purplish.
22a. Plants 5–20(–30) cm tall; basal leaf surfaces glabrate; phyllaries ± densely scabridulous; ray florets 6–7 mm, disk florets 3.8–4.2 mm; inner pappus bristles 3–3.5 mm .................................................................................. 8. *E. morrisonensis*
22b. Plants 20–35 cm tall; basal leaf surfaces sparsely villous-strigose, strigillose; phyllaries ± densely villous; ray florets 7–8.5 mm, disk florets 5–5.1 mm; inner pappus bristles 5–6 mm ........................................ 9. E. taipeiensis

20b. Capitula to 4 cm in diam.
23a. Ray florets blue ........................................................................................................ 4. E. vicarius
23b. Ray florets lilac to pale purple, rarely white.
24a. Disk floret lobes purplish ...................................................................................... 7. E. alpicola
24b. Disk floret lobes yellow.
25a. Phyllaries densely villous to lanate, eglandular ............................................. 6. allochrous
25b. Phyllaries villous or strigose and stipitate glandular.
26a. Ray florets 6.5–8(–13) mm; phyllaries hirsute-villous and margin stipitate glandular ......................................................... 2. E. seravschianicus
26b. Ray florets 10–12 mm; phyllaries densely stipitate glandular, sparsely strigose (or not) .......................................................... 3. E. alticus


光山飞蓬 guang shan fei peng

Herbs, perennial, 10–37 cm tall, caespitose; rhizome slender. Stems usually several, erect to ascending, green or reddish, branched or rarely simple, hirsute-villous, strigillose, especially in upper parts, stipitate glandular, densely leathery. Leaves: basal withered or present at anthesis, petiolate, petiole hirsute-villous, blade oblanceolate, 0.7–4.5 × 0.1–0.5 cm, surfaces hirsute-villous or strigillose adaxially only, base attenuate, margin entire, hirsute-villous-ciliate, apex obtuse to acute; mid cauline sessile, blade lanceolate, 0.7–8 × 0.3–1.2 cm, surfaces hirsute-villous, strigillose, especially on upper part, petiole and margin densely stipitate glandular. Stems usually several, erect to ascending, green or reddish, branched or rarely simple, moderately to densely curved hirsute, usually moderately to densely stipitate glandular. Leaves green, margin entire;


泽山飞蓬 ze shan fei peng

Herbs, perennial, 10–37 cm tall; basal leaf surfaces sparsely villous-strigose, strigillose; phyllaries ± densely villous; ray florets 7–8.5 mm, disk florets 5–5.1 mm; inner pappus bristles 5–6 mm ........................................ 9. E. taipeiensis

20b. Capitula to 4 cm in diam.
23a. Ray florets blue ........................................................................................................ 4. E. vicarius
23b. Ray florets lilac to pale purple, rarely white.
24a. Disk floret lobes purplish ...................................................................................... 7. E. alpicola
24b. Disk floret lobes yellow.
25a. Phyllaries densely villous to lanate, eglandular ............................................. 6. allochrous
25b. Phyllaries villous or strigose and stipitate glandular.
26a. Ray florets 6.5–8(–13) mm; phyllaries hirsute-villous and margin stipitate glandular ......................................................... 2. E. seravschianicus
26b. Ray florets 10–12 mm; phyllaries densely stipitate glandular, sparsely strigose (or not) .......................................................... 3. E. alticus


泽山飞蓬 ze shan fei peng

Herbs, perennial, 10–37 cm tall, caespitose; rhizome slender. Stems usually several, rarely solitary, erect to ascending, green or reddish, branched or rarely simple, sometimes glabrate in lower part, strigose, strigillose, especially on upper part, peduncles densely stipitate glandular. Leaves green, margin entire; basal withered at anthesis, petiolate, petiole hirsute-villous, blade oblan- cedolate, 0.7–4 × 0.3–1.2 cm, surfaces hirsute-villous or strigillose adaxially only, base attenuate, margin entire, hirsute-villous-ciliate, apex obtuse to acute; mid cauline sessile, blade lanceolate, 0.7–4.5 × 0.1–0.5 cm, base subclasping, apex acute; upper smaller, stipitate glandular. Capitula 1–6 in corymbiform synflorescences, 18–25 mm in diam. Involute hemispheric: phyllaries linear-lanceolate, 5.5–6 × 0.5–0.7 mm, often shorter than or almost equaling disk florets, apex acute, outer shorter, dark cork-colored, hirsute-villous, stipitate glandular, inner margin scarious. Ray florets lilac, 7–9 mm, tube ca. 2.5 mm, hairy distally, lamina flat; disk florets yellow, 3.5–4 mm, hairy distally, lobes lanceolate, ca. 0.4 mm, glabrous. Achenes tan, oblong, compressed, 2–3 mm, strigose. Pappus 2-seriate, outer bristles short, inner 4.5–5 mm. Fl. Jul–Sep.

Picea forests, alpine meadows; 2100–3400 m. N Xinjiang [Kazakhstan, Uzbekistan].

Subalpine meadows; ca. 2600 m. C Xinjiang [Kazakhstan, Uzbekistan].


阿尔泰飞蓬 a er tai fei peng

Herbs, perennial, 15–50 cm tall, caespitose; rhizome erect or ascending. Stems several, sometimes solitary, erect, green or reddish, branched or rarely simple, sometimes glabrate in lower part, strigose, strigillose, especially on upper part, peduncles densely stipitate glandular. Leaves green, margin entire; basal withered at anthesis, long petiolate, blade oblanceolate or spatulate, 2–16 × 0.4–1.2 cm, base attenuate, apex rounded, mucronate; cauline 0.3–1.3 × 0.5–1 cm, lower winged petiolate, oblanceolate, base subclasping, upper sessile, blade lanceolate, apex acute. Capitula 2–5 in corymbiform synflorescences, or solitary, ca. 1.2 × 2.1–3.7 cm. Involute hemispheric: phyllaries 3-seriate, green, subequal, lanceolate to linear-lanceolate, 6–9 × 0.5–0.75 mm, sparsely strigose (or not), densely stipitate glandular, apex acute, margin of inner scarious. Ray florets lilac, 10–12 mm, tube ca. 2.5 mm, hairy, lamina 0.5–1.2 mm wide, flat; disk florets yellow, 4–4.5 mm, tube 1–1.5 mm, hairy, limb cylindric-funnelform, lobes triangular, ca. 0.5 mm, glabrous. Achenes (immature) ± strigose. Pappus 2-seriate, outer bristles short, inner 3.5–4 mm (immature). Fl. Jun–Aug.

Subalpine meadows, grasslands; ca. 2500 m. N Xinjiang [Kazakhstan, Russia (W Siberia)].


蓝舌飞蓬 lan she fei peng

Herbs, perennial, 25–28 cm tall; rhizome short, branching. Stems several, 1–3 mm in diam. at base, straight or ascending, simple, moderately to densely curved hirsute, usually moderately to densely stipitate glandular. Leaves green, margin entire;
basal petiolate, blade linear-lanceolate, 2–9 × 0.1–1.1 cm, apex acute; cauline 3–12, sessile, blade lanceolate to lanceolate, apex acute; lowermost shortly petiolate, blade 0.7–6 × 0.1–0.6 cm. Capitula solitary, 1.4–1.8 × 2.1–3.8 cm. Involucre hemispheric; phyllaries 3-seriate, subequal, green, or reddish at tip, linear-lanceolate, 7–9 × 1–1.8 cm, densely lanate. Ray florets blue, 10–15 mm, tube 2.3–3.5 mm, hairy upward, lamina linear, 1–1.5 mm wide, flat; disk florets yellow, 4.4–5.5 mm, tube hairy upward. Achenes oblong, flattened, 2.5–3.5 × 0.5–0.6 cm, strigose. Pappus 2-seriate, outer bristles short, inner 4–4.5 mm. Fl. Jul–Sep.

Alpine meadows, stony slopes; 2800–4500 m. Xinjiang [Kazakhstan, Uzbekistan].

No specimen of this species was seen by us.

5. Erigeron aurantiacus Regel, Gartenfl. 289. 1879.

橙花飞蓬

Herbs, perennial, 5–35 cm tall or more, caespitose; rhizome short, branched. Stems several or erect or ascending, simple or rarely branched, green or purplish below, densely villous-hirsute, especially in upper part, strigillose, eglandular. Leaves: surfaces strigose, eglandular, margin entire, strigose; basal rosulate, present at anthesis, long petiolate, blade oblong-oblanco-late or oblanco-late, sometimes obovate or elliptic, 1–16 × 0.4–1.6 cm, base attenuate, apex acute to obtuse; cauline 7–17, subclasping, acute, lower long winged petiolate, blade lanceolate or oblanco-late, mid and upper sessile, blade lanceolate to linear-lanceolate, 0.7–15 × 1.5–1.7 cm. Capitula 13–15 × 23–35(–42) mm, solitary. Involucre hemispheric, 7–9 × 15–22 mm; phyllaries 3-seriate, subequal, green and apically purplish, linear-lanceolate, 7–9 × 0.7–1 mm, slightly exceeding disk florets, leaflike, apex acute or acuminate, densely villous-hirsute, innermost margin narrowly scarious (if at all), erose. Ray florets 3-seriate, orange, sometimes yellow to brick-red, 7.8–12 mm, tube ca. 2.5 mm, sparsely hairy, lamina 1–1.4 mm wide, flat; disk florets yellow, 4–5.5 mm, hairy, tube ca. 0.8 mm, limb narrowly funnelform to cylindric-funnelform, lobes triangular, ca. 0.5 mm. Achenes oblong, compressed, ca. 2 mm, strigose. Pappus 2-seriate, outer bristles ca. 0.5 mm, inner 3.5–6 mm. Fl. Jul–Sep.

Forest margins, alpine meadows; 2100–3400 m. Xinjiang [Kazakhstan, Uzbekistan].


蓬山飞蓬

Herbs, perennial, 10–35 cm tall; rhizomes short, branched. Stems several, sometimes single, erect to ascending, simple, green, striate, 1–2.5 mm in diam. at base, sparsely villous (yellow crosswalls distally), denser in upper part, strigillose, sparsely stipitate glandular, sometimes glabrata. Leaves crowded; basal rosulate, long, narrowly winged petiolate, blade obovate, spatulate, or oblanco-late, 2–10 × 0.3–1.6 cm, surfaces sparsely villous, sometimes glabrata, conspicuously 3-veined, base attenuate, margin entire or sometimes sparsely mucronate, villous-ciliate (yellow crosswalls), apex obtuse; lower cauline shortly petiolate, blade oblanco-late, apex acute, upper sessile, blade lanceolate to linear-lanceolate, 1–4 × 0.1–0.9 cm, apex acute. Capitula solitary, 0.9–1.7 × 2.4 cm. Involucre hemispheric; phyllaries 3-seriate, linear-lanceolate, 6–10 × 0.8–1.6 mm, membranous, acuminate, outer green, somewhat shorter than inner, densely villous. Ray florets 2-seriate, lilac, rarely white, 8–14 × 1–2 mm, tube 2–2.7 mm, hairy, lamina spreading, flat when dry; disk florets yellow, 3.4–5.5 mm, tube 1.2–1.8 mm, hairy from middle onto limb base, limb funnelform, lobes triangular, 0.4–0.6 mm, purplish. Achenes oblanco-late, flattened, sparsely strigose. Pappus 2-seriate, cinnmon, outer bristles short, inner 2.5–4.7 mm. Fl. Jul–Sep.

Alpine lawns or forest margins, riverbanks, lakeshores; 1700–2600 m. Jilin (Changbai Shan) [Japan, Russia (Kamchatka, E Siberia)].


玉山飞蓬

Herbs, perennial, 5–20(–30) cm tall, ± caespitose; rhizome short. Stems single to several, erect to ascending (procumbent), 0.8–1.5 mm in diam. at base, simple or sparsely branched above, branches ascending, sparsely villous-hirsute, moderately to densely strigillose, more densely so upward. Leaves: basal persistent at anthesis, rosulate, long petiolate, blade oblanco-late to narrowly spatulate, 2–6 × 0.2–0.7 cm, surfaces glabrata,
• Alpine meadows, montane coniferous—broad-leaved forests, rocky summits, streambeds, open rocky slopes, mountain ridge grasslands, roadsides, trailsides; 1500–3600 m. Taiwan.


**Taipei fēi peng**

Herbs, perennial, 20–35 cm tall, caespitose; rhizome vertical, ascending, branching. Stems several or solitary, erect, 1–2.5 mm in diam. at base, simple, green, hispid-villous, stipitate glandular below capitula. Leaves green; basal dense, rosulate, long petiolate, blade oblanceolate, (specimen too damaged to provide dimensions), surfaces sparsely villous-striate, strigillose, conspicuously 3-veined, base attenuate, margin entire or 1- or 2- serrulate, villous-ciliate; lower cauleine shortly petiolate, blade oblanceolate, mid and upper sessile, blade lanceolate or linear-lanceolate, 0.8–5 × 0.3–1.4 cm, base ± rounded, subclasping, margin entire, apex acute or acuminate; uppermost with surfaces villous, margin villous-ciliate. Capitula solitary, 10–13 × 20–25 mm. Involucre hemispheric, 7–10 × 15–20 mm; phyllaries 3-seriate, green, apex and midvein pubescent, linear-lanceolate, acuminate, ± densely villous, outer shorter, inner slightly longer than or rarely equaling disk florets, ca. 0.5 mm wide, 1-veined. Ray florets 3-seriate, lilac, 7–8.5 mm, tube ca. 3 mm, hairy, lamina ca. 0.4 mm wide, flat; disk florets yellow, 5–5.1 mm, tube ca. 2.5 mm, hairy, limb narrowly funnelform, lobes triangular, ca. 0.4 mm, pubescent. Achenes tan, narrowly oblong, compressed, 2–2.5 mm, strigose. Pappus 2-seriate, yellowish, outer bristles ca. 0.5 mm, inner 5–6 mm. Fl. Jul.

• Alpine meadows; ca. 3200 m. S Shaanxi (Taibai Shan).


**多舌 fēi peng**


Herbs, perennial, 1–50 cm tall (sometimes less than 1 cm), sometimes ± caespitose; rhizome woody, thick. Stems several or solitary, or less than 1 cm, 1–1.5 mm in diam. at base, erect or ascending, sometimes procumbent, green or rarely purplish, simple or sometimes 2–4 branched, sparsely to densely hisurate, strigillose, sparsely to moderately stipitate glandular, densely distally. Leaves mostly basal, basal rosulate, present at anthesis, winged petiolate, blade oblate to obovate-lanceolate or broadly spatulate, 1.5–4 × 0.5–2.5 cm, surfaces sparsely to densely scabrous-hisurate, sparsely scabridulous, sparsely minutely glandular, sometimes glabrate, ± 3-veined, base ± gradually attenuate, margin entire, hisurate-ciliate, apex obtuse or rounded, mucronate; cauline 2–4, rarely absent, sessile, blade narrowly ovate-lanceolate to narrowly lanceolate, 1.4 × 0.5–1 cm, base subclasping, apex obtuse to acute; upper reduced, linear. Capitula solitary at ends of stems or branches, 1.8–2.8–(3.5) cm in diam. Involucre hemispheric, 0.5–0.8 × 1–1.5 cm; phyllaries 3-seriate, slightly exceeding or equaling disk florets, green or purplish at margin and apex, linear-lanceolate, ca. 8 × 1 mm, membranous, acute to acuminate, outer 3.8–5.6 × 0.6–0.8 mm, abaxially densely to sparsely hisrate, ± densely strigillose, short-stipitate glandular, inner 5.6–7.3 × 0.6–0.85 mm, margin narrowly scarious, erose, sparsely ciliate. Ray florets 3-seriate, blue to purple or white, 9–12 × 0.8–1.1 mm, tube 2–3 mm, sparsely hairy in upper part and onto lamina base, lamina spreading, flat when dry; disk florets yellow, 3.5–4 mm, tube 1.2–1.5 mm, limb funnelform, sparsely hairy, lobes ovate, 0.55–0.6 mm, glabrous, tips sometimes reddish. Achenes narrowly oblong to oblate-lanceolate, flattened, ca. 2.2 mm, densely strigose, often 1-ribbed abaxially. Pappus 2-seriate, brownish, outer bristles ca. 0.4 mm, inner 3.7–4 mm. Fl. Mar.–Oct.

• Mid-elevation mountains, alpine to montane meadows, forest margins, *Pinus* forests, streambeds, grasslands, disturbed slopes, roadsides; 1200–3600 m. Guangxi, Guizhou, Hunan, Sichuan, E and S Xizang, Yunnan.

In addition to the typical variety, three varieties have been recognized. *Erigeron brevissimus* var. *tibeticus* (S Xizang: Qüxü; ca. 3600 m) is a high-elevation, shortly stemmed (sometimes less than 1 cm) morphotype; this extreme may represent phenotypic plasticity at the extreme limit of the species range. *Erigeron brevissimus* var. *albioradiatus* (EC Yunnan: Songming) is a white-rayed form with slender stems. The recently described *E. brevissimus* var. *leucanthus* is another pale-rayed form. Color forms frequently occur in *Erigeron* through a simple mutation within the flavonoid pathway. A biosystematic study of the complex is required to evaluate the value of these varieties.

11. **Erigeron multiradiatus** (Lindley ex Candolle) Bentham ex C. B. Clarke, Compos. Ind. 56. 1876 ["multiradiatum"].

**多舌 fēi peng**

*Stenactis multiradiata* Lindley ex Candolle, Prodr. 5: 299. 1836; *Aster inuloides* D. Don; *A. roylei* Onno; *Erigeron multiradiatus* var. *glabrescens* Y. Ling & Y. L. Chen; *E. multiradiatus* var. *ovatifolius* Y. Ling & Y. L. Chen; *E. multiradiatus* var. *salicifolius* C. C. Chang ex Y. Ling & Y. L. Chen.
Herbs, perennial, 20–60 cm tall; rhizome woody. Stems several or single, 2–4 mm in diam. at base, erect, ascending or procumbent, branched or sometimes simple, puberulous at base, rarely green, sparsely or ± densely hirsute, scabridulous, base sometimes glabrate, long-stipitate glandular. Leaves: basal rosetulate, often withered at anthesis, long winged petiolate, blade oblong-oblongate to oblong-lanceolate, sometimes ovate to ovate-elliptic, (4–)5–15 × 0.6–1.5(–2.6) cm, surfaces scabrous or rarely sparsely long hairy, or rarely glabrate or glabrous, glabrous, 3–5-veined, base attenuate, sometimes broad, margin entire or remotely serrate, hirsute-ciliate, apex acute or obtuse, rarely rounded or acuminate; lower cauleine similar, shortly petiolate, mid sessile, blade ovate-lanceolate to oblong-lanceolate or lanceolate, rarely narrowly lanceolate, 3–(8–)8.5 × 0.6–2.2 cm, base subclasping, margin entire or remotely serrate, apex acute or acuminate, upper sessile, reduced, linear or linear-lanceolate, 1–2 cm, apex acuminate. Capitula usually 2 to several in corymbiform synflorescences, or solitary, 3–4 cm in diam. or more. Involucre hemispheric, 8–10 × 15–20 mm; phyllaries 3-seriate, green, apex or entire surface purplish, linear-lanceolate, distinctly exceeding disk florets, 0.6–1 mm wide, abaxially sparsely to densely hirsute, densely stipitate glandular apically, leaflike (outer and inner), margin stipitate glandular, apex acuminate, outer 5–5.4 mm, innermost 6.8–7.6 mm, membranous, margin not or narrowly scarious and hyaline, long acuminate. Ray florets lilac or lavender to purple, spreading, 8.8–17 × 0.4–1 mm, 2 × as long as involucr, tube 1.5–2 mm, sparsely hairy in upper part to lamina base, lamina ± flat when dry; disk florets yellow, 2.9–4.5 mm, tube 0.7–1.5 mm, sparsely hairy above to limb base, limb narrowly funnelform, 2.1–2.3 mm, lobes ovate, 0.4–0.6 mm, glabrous. Achenes oblong to lanceolate, flattened, ca. 2 mm, sparsely strigose, 1-veined abaxially. Pappus 2-seriate, dirty white or yellowish to brownish, outer bristles short, inner ca. 4 mm. Fl. May–Sep.

Alpine or subalpine meadows, slopes, forest margins, forests, open hillsides; 2300–4600 m. Sichuan, Xizang, Yunnan [Afghanistan, Bhutan, India, Kashmir, Nepal; SW Asia [Iran]].

In addition to the typical variety, three varieties have been recognized in this species. *Erigeron multiradiatus var. ovatifolius* (SW Sichuan: Muli) is characterized by ovate to ovate-elliptic leaves with a rounded-ovate, mucronate apex. *Erigeron multiradiatus var. salicifolius* (NW Yunnan: Weixi; ca. 2900 m, in forests) has thin, narrowly lanceolate, sparsely long hairy leaves with an attenuate, somewhat clasping base and an acute or acuminate apex. These may represent extremes of leaf variation of the species or distinct forms or even the result of phenotypic plasticity in the case of *E. multiradiatus var. salicifolius*, which is found in forests; a morphometric study of the complex would be needed to address this issue. *Erigeron multiradiatus var. glabrescens*, found in alpine meadows of NW Yunnan (Zhongdian; ca. 3200 m), has glabrate or glabrous, entire leaves; other reported features appear to fall within the range of variation of the species.


宽叶飞蓬  kuan ye fei peng

Herbs, perennial, 25–50 cm tall; rhizome short, woody. Stems single, erect or ascending, stout, 3–4 mm in diam. at base, often branched, sparsely to moderately hirsute-villos, strigillos, ± densely stipitate glandular above. Leaves: basal withered or present at anthesis, narrowly winged long petiolate, petiole base clasping, blade oblongate to oblong-lanceolate, 6–9 × 1–1.6 cm, surfaces sparsely hirsute, 3-veined, base attenuate, margin entire, hirsute-ciliate, apex obtuse, mucronate; lower cauleine similar, shortly petiolate, margin entire or with 1–3 fine serrations, mid and upper sessile, blade ovate-elliptic to lanceolate, 2.5–5 × 1–1.8 cm, surfaces abaxially hirsute on veins or glabrate, 3–5-veined, base cuneate, ± subclasping, margin entire, hirsute-ciliate, apex acute, mucronate, uppermost blade narrowly lanceolate to linear-lanceolate, 1–2 × 0.2–0.4 cm, surfaces and margin also distally stipitate glandular, adaxially strigillosse, 1-veined. Capitula 3–7 in corymbiform synflorescences, 2.5–3 cm in diam. Involucre hemispheric, ca. 6 × 12–17 mm; phyllaries 3-seriate, dark green, purplish at apex and margin, lanceolate, ca. 0.3 mm wide, distinctly exceeding disk, abaxially basally hirsute, densely stipitate glandular, apex acuminate, outer ones short, inner 5–6 mm, margin scarious, erose. Ray florets 3-seriate, 10–11 mm, tube 1.5–2 mm, sparsely hairy distally, lamina white, flat and patent, 1–1.2 mm wide; disk florets yellow, ca. 4.2 mm, tube ca. 1.2 mm, sparsely hairy in middle part, limb narrowly funnelform, lobes triangular, 0.4–0.5 mm, purple, glabrous. Achenes (immature) oblong, compressed, ± strigose. Pappus 2-seriate, (immature) outer bristles short, inner ca. 3.8 mm. Fl. Aug.

● Alpine grasslands; ca. 3400 m. Xizang (Gongbo’gyamda).

This description is adapted from the protologue. Only a photograph of a paratype has been seen by the present authors. It is closest to *Erigeron multiradiatus*.  


白舌飞蓬  bai she fei peng

Herbs, perennial, to 35 cm tall; rhizome short, woody. Stems single, erect or ascending, stout, 3–4 mm in diam. at base, often branched, sparsely to moderately hirsute-villos, strigillos, ± densely stipitate glandular above. Leaves: basal withered or present at anthesis, narrowly winged long petiolate, petiole base clasping, blade oblongate to oblong-lanceolate-spatulate, 6–9 × 1–1.6 cm, surfaces sparsely hirsute, 3-veined, base attenuate, margin entire, hirsute-ciliate, apex obtuse, mucronate; lower cauleine similar, shortly petiolate, margin entire or with 1–3 fine serrations, mid and upper sessile, blade ovate-elliptic to lanceolate, 2.5–5 × 1–1.8 cm, surfaces abaxially hirsute on veins or glabrate, 3–5-veined, base cuneate, ± subclasping, margin entire, hirsute-ciliate, apex acute, mucronate, uppermost blade narrowly lanceolate to linear-lanceolate, 1–2 × 0.2–0.4 cm, surfaces and margin also distally stipitate glandular, adaxially strigillosse, 1-veined. Capitula 3–7 in corymbiform synflorescences, 2.5–3 cm in diam. Involucre hemispheric, ca. 6 × 12–17 mm; phyllaries 3-seriate, dark green, purplish at apex and margin, lanceolate, ca. 0.3 mm wide, distinctly exceeding disk, abaxially basally hirsute, densely stipitate glandular, apex acuminate, outer ones short, inner 5–6 mm, margin scarious, erose. Ray florets 3-seriate, 10–11 mm, tube 1.5–2 mm, sparsely hairy distally, lamina white, flat and patent, 1–1.2 mm wide; disk florets yellow, ca. 4.2 mm, tube ca. 1.2 mm, sparsely hairy in middle part, limb narrowly funnelform, lobes triangular, 0.4–0.5 mm, purple, glabrous. Achenes (immature) oblong, compressed, ± strigose. Pappus 2-seriate, (immature) outer bristles short, inner ca. 3.8 mm. Fl. Aug.

● Alpine grasslands; ca. 3400 m. Xizang (Gongbo’gyamda).

**Herbs, perennial, to 55 cm tall, caespitose; rhizome woody. Stems several or solitary, erect or ascending, often branched above, green, strigillose, densely hisrate, especially upper part, densely stipitate glandular in upper part. Leaves: basal crowded, rosulate, withered or present at anthesis, narrowly winged petiole, blade oblanceolate or oblanceolate-spatulate, 4–8 × 0.8–1.2 cm, 3–5-seriate, base attenuate, margin entire or 1- or 2-serulate, strigose-ciliate, apex obtuse, mucronate; lower and mid cauline ± petiolate, blade oblanceolate, 3.5–6 × 0.6–1.5 cm, surfaces strigose, base attenuate to cuneate, margin 3–6-seriate to coarsely serrate above middle, rarely entire, upper gradually reduced, sessile, blade narrowly lanceolate or linear, surfaces strigose, stipitate glandular, 1–3-seriate, base subclasping. Capitula several in corymbiform synflorescences, sometimes solitary, 2.5–2 cm in diam. Involucre hemispheric, 6–8 × 12–15 mm; phyllaries 3-seriate, linear-lanceolate, to 9–10 mm, tube 2–2.5 mm, sparsely hairy, lamina reddish, 3.5–4 mm, hairy, tube ca. 1 mm, limb funnelform, lobes lanceolate, ca. 0.6 mm, glabrous. Achenes (immature) oblong, compressed, ca. 2 × 0.6 mm, densely strigose. Pappus (immature) yellowish, 2-seriate, outer bristles short, inner ca. 3.5 mm. Fl. Jul–Sep.

- Forest margins, alpine or subalpine meadows, grassy slopes, ridges; 2400–4100 m. SW and W Sichuan, Xizang, NE and NW Yunnan.


**Herbs, perennial, (3–)6–25 cm tall; rhizome thick, ca. 10 mm in diam. Stems single or several, erect to ascending, sometimes decumbent, 2–3 mm in diam. at base, simple, rarely branched, densely villose, strigillose, more densely so upward, ± stipitate glandular, densely leafy. Leaves: surfaces villosus-scarious and scabridulous (particularly on veins), margin entire, rarely sparsely serratate; basal often withered at anthesis, blade spatulate to oblanceolate, subequal; cauline numerous, lower petiolate, petiole narrowly winged, blade oblong or oblanceolate-oblong, 3–7 × 0.3–0.7 cm, slightly reduced upward, base attenuate, apex rounded or obtuse, mid and upper sessile, lanceolate or oblong-lanceolate to linear-lanceolate, 2.6–0.5–1 mm, subclasping, apex obtuse or acute. Capitula solitary, or sometimes 2–4 in corymb synflorescences, 2–3 cm in diam. Involucre hemispheric, 0.6–0.8 × 1.5–2.5 cm; phyllaries 3-seriate, equaling or exceeding disk florets, outer slightly shorter (sometimes broad, 1.5–2 mm wide), green, sometimes purplish, abaxially sparsely to ± densely villose (particularly at base), shortly scabrous (particularly along midvein), eglandular, leaflike, inner narrowly oblong, 7–10 × 0.5–1 mm, membranous, margin ± villose-ciliate, apex acuminate, often purplish, innermost margin narrowly scarious. Ray florets 3-seriate, white, sometimes pink tinged or purplish, 8–10 mm, tube 2.5–3 mm, sparsely puberulent above, lamina linear, 0.3–0.6 mm wide, involute when dry, glabrous or sparsely hairy; disk florets yellow, veins orange, (4–)4.6–4.8 mm, tube 2.5–2.9 mm, sparsely hairy above, also sometimes on limb and lobe base, limb narrowly funnelform, lobes ovate, 0.5–0.6 mm, anthers and style branches often exserted from disk corolla. Achenes oblong to oblanceolate, flattened (immature), 2–3 mm, sparsely to ± densely strigillose. Pappus 2-seriate, yellowish, outer bristles 0.2–0.3 mm, inner 3.7–4.7 mm. Fl. Jun–Aug.

- Forest margins, alpine or subalpine meadows, rocky slopes; 2600–4100 m. SE Xizang, NW Yunnan.

Two varieties have been recognized in *Erigeron multifolius* in addition to the typical variety, both from NW Yunnan, *Erigeron multifolius var. pilanthus* (Weick) 3500–3600 m has a hairy disk corolla limb and lobe base, an extension of hairiness from the sparsely hairy tube; more data on this feature in other populations are needed before recognition of the variety is warranted. *Erigeron multifolius var. amplisquamus*, from alpine meadows at 3400–3800 m, has broad outer phyllaries 3-seriate, yellowish, 2-seriate, outer bristles 0.2–0.3 mm, inner 3.7–4.7 mm. Fl. Jun–Aug.

- Forest margins, alpine or subalpine meadows, grassy slopes, ridges; 2400–4100 m. SW and W Sichuan, Xizang, NE and NW Yunnan.
eraly (1.5–2 mm wide) equaling or exceeding the purplish ray florets. This variety may deserve recognition upon further study.


紫苞飞蓬 zi bao fei peng

Herbs, perennial, 10–20 cm tall, caespitose; rhizome robust, woody. Stems numerous or single, erect, 1.5–2 mm in diam. at base, simple, long villous (crosswalls yellow), stipitate glandular below capitula. Leaves: basal rosulate, withered or present at anthesis, narrowly winged petiolar, blade spatulate to oblong-oblancoate, 1.5–3 × 0.5–1 cm, 3-veined, base attenuate, margin entire or 1–3-serrulate, villous-ciliate, apex obtuse, mucronate; cauline 5–7, lower shortly petiolar or subsessile, blade oblong-oblancoate or oblong-oblancoate to oblong, 2–3.5 × 0.3–0.4 cm, surfaces villous, subclasping, uppermost lanate (crosswalls yellow or purple). Capitula solitary, 2–3.2 cm in diam. Involucre hemispheric, 9–20(–25) mm; phyllaries 3- or 4-seriate, purple, appressed, lanceolate, acuminately lanate (crosswalls yellow or purple), stipitate glandular below capitula. Leaves: basal rosulate, withered or present at anthesis, narrowly winged petiolar, blade spatulate to oblong-oblancoate, 1.5–3 × 0.5–1 cm, 3-veined, base attenuate, margin entire or 1–3-serrulate, villous-ciliate, apex obtuse, mucronate; cauline 5–7, lower shortly petiolar or subsessile, blade oblong-oblancoate or oblong-oblancoate to oblong, 2–3.5 × 0.3–0.4 cm, surfaces villous, subclasping, uppermost lanate (crosswalls yellow or purple). Capitula solitary, 2–3 cm in diam. Involucre hemispheric, 9–20(–25) mm; phyllaries 3- or 4-seriate, purple, appressed, lanceolate, acuminately lanate (crosswalls yellow or purple), stipitate glandular, outer 5.5–8.5 mm, mid and inner subeseque, 9–11 mm, often exceeding disk florets. Ray florets 2- or 3-seriate, purple, 6.5–7 mm, tube 2.5–2.8 mm, hairy, lamina ca. 0.3 mm wide; disk florets yellow, 4.5–5 mm, tube 2.1–2.6 mm, tube and limb hairy, limb cylindric-funnelform, lobes triangular, ca. 0.5 mm, purple, glabrous, anthers and style branches often exserted from corolla. Achenes narrowly oblong, flattened, 2–2.5 mm, strigose. Pappus yellowish or brownish, 2-seriate, outer bristles 0.4–0.5 mm, inner ca. 5 mm. Fl. Aug.

- Alpine grasslands on slopes; 3200–4200 m. SE Xizang (Bomi, Zayü).


贡山飞蓬 gong shan fei peng

Herbs, perennial, 10–20 cm tall, caespitose; rhizome woody, rather thick. Stems numerous, rarely 1 or 2, 1–1.5 mm in diam., erect or ascending, purplish, rarely green, simple, sparsely long villous, strigillose. Leaves: basal withered at anthesis, long winged petiolar, petiole villous and villous-ciliate, blade spatulate to oblong-oblancoate, 2–6 × 0.5–1.2 cm, 3-veined, conspicuously reticulate, base attenuate, margin entire, villous-ciliate, apex obtuse to acute; cauline 3–6, often crowded at base, lower and mid sessile, blade lanceolate or linear-lanceolate, 1.3–3.5 × 0.4–0.7 cm, subclasping, apex acute, upper gradually reduced, blade lanceolate to linear-lanceolate, abaxial surface with veins sparsely villous, adaxial villous, strigillose. Capitula solitary, ca. 2 cm in diam. Involucre hemispheric, ca. 8 × 15–20 mm; phyllaries 3-seriate, ± equaling disk florets, purplish or green, appressed, subequal, 1–1.5 mm wide, outer linear-oblancoate, abaxially villous, strigillose, eglandular, reticulate, apex ± acute, inner linear-lanceolate, villous or glabrable, 1–3-veined, margin narrowly scarious, apex acuminate. Ray florets 3-seriate, purplish, 7–8 mm, tube 2–2.5 mm, hairy above, lamina ca. 0.5 mm wide, flat, involute when dry; disk florets yellow, 3.5–4 mm, sparsely hairy, limb cylindric-funnelform, lobes ovate, ca. 0.5 mm, glabrous, purplish, anthers and style branches often exserted from corolla. Achenes tan, narrowly oblong, compressed, 2–2.5 mm, densely strigose, 2-veined. Pappus 2-seriate, brownish, outer bristles ca. 0.6 mm, inner ca. 4 mm. Fl. Aug.–Oct.

- Alpine grasslands on slopes; 3000–3800 m. NW Yunnam (Gongshan).


珠峰飞蓬 zhu feng fei peng

Herbs, perennial, 15–50(–60) cm tall, sometimes caespitose; rhizome woody, simple. Stems single or several, 1.5–2 mm in diam., erect or ascending, purple or green above, branched in middle or upper part, sparsely to moderately hissute-villosous, strigillose, base often glabrable, eglandular. Leaves: surfaces sparsely hirsute-villosous, sparsely strigillose, sometimes glabrable, eglandular; basal rosulate, withered and fallen at anthesis, long petiolar, blade oblaneoate to oblong; cauline relatively numerous, thin, lower narrowly winged shortly petiolar, blade oblaneoate to oblong, 2–3.5 × 0.2–0.4 cm, ± distinctly 3-veined, base attenuate, margin entire, ciliate, apex obtuse or sometimes acute, mid and upper sessile, blade narrowly oblong, 2–5 × 0.2–0.3 cm, base subclasping, margin entire or with 1 or 2 small teeth, ciliate, apex rounded to obtuse, uppermest reduced, linear. Capitula 2 to many in corymbiform

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细茎蓬 xi jing fei peng


Herbs, perennial, 9–25 cm tall; rhizome woody, tortuous or crowded in tuber, collar clad with marcescent petiole bases, simple or branched. Stems slender, 0.6–1.5 mm in diam., erect or ascending, branched in middle or simple, green, sparsely strigose and strigillose, denser in upper part, sometimes glabert below, sometimes short-stipititate glandular in upper part. Leaves: basal rosulate, present at anthesis, narrowly winged long petiolate, blade narrowly oblanceolate or oblanceolate-spatulate, 1–2 mm, involute when dry; disk florets yellow, 4.8–5.3 mm, tube 2.2–2.3 mm, limb cylindric to narrowly funnelform, lobes lanceolate, 0.4–0.5 mm, purplish, glabrous. Achenes straw-colored, oblong, flattened, 2–2.2 mm, strigose, 4-veined. Pappus yellowish to brownish, 2-seriate, outer bristles 0.3–0.4 mm, inner 4.8–5.5 mm. Fl. Jul–Sep.

Forest margins, stony slopes; 2000–3600 m. W Sichuan, E Xizang, NW Yunnan [Afghanistan].


紫茎蓬 zi jing fei peng

Herbs, perennial, 5–7 cm tall, caespitose; rhizome subwoody or tuberiform, collar clad with marcescent leaf bases. Stems several or single, ca. 1 mm in diam., erect or ascending, purple, branched in middle part, rarely simple, sparsely hirsutulous, strigillose, short-stipititate glandular below capitula. Leaves: basal rosulate, present at anthesis, narrowly winged petiolid, blade spatulate to oblanceolate, 1.5–2.5 × 0.3–0.6 cm, surfaces glabrous, 3-veined, base attenuate, margin entire or 2- or 3-serulate, ciliate, apex obtuse or rounded; cauline 3–5, sessile, blade lance-linear or linear, 0.5–2 × 0.1–0.3 cm, surfaces strigillose, often stipitate glandular (not seen), 1- or inconspicuously 3-veined, margin strigose-ciliate, apex acute. Capitula 2 or 3 in corymbiform synflorescences, rarely solitary, 0.8–1.5 cm in diam. Involucre hemispheric, 5–8 × 5–12 mm; phyllaries 3-seriate, purple, linear-lanceolate, ca. 0.5 mm wide, apex acuminate, inner shorter than to equaling disk florets, abaxially sparsely hirsute-villosus, strigillose, often stipitate glandular at base (not seen), outer 2–3 mm, inner ca. 8 mm, margin narrowly scarious. Ray florets laminate, 2- or 3-seriate, 6–7 mm, tube ca. 3 mm, hairy, lamina almost filiform, purple, ca. 0.3 mm wide, not patent, involute when dry; disk florets yellow, 4.4–5.5 mm, tube ca. 1.7 mm, limb narrowly funnelform, sparsely hairy, lobes triangular, ca. 0.5 mm, purplish. Achenes oblong, compressed, ca. 2 mm (immaure), strigose. Pappus yellowish, 2-seriate, outer bristles ca. 0.5 mm, inner ca. 5 mm. Fl. Aug–Sep.

Grasslands on mountain slopes. Sichuan (Kangding).


柄叶蓬 bing ye fei peng

**Erigeron pseudoneglectus** Popov.

Herbs, perennial, 5–28 cm tall, sometimes caespitose; rhizome short. Stems several, erect, simple, green or reddish, moderately to densely hirsute-villosus, sparsely strigillose. Leaves: petiolid, margin, and surfaces hirsute-vilosus, sometimes glabrare or only margin ciliate; basal present at anthesis, long petiolate, blade oblanceolate or oblanceolate-spatulate, 1.5–2 × 0.2–0.4 cm, 3-seriate, based attenuate, margin entire or sometimes 2–4-serulate, strigillo-ciliate, apex obtuse or rounded; lower cauline identical to basal, shortly petiolate, mid and upper sessile, blade linear or linear-lanceolate, 1–2 × 0.1–0.2 cm, surfaces strigillose, short-stipititate glandular, 1–3-veined, margin strigillose-ciliate, apex shortly acuminate. Capitula solitary or 2 or 3 in corymbiform synflorescences, 1–1.5 mm in diam.; peduncles slender; bracts 1–3, linear or subulate. Involucre hemispheric, 3–4 × 8–10 mm; phyllaries 3-seriate, green, linear-lanceolate, ca. 0.5 mm wide, shorter than disk florets, abaxially sparsely strigillose, densely short-stipititate glandular, apex acute to acuminate, outer ca. 1/2 as long as inner, inner 3–4 mm, margin narrowly scarious. Ray florets 2- or 3-seriate, reddish, 6–7 mm, equaling or ± longer than disk florets, tube 2.5–3 mm, hairy, lamina ca. 0.3 mm wide, involute; disk florets yellow, 3.5–4 mm, tube 1–1.5 mm, limb narrowly funnelform, lobes lanceolate, ca. 0.4 mm, reddish. Achenes oblong, compressed, ca. 2 mm (immaure), sparsely strigoso, 2-seriate. Pappus (immaure) yellowish brown, 2-seriate, outer bristles very short, inner ca. 4 mm. Fl. Jul–Sep.

Stony open slopes; ca. 2200 m. SW and W Sichuan (Kangding, Muli).

This species differs from **Erigeron himalajensis** by its slender stems, strigose-citate leaf margin, and glandular upper leaf surface.
Alpine or subalpine meadows, rocky slopes; 2700–3100 m. N Xinjiang (Qinghe) [Kazakhstan, Russia (N Siberia), Uzbekistan].


Herbs, perennial, 5–25 cm tall, ± caespitose; caudex branched. Stems several, sometimes single, erect or ascending, green or reddish, simple, sometimes branched, hirsute-villos (at least some crosswalls purple in upper part), strigillose, more densely so upward, eglandular. Leaves green, surfaces sparsely hirsute-villos, margin entire, sparsely vili-ciliate (some crosswalls yellow); basal rosulate, withered at anthesis, long petiolate, blade oblanceolate, 1.5–9.5 × 0.2–0.8(–1.3) cm, base attenuate, apex obtuse; cauline 2–8, lower identical to basal, short-winged petiolate, mid and upper sessile, blade lanceolate to linear-lanceolate, 1–5(–5.5) × 0.2–0.8 cm, base ± subclasping, apex acute. Capitula solitary, rarely 2 or 3 in corymbiform synflorescences, 9–14 × 19–25 mm. Involucre hemispheric; phyllaries 3-seriate, apex purple, appressed, ± equaling disk florets, lanceolate to linear-lanceolate, densely hirsute-villos at base (at least some with purple crosswalls), distally sparsely villous to glabrate, eglandular, membranous, apex acuminate, outer 4.2–5.2 × 0.5–0.6 mm, inner 5–9 × 0.6–1 mm, margin narrowly scarious. Ray florets purple, violet, or lilac, rarely white, 6.6–10 mm, tube 2–2.5 mm, lamina ca. 0.5 mm wide, hairy proximally, involute when dry; disk florets yellow, 3.5–4 mm, tube 1.5 mm, limb cylindric, abruptly ampliate, tube and limb hairy, lobes lanceolate, 0.3–0.4 mm, tip pink, anthers and style branches not exserted from corolla. Achenes narrowly oblong, flattened, 2–2.7 mm, strigate, 2-veined. Pappus brownish, 2-seriate, outer bristles 0.4–0.5 mm, inner 3.6–4 mm. Fl. Jun–Aug.

Alpine or subalpine meadows, stony slopes; 2500–3600 m. N Xinjiang [Kazakhstan, Uzbekistan].


Herbs, biennial or short-lived perennial, 3–30 cm, caespitose; rizohose weak. Stems usually several, 1–1.5 mm in diam., erect or ascending, slenderly branched, green or purplish tinged, sparsely hirsute, especially upward. Leaves basal, rosulate, petiolate or subsessile, blade linear-lanceolate to oblanceolate or spatulate, 1–10 cm × 0.15–6 mm, surfaces sparsely hirsute, margin entire, hirsute-ciliate, apex acute; cauline few, sessile, ± subclasping, blade linear, upper reduced gradually. Capitula 8–10 × 15–20 mm, solitary or several in racemiform, rarely paniculiform synflorescences, long pedunculate. Involucre hemispheric; phyllaries 3-seriate, linear-lanceolate, abaxially hirsute, apex acuminate, outer almost 1/2 as long as inner, inner yellowish green, purple at apex, often exceeding or sometimes equaling disk florets, 5.5–8.5 × 0.5–0.75 mm, margin narrowly scarious. Ray florets 3– or 4-seriate, lilac or pink to pale violet, 5–7 mm, tube 2.5–3 mm, hairy distally, lamina involute; disk florets pale yellow, ca. 4.2 mm, hairy, tube ca. 2 mm, limb narrowly cylindric, lobes lanceolate, ca. 0.2 mm, glabrous, often purplish tinged, anthers and style branches not exserted from corolla. Achenes straw-colored, narrowly oblong, 1.5–2 × 0.3 mm, sparsely strirose, petiolate. Pappus yellowish, 2-seriate, outer bristles 0.6 mm, inner 4.5–5 mm. Fl. Jul–Sep.

Meadows on banks of rivers, lakes, and marshes, lower mountain plains. N Xinjiang [Kazakhstan, Mongolia, Russia (Siberia); Iran, North America].


Herbs, perennial, 5–10(–15) cm tall, ± caespitose; caudex short, branched. Stems several, rarely single, erect or ascending, ca. 2 mm in diam. at base, simple, green or reddish, ± densely yellowish hirsute-villos, more so under capitulum, strigillose, eglandular. Leaves green or grayish, surfaces hirsute-villos, rarely glabrate, margin entire, villous-ciliate; basal present at anthesis, petiolate, blade oblanceolate, 1–7 × 0.2–0.9 cm, base attenuate, apex obtuse or rounded; caluine 4–8, sessile, blade lanceolate to oblong, 0.7–4 × 0.1–0.8 cm, base subclasping, apex acute. Capitula solitary, sometimes 2, 1–1.7 × 2–3 cm. Involucre hemispheric; phyllaries 3-seriate, equal, exceeding disk florets, ± loose, purplish or rarely green, lanceolate, 7–9.5 × 0.8–1 mm, densely yellowish villous at base to glabrate apically, apex acute, sometimes ± reflexed. Ray florets pink or lilac, 6.5–8.5 mm, tube 2–2.7 mm, hairy above, lamina ca. 0.5 mm wide, involute when dry; disk florets yellow, ca. 4.9 mm, tube ca. 1.5 mm, limb cylindric, abruptly ampliate, tube and limb hairy, lobes triangular, 0.3–0.5 mm, pink or lilac, anthers and style branches not exserted from corolla. Achenes narrowly oblong, flattened, 2–2.7 mm, strigate, 2-veined. Pappus brownish, 2-seriate, outer bristles 0.4–0.5 mm, inner 3.6–4 mm. Fl. Jun–Aug.

Alpine or subalpine meadows, rocky slopes; 2700–3100 m. N Xinjiang [Kazakhstan, Russia (N Siberia), Uzbekistan].
Herbs, biennial or short-lived perennial, 2.5–25 cm tall; rhizome weak. Stems solitary, 1–2.5 mm in diam. at base, erect or ascending, simple, or rarely branched, green or sometimes purple-red, densely hirsute, strigillose. Leaves few, margin and petiole hirsute-ciliate, surfaces glabrous or glabrate to sparsely hirsute; basal withered at anthesis, long petiolate, petiole hirsute-ciliate, surfaces glabrous or glabrate to sparsely hirsute; basal withered at anthesis, long petiolate, petiole base subclasping, blade oblanceolate, 1–3–(7) × 0.2–0.4 cm, base attenuate, apex obtuse to rounded, mucronate; cauleine 4–7, sessile, blade linear or linear-lanceolate, 1–4 × 0.1–0.3 cm, apex acute, uppermost often overtopping capitula. Capitula usually solitary, or sometimes 2–8 in racemose synflorescences, ca. 0.8 × 1.5–1.8 cm. Involucre hemispheric; phyllaries 3-seriate, green or purple at apex, linear-lanceolate, (5–)8–9 × 0.6–1 mm, abaxially sparsely villous-hirsute, outer 1/2 as long as inner or less, inner conspicuously exceeding disk florets, margin scarios. Ray florets 2- or 3-seriate, pale violet, 6–7 mm, tube ca. 2 mm, hairy above, lamina involute when dry; disk florets yellowish, 4–4.5 mm, hairy, tube ca. 1.5 mm, limb cylindric, lobes lanceolate, ca. 0.6 mm, purple tinged, anthers and style branches not exserted from corolla. Achenes narrowly oblong, compressed, 2–2.5 × ca. 0.6 mm, strigose. Pappus 2-seriate, yellowish, outer bristles ca. 0.5 mm, inner 4.5–5 mm. Fl. Jul–Sep.

Subalpine meadows, moist places on slopes; ca. 2500 m. N Xingjiang (Qinghe) [Kazakhstan, Mongolia, Russia (Siberia)].


Herbs, perennial [or rarely annual], taprooted; caudex simple [or rhizomatous]; herbage strigose to hirsute. Stems branched. Leaves basal (withered at anthesis) and cauleine, spatulate to oblanceolate or linear, base not clasping, margin [entire or] serrate or coarsely serrate. 

2–2.5 × ca. 0.6 mm, strigose. Pappus 2-seriate, yellowish, outer bristles ca. 0.5 mm, inner 4.5–5 mm. Fl. Jul–Sep.

Subalpine meadows, moist places on slopes; ca. 700 m. Naturalized in Hong Kong [native to Central America and North America (Mexico)].

Erigeron karvinskianus has become a pantropical and subtropical weed.


Herbs, annual or biennial [or short-lived perennial], caespitose, [10–]15–40+[–100] cm tall; caudex short, simple or few branched, taprooted. Stems creeping or prostrate to ascending or erect, sometimes rooting at nodes, branched upward, sometimes with axillary leaf tufts, sparsely strigose to glabrate, eglandular. Leaves: basal and lower usually withered at anthesis, petiolate, petiole narrowly winged, blade elliptic or obovate; cauleine shortly petiolate, elliptic to obovate or oblanceolate, 1–4 × 0.3–1.4 cm, even sized, surfaces sparsely strigose to glabrate, eglandular, base attenuate to cuneate, margin 2–4-lobed or entire, slightly revolute, strigose, apex acute or acuminate, mucronulate. Capitula 1 or 2[–5] at ends of upper branches, 5–7 × 10–13 mm. Involute campanulate; phyllaries 3– or 4-seriate, membranous, linear to lanceolate, 1.5–3.3 × 0.3–0.6 mm, sparsely strigose, apex acuminate, outer slightly shorter, green along midvein, inner margin narrowly scarios, erose. Ray florets female, 1- or 2-seriate, 45–80, 6–8 mm, tube 1–1.5 mm, lamina flat or slightly coiling, white, sometimes pinkish upon drying, linear, ca. 5 × 0.6 mm, 2-denticulate at apex, glabrous; disk florets bisexual, yellow, narrowly funnelform, tube ca. 2 mm, sparsely hairy, veins orange, lobes glabrous, apex papillate. Achenes oblong, flattened, ca. 0.8 mm (immature), sparsely strigose, 2-veined. Pappus 2-seriate, outer of short setae, inner bristles 15–27, ca. 2.5 mm. Fl. Mar–Nov.

Hillsides, escaped from cultivation; ca. 700 m. Naturalized in Hong Kong [native to Central America and North America (Mexico)].

29. Erigeron annuus (Linnaeus) Persoon, Syn. Pl. 2: 431. 1807 ['annuus'].

Herbs, annual or biennial [or short-lived perennial], fibrous-rooted [rarely rhizomatous, caudex simple]; herbage strigose to sparsely hirsute. Stems branched. Leaves basal and cauleine, oblanceolate, base not clasping, margin serrate. Capitula nodding in bud, numerous in loosely corymbose or paniculiform synflorescences. Ray floret lamina narrowly strap-shaped, white, spreading, not or slightly coiling. Achenes narrowly oblong, ca. 0.8 mm, 2- or 3-seriate, pale violet, 6–7 mm, tube ca. 2 mm, hairy above, lamina involute when dry; disk florets yellowish, 4–4.5 mm, hairy, tube ca. 1.5 mm, limb cylindric, lobes lanceolate, ca. 0.6 mm, purple tinged, anthers and style branches not exserted from corolla. Achenes narrowly oblong, compressed, 2–2.5 × ca. 0.6 mm, strigose. Pappus 2-seriate, yellowish, outer bristles ca. 0.5 mm, inner 4.5–5 mm. Fl. Jul–Sep.

Subalpine meadows, moist places on slopes; ca. 2500 m. N Xingjiang (Qinghe) [Kazakhstan, Mongolia, Russia (Siberia)].
Herbs, annual, [10–]30–100[–150] cm tall. Stems erect, branched in upper part, sparsely hispid, strigose above (hairs spreading). Leaves: surfaces strigose-hirsute or sometimes glabrate, eglandular; basal withered at anthesis, winged petiolate, blade elliptic or broadly ovate, rarely spathulate, 4–17 × 1.5–4 cm or more, base attenuate, margin coarsely serrate, scabrous, apex acute or obtuse; lower cauline similar, slightly petiolate, mid and upper slightly petiolate or sessile, blade oblong-lanceolate or lanceolate, 1–9 × [0.3–]0.5–2 cm, margin irregularly serrate to subentire, apex acute, uppermost linear. Capitula 5–50+, in loose panículiform or corymbiform synflorescences, 6–8 × 10–15 mm. Involucre hemispheric; phyllaries 2– or 3(or 4)-seriate, greenish or ± brownish, abaxially sparsely hirsute, minutely glandular, subequal or outer shorter, lanceolate, 3–5 × 0.5–1 mm, herbaceous. Ray florets 80–125, 2-seriate, [4–]6–8[–10] mm, tube 1–1.5 mm, sparsely hairy above, blade obtuse, lamina white 0.5–1 mm, herbaceous. Ray florets 50–100, 2-seriate, 4–6 mm, lamina white, sometimes pinkish or bluish, linear, flat; disk florets yellow, 1.5–2 mm. Achenes lanceolate, flattened, 0.9–1.2 mm, sparsely strigillose. Pappus 2-seriate, outer of scales or setae, inner absent in ray florets, in disk florets of [8–]10–15 long bristles. Fl. Jun–Sept.

Wastelands, roadsides; sea level to 1100 m. Naturalized in Anhui, Fujian, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Shandong, Sichuan, Xizang [native to E North America; widely introduced worldwide].

This species is spreading in China and is probably more widespread than shown here.


4. Erigeron sect. Trimorpha (Cassini) Candolle, Prodr. 5: 290. 1836 ["Trimorphaea "].


Herbs, annual, biennial, or perennial, taprooted or fibrous-rooted; caudex simple. Stems usually branched. Leaves basal and cauline, oblongate or oblong to lanceolate or linear-lanceolate, base not clasping, margin entire or sparsely serrate. Capitula erect in bud, few or numerous, in corymbiform or broadly racemiform synflorescences. Ray florets 3–5-seriate, in 2 zones, outer 1–3 lamina filiform, white to pink or purplish, erect, not coiling or reflexed, inner 2 elaminate. Achenes 2–2.4 mm, 2-veined. Pappus of 2–2.4 mm, 2-veined. Pappus 2-seriate, outer of scales or setae, inner absent in ray florets, in disk florets of 8–15 long bristles. Fl. Jun–Sept.

About 30 species: Asia, C and N Europe, North America; six species (one endemic) in China.

1a. Ray floret lamina equaling or slightly longer than disk florets; phyllaries shorter than disk; biennial or perennial herbs

1b. Ray floret lamina longer than disk florets, rarely only slightly so; phyllaries shorter than or almost equaling disk; perennial herbs.

2a. Ray florets blue ................................................................................................................................................. 34. E. tianschanicus

2b. Ray florets pink or lilac.

3a. Stems and phyllaries stipitate glandular and hirsute-villous; leaves lanceolate to oblongate.

4a. Stems densely stipitate glandular at least below capitula and sparsely hirsute-villous; ray florets pink .............................................................................................................................................. 32. E. krylovii

4b. Stems sparsely stipitate glandular and densely villous, lower part almost entirely densely villous; ray florets pink or lilac .............................................................................................................................................. 33. E. pseudoseravschanicus

3b. Stems strigilllose or strigose, or glabrate at base, phyllaries villous or strigillose, sometimes sparsely short-stipitate glandular; leaves linear-lanceolate or linear.

5a. Stems reddish; leaf blade linear-lanceolate to linear, margin entire; phyllaries reddish or rarely green, villous, inner shorter than disk florets ........................................ 35. E. schmalhausenii

5b. Stems green; leaf blade linear, margin serrate or subentire; phyllaries green or reddish at apex, inner shorter than or almost equaling disk florets ........................................ 36. E. fukayamae

飞蓬 fei peng

Herbs, biennial or perennial, 5–70(–100) cm, taprooted or woody rhizomatous. Stems solitary or sometimes several, 1–6 mm in diam. at base, erect, branched in upper part, strigillose, ± hirsute or hirsut, or sometimes glabrate, short-stipitate glandular below capitula. Leaves thin, surfaces sparsely to ± densely strigose-villous, glabrate, or glabrous, margin entire or remotely serrulate or serrate, strigose- or villous-ciliate; basal present or absent at anthesis, long petiolate, oblanceolate or oblong, 1.5–13 × 0.3–1.8 cm, inconspicuously 3-veined, base attenuate, apex obtuse or acute; mid and upper cauline sessile, blade lanceolate or oblong, 0.3–8.5 × 0.1–1 cm, base subclasping, apex acute, arculate, or obtuse. Capitula numerous, in dense and narrow, or rarely loose and broad, paniculiform or sometimes corymbose synflorescences, sometimes few in corymbose synflorescences, 6–13 × 10–25 mm. Involucre hemispheric; phyllaries 3-seriate, green or purple, lanceolate to linear-lanceolate, abaxially ± densely villous or sparsely strigose, sometimes ± densely short-stipitate glandular, apex acute to acuminate, outer almost 1/2 as long as inner, inner shorter than disk florets, 5–7.5 × 0.5–1 mm, margin scarious. Ray florets 4- or 5-seriate, outer 2 or 3 series laminate, 5–7 mm, tube 2.5–3.5 mm, sparsely hairy, lamina pink or lilac, rarely white, ca. 0.25 mm wide, inner 2 series reduced to tube, uncolored, 2.5–3.5 mm, style exceeding tube by 1.2–2 mm, sometimes with rudimentary lamina; disk florets yellow, lobes sometimes ± purplish or dark lilac, 3.6–5.4 mm, sparsely hairy, tube 1.5–2.9 mm, limb cylindrical or cylindric-funnelform, lobes lanceolate, 0.4–0.5 mm. Achenes straw-colored, oblong or oblong-lanceoloid, ± compressed, 1.6–2.5 mm, ± strigose, 2-veined. Pappus 1- or 2-seriate, white or whitish, outer bristles 0.2–0.5 mm, inner 4–6 mm. Fl. Jul–Sep.

Meadows, pastures, grasslands on slopes, forest margins; 700–3500 m. Gansu, Guangdong, Guangxi, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Afghanistan, Japan, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Russia (Kamchatka, Siberia), Uzbekistan; SW Asia, Europe, North America].

"Erigeron acer" is an alternate spelling.

1a. Stems and phyllaries purple, rarely green; phyllaries densely stipitate glandular, sometimes also sparsely hirsut; capitula many, in corymbose-paniculiform synflorescences .................. 31c. subsp. politus

1b. Stems and phyllaries green, rarely purplish; phyllaries densely or sparsely villous, mixed with appressed short hairs; capitula numerous, in paniculiform or racemiform synflorescences.

2a. Basal and lower cauline leaf margin entire or remotely serrulate; phyllaries abaxially ± densely villous, often short-stipitate glandular; capitula usually in dense, narrow, paniculiform synflorescences .............................................. 31a. subsp. acris

2b. Basal and lower cauline leaf margin remotely serrate; phyllaries abaxially sometimes sparsely strigose, densely short-stipitate glandular; capitula usually in loose, broad, paniculiform synflorescences .................................................. 31b. subsp. kamtschaticus

31a. Erigeron acris subsp. acris

飞蓬(原亚种) fei peng (yuan ya zhong)

*Erigeron kamtschaticus* Candolle var. *hirsutus* Y. Ling; *Trimorpha acris* (Linnaeus) Gray; *T. vulgaris* Cassini, nom. illeg. superfl.

Herbs, 5–60 cm tall. Stems solitary, sometimes several, 1–4 mm in diam. at base, green or rarely purplish, moderately to densely hirsute-villous, strigillose, or sometimes glabrate. Leaves: surfaces ± densely strigose-villous, thin, margin entire or rarely remotely serrulate, strigose-villous-ciliate; basal dense, often present at anthesis, blade oblanceolate, 1.5–10 × 0.3–1.2 cm, apex obtuse or acute; mid and upper cauline lanceolate, 0.5–8 × 0.1–0.8 cm, uppermost and branch leaves small, linear. Capitula numerous, in dense, narrow, or rarely loose and broad, paniculiform or sometimes corymbose synflorescences, 6–10 × 11–21 mm. Phyllaries abaxially ± densely villous, often short-stipitate glandular, apex acute, inner 5–7 × 0.5–0.8 mm. Ray florets: outer series 5–7 mm, tube 2.5–3.5 mm; inner series 3–3.5 mm, style exceeding tube by 1–1.5 mm; disk florets 3.6–5 mm, tube 1.5–2 mm, limb cylindric. Achenes oblong-lanceolate, ca. 1.8 mm, sparsely strigose. Pappus 2-seriate, inner 4–6 mm. Fl. Jul–Sep.

Meadows, pastures, forest margins; 1400–3500 m. Gansu, Guangxi, Hebei, Hunan, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Afghanistan, Japan, Kazakhstan, Korea, Mongolia, Russia (W Siberia), Uzbekistan; SW Asia, Europe].


堪察加飞蓬 can cha jia fei peng

*Erigeron kamtschaticus* Candolle, Prodr. 5: 290. 1836; *E. acris* var. *kamtschaticus* (Candolle) Herder; *E. acris* var. *manshuricus* Komarov; *E. angulosus* Gaudin var. *kamtschaticus* (Candolle) H. Hara; *E. kamtschaticus* var. *manshuricus* (Komarov) Koidzumi; *Trimorpha acris* var. *kamtschatica* (Candolle) G. L. Nesom.

Herbs, 30–70(–100) cm. Stems solitary or several, 1–6 mm in diam. at base. Leaves: surfaces sparsely strigose or strigillose, or glabrate or glabrous, thin; basal often withered at anthesis, blade oblanceolate, 2–13 × 0.3–1.8 cm, margin remotely serrate, strigose-ciliate, apex acute; mid and upper cauline blade lanceolate, 0.3–8.5 × 0.4–1 cm, margin entire, sparsely strigose-ciliate. Capitula numerous in loose, broad, paniculiform or sometimes few in corymbose synflorescences, 6–10 × 10–19 mm. Phyllaries abaxially sometimes...
sparsely strigose, densely short-stipitate glandular, apex acute to acuminate, inner 5–6.5 × 0.6–0.7 mm, margin scarious. Ray florets: outer series 5–6.2 mm, tube 3–3.5 mm, inner 2.5–3 mm, style exceeding tube by 1.5–2.2 mm, sometimes with reduced lamina and pink tipped; disk florets lobes purplish, 4–5.4 mm, tube 2–2.9 mm, limb cylindric-funnelform. Achenes oblong, 1.6–2.5 mm, strigose. Pappus whitish, 2-seriate, inner 5.5–6 mm. Fl. Jun–Sep.

Grasslands on slopes, forest margins; 700–1200 m. Gansu, Guangdong, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi [Mongolia, Russia (Kamchatka, W Siberia); Guangdong, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Nei Mongol, Xinjiang, Xizang [Kazakhstan, Russia (Siberia), Uzbekistan].


长茎飞蓬 chang jing fei peng

Erigeron politus Fries, Summa Veg. Scand. 1: 184. 1845; E. elongatus Ledebour (1833), not Moench (1802); Trimorph elongata Vierhapper; T. polita (Fries) Vierhapper.

Herbs, 10–50 cm tall, sometimes ± caespitose; rhizome woody, ascending. Stems usually several, 1–4 mm in diam. at base, purple, rarely green, strigillosely, sparsely hirsute. Leaves green or with reddish petioles, glabrous, rigid, margin entire, strigose-ciliate; basal and lower cauline long petiolate, blade oblanceolate or oblong, 1.0–1.1 mm, apex obtuse; mid and upper sessile, blade oblong or lanceolate, ± 0.7 × ca. 0.8 mm, apex arcuate or obtuse. Capitula many, in corymboform or corymbose-paniculiform synflorescences, often on long branches, 9–13 × 17–25 mm. Phyllaries 3-seriate, purple, rarely green, densely short-stipitate glandular, sometimes also sparsely hirsute, apex acuminate, inner 5.5–7.5 × 0.7–1 mm.

Ray florets: outer 6–8 mm, tube 3–4.3 mm, lamina pink or lilac, 0.3–0.5 mm wide, inner 2.5–4.5 mm, style exceeding tube by 1–1.7 mm, sometimes with rudimentary lamina; disk florets yellow, lobes dark lilac, 3.5–5.4 mm, tube ca. 2.3 mm. Achenes 2.2–2.5 mm. Pappus white, 1- or 2-seriate, inner 4.5–6 mm. Fl. Jul–Sep.

Meadows on slopes of low mountains, forest margins; 1900–2600 m. Gansu, Hebei, Heilongjiang, Jilin, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang [Kazakhstan, Kyrgyzstan, Russia (Siberia); C and N Europe].


西疆飞蓬 xi jiang fei peng

Herbs, perennial, 5–60 cm tall, sometimes caespitose; rhizome woody; caudex branched. Stems several, 1–3 mm in diam. at base, erect, branched, green, sometimes reddish, ± densely hirsute-villosulous, sometimes also strigilllose, rarely glabrate, sparsely stipitate glandular. Leaves green, surfaces sparsely hirsute-villosulous, sometimes also sparsely stipitate glandular, notably on petioles, margin entire or sparsely serrate, hirsute-ciliate; basal long petiolate, petiole base claspimg, blade lanceolate to oblanceolate, 1.5–3 × 0.3–1.6 cm, base attenuate, apex acute or obtuse; cauline 0.3–1.3 × 0.5–1.1 cm, lower similar to basal, upper lanceolate, sessile, apex acute. Capitula usually many, in corymbose-racemiform synflorescences, sometimes solitary, 7–14 × 13–30 mm. Involucre hemispheric; phyllaries 3-seriate, green, sometimes reddish, slightly shorter than disk florets, linear-lanceolate, hirsute-villosulous or rarely glabrous, stipitate glandular, apex acute, outer ca. 1/2 as long as inner, inner 5–7 × ca. 0.8 mm, margin scarious. Ray florets 3-seriate, outer 2 series laminar, 5.8–8.5 mm, tube 2.2–3.5 mm, lamina pink or lilac, ca. 0.3 mm wide, inner tubular, uncolored, tube 2.2–3.3 mm, apex hairy, style exceeding tube by 1–1.5 mm, uncolored; disk florets yellow, lobe tips purple, 4–4.7 mm, tube 1.5–2 mm, hairy, limb cylindric-funnelform, lobes lanceolate, ca. 0.4 mm. Achenes tan, oblanceoloid, compressed, 2–2.2 mm, strigose. Pappus 2-seriate, outer bristles very short, 0.4–0.6 mm, inner 4.5–5.3 mm. Fl. Jul–Sep.

Subalpine or alpine meadows, forest margins; 1700–2800 m. N Xinjiang [Kazakhstan, Russia (Siberia), Uzbekistan].

Two forms have been recognized in China: Erigeron pseudoseravschanicus f. pseudoseravschanicus and E. pseudoseravschanicus f. glabrescens Y. Ling & Y. L. Chen (Acta Phytotax. Sin. 11: 426. 1973). The latter, described from Qinghe, has stems and leaves glabrous or glabrate, only upper part and phyllaries stipitate glandular.


天山飞蓬 tian shan fei peng

E. caeruleus Urban (1912).

Herbs, perennial, 5–60 cm tall, caespitose; rhizomes woody; caudex branched. Stems several, 1–3 mm in diam., green or reddish, branched, hirsute-villous, stipitate glandular, sometimes also strigillose. Leaves green, surfaces sparsely hirsute-villous or glabrous, sparsely to densely stipitate glandular (or rarely eglandular), margin entire, hirsute-ciliate; basal long petiolate, petiole base clasping, blade oblanceolate or lanceolate, 2–15 × 0.2–0.8 (–1.7) cm, base attenuate, apex acute to obtuse, mucronate; cauleine 0.5–2 × 0.1–0.3 cm, lower similar to basal, upper sessile, blade lanceolate to linear-lanceolate, subclasping, apex acute. Capitula several, in corymbose-racemiform synflorescences, 7–11 × 14–23 mm. Involucre hemispheric; phyllaries 3-seriate, green, slightly shorter than disk florets, linear-lanceolate, 5.9–8 mm, tube 2.5–3 mm, blue, ca. 0.5 mm wide; disk florets yellow, lobes pinkish or purplish, 4.5–5.9 mm, tube ca. 2 mm, hairy. Achenes straw-colored, obovate, compressed, 2.2–2.3 mm, densely strigose. Pappus yellowish to orangish, 2-seriate, outer bristles short, inner ones 5–6.7 mm. Fl. Jun–Sep.

Glacial moraines and mountains; 1600–3600 m. W Xinjiang [Kazakhstan, Russia (W Siberia), Uzbekistan].


Taiwan 飞蓬 tai wan fei peng

Erigeron fukuyamae Hayata var. fukuyamae (Kitamura) Kitamura.

Herbs, perennial, 10–30 cm tall, caespitose; rhizome short; caudex branched. Stems several, 1–1.5 mm in diam., erect or ascending, branched above, green, sparsely strigose, sometimes glabrate at base, stipitate glandular. Leaves: basal rosulate, withered, rarely present at anthesis, long petiolate, blade linear, 2–7 × 1–1.5 cm, glabrate or surfaces strigillose, leathery, 1-veined, margin serrate or subentire, apex acute or obtuse; cauleine usually many, dense, upper sessile, gradually diminished, 2–6 × 0.1–0.3 cm, margin entire or sometimes remotely serrulate, on synflorescence branches very small, 5–6 mm. Capitula 3–9 in loose corymbose synflorescences, 1.5–2.3 cm in diam.; peduncles 3–10 cm. Involucre hemispheric, 5–8 × 10–18 mm; phyllaries 3-seriate, equal, green or reddish at apex, linear-lanceolate, 0.5–0.7 mm wide, axially strigillose, sometimes also sparsely strigose, apex acuminate, outer 4–5 mm, inner 5–8 mm, margin scarious. Ray florets in 2 forms, outer lanceolate, ca. 6 mm, tube ca. 2.5 mm, sparsely hairy above, lamina reddish, ca. 0.5 mm wide, mid-inner tubular, ca. 2 mm; disk florets bisexual, yellow, tubular, ca. 4 mm, with scattered appressed fine hairs. Achenes oblong, ca. 2 × 0.5 mm, flattened, with appressed fine hairs. Pappus white or brownish, 2-seriate, outer bristles short, inner 3.5–4 mm. Fl. Apr–Jul.

• Alpine meadows, exposed forest roadsides; 1800–3000 m. Taiwan.


小蓬草组 xiao peng cao zu


Herbs, annual [or subshrubs], taprooted [caudex simple]; herbage hirsute or glabrate. Stems branched. Leaves linear to lanceolate or oblanceolate, base not clasping, margin entire or sparsely serrate. Capitula erect in bud, numerous, in paniculiform or loosely corymbose synflorescences. Ray florets white, lamina filiform, slightly longer than involucre, erect, not coiling or reflexed. Achenes 0.8–1.5 mm. Pappus 1-seriate, of 11–25 bristles, not accrescent.

Six species: North and South America, one species widely introduced worldwide in temperate to tropical regions, including China.

*Conyza canadensis* (Linnaeus) Cronquist; *Conyzella canadensis* (Linnaeus) Ruprecht; *Leptilon canadense* (Linnaeus) Britton; *Marsea canadensis* (Linnaeus) V. M. Badillo.

Herbs, annual, 50–100 cm tall or more; root fusiform, fibrous rooted. Stems erect, sparsely hirsute, branched above, densely leafy. Leaves: basal withered at anthesis, lower petiolar, oblanceolate, [2]–6–10 × [0.4]–1.5 cm, surfaces or only adaxially sparsely pilose, base attenuate, margin sparsely serrate or entire, apex acute or acuminate; mid and upper subsessile or sessile, blade linear-lanceolate or linear, smaller, margin entire or rarely 1- or 2-toothed. Capitula 3–4 mm in diam., numerous, in terminal, large paniculiform synflorescences; peduncles slender, 5–10 mm. Involucre subcylindric, 2.5–4 mm; phyllaries 2- or 3-seriate, greenish, abaxially sparsely strigose [or glabrous], linear-lanceolate or linear, acuminate, outer ca. 1/2 as long as inner, inner 3–3.5 × ca. 0.3 mm, margin scarious, glabrous. Ray florets 20–30–(45), white, 2.5–3.5 mm, lamina slightly longer than disk floret, apex 2-denticulate; disk florets 8–30, yellowish, 2.5–3 mm, tube sparsely puberulent, lobes 4 or 5. Achenes linear-lanceoloid, compressed, 1–1.5 mm, sparsely strigillose. Pappus 1-seriate, dirty white, bristles 15–25, 2.5–3 mm. Fl. May–Sep.

Common weed of open places, field margins, roadsides, dry stream-sides; sea level to 3000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [native to North America].


Herbs, annual or biennial [or perennial], tap-rooted [caudex simple]; herb hirsute to strigose [often glandular]. Stems simple or branched. Leaves linear to lanceolate, oblanceolate, or spatulate, base clasping or not, margin coarsely serrate or pinnatilobed, or rarely entire. Capitula erect in bud, in paniculiform, racemiform, or racemose-paniculiform synflorescences. Ray florets white, or purplish, short, filiform, apex 2-denticulate; disk florets 8–30, yellowish, 2.5–3 mm, tube sparsely puberulent, lobes 4 or 5. Achenes linear-lanceoloid, compressed, 1–1.5 mm, sparsely strigillose. Pappus 1-seriate, dirty white, bristles 15–25, 2.5–3 mm. Fl. May–Sep.

About 60–100 species: Africa, Asia, Australia, Europe, North and South America, some species widespread weeds in tropical and subtropical regions worldwide; two species [both introduced] in China.

1a. Lower cauline leaf blade margin usually coarsely 4–8-serrate per side, apex acute or acuminate; capitula in large and long paniculiform synflorescences, peduncles 3–5 mm; involucre ca. 4 mm; pappus white, later yellowish brown; ray floret lamina short, filiform ......................................................... 38. *E. s. E. sumatrensis*

1b. Lower cauline leaf blade margin usually coarsely serrate or pinnatifoliated, sometimes entire, apex acute or obtuse; capitula in racemiform or racemose-paniculiform synflorescences, peduncles 10–15 mm; involucre ca. 5 mm; pappus reddish, sordid, or tawny; ray floret elaminate ......................................................... 39. *E. b. E. bonariensis*


*Conyza sumatrensis* (Retzius) E. Walker.

Herbs, annual or biennial, 80–150 cm tall; roots fusiform. Stems erect, thick, branched above middle, densely leafy, densely gray-white strigose, sparsely hirsute. Leaves: basal withered at anthesis, lower cauline petiolate, blade oblanceolate or lanceolate, 6–10 × 1–3 cm, surfaces densely strigose, especially abaxially, base attenuate, margin usually coarsely 4–8-serrate per side, apex acute or acuminate, mid and upper reduced, blade narrowly lanceolate to linear, margin serrate or entire. Capitula 5–8 mm in diam., numerous, in large and long paniculiform synflorescences; peduncles 3–5 mm. Involucre campanulate to urceolate, ca. 4 × 3–4 mm; phyllaries 3-seriate, gray-green, linear-lanceolate or linear, abaxially scabrous, apex acuminate, outer short or ca. 1/2 as long as inner, inner ca. 4 mm, margin scarious. Ray florets numerous, 4–4.5 mm, lamina yellowish or purplish, short, filiform, apex 2-denticulate; disk florets 6–11, yellowish, ca. 4 mm, tube sparsely puberulent. Achenes linear-lanceoloid, compressed, 1.2–1.5 mm, strigillose. Pappus white, later yellowish brown. Fl. May–Oct.

Common weed of grasslands on slopes, open places, roadsides, streamsides; 100–2500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [presumably native to South America; widely distributed as a weed in tropical and subtropical regions worldwide].


*Conyza bonariensis* (Linnaeus) Cronquist; *C. crispa* (Pourret) Ruprecht; *C. leucodasys* Miquel; *Erigeron crispus* Pourret; *E. linfolius* Willdenow; *Leptilon bonariense* (Linnaeus) Small; *Marsea bonariensis* (Linnaeus) V. M. Badillo.

Herbs, annual or biennial, 10–20–50–150 cm tall; roots fusiform, fibrous rooted. Stems erect or ascending, thin, often branched above middle, densely leafy, densely strigose, sparsely hirsute. Leaves: basal withered at anthesis, lower cauline petiolate, blade oblanceolate or oblong-lanceolate, 3–5–8 × 0.3–1.2 × 2.5 cm, surfaces densely strigose or hispidulous, base attenuate, margin usually coarsely serrate or pinnatifoliated, sometimes entire, apex acute or obtuse, mid and upper shortly petiolar or sessile, blade narrowly lanceolate or linear, 1–3–7 × 0.2–0.5 cm, margin of mid dentate, margin of upper entire. Capitula 3–10 mm in diam., numerous, in racemiform or


Perennials, rhizomatous, usually eglandular (sometimes stipitate glandular). Stems ascending to erect, usually simple, rarely branched at base, glabrous or ± densely hairy. Leaves basal and cauline, sessile or petiolate, blade cordate, ovate, obovate, elliptic, or oblong to spatulate, oblanceolate, or lanceolate, glabrate to hairy, margin entire or serrate (sometimes spinulose-serrate). Capitula radiate, numerous, usually in corymbiform synflorescences, rarely solitary. Involucre cylindric-campanulate to broadly campanulate; phyllaries in 3–7 series, unequal, based hardened (rarely wholly leaflike), glabrous or ± resinous, bases indurate, 1-veined, apices obtuse to acute. Receptacles flat to slightly convex, alveolate, epaleate. Florets fertile. Ray florets few to many, purple [or white]; disk florets few to many, bisexual, yellow, limb funnelform to campanulate, lobes 5, delate to lanceolate; anther base obtuse, apical appendage lanceolate; style branch tip lanceolate. Achenes cylindric-obconic to fusiform, ± compressed, glabrous or sparsely to densely strigillose, eglandular, 7–12(–18)-veined. Pappus persistent, reddish to yellowish, in 4 series, of numerous unequal, white; disk florets few to many, purple [or white]; disk florets few to many, bisexual, yellow, limb funnelform to campanulate, lobes 5, delate to lanceolate; anther base obtuse, apical appendage lanceolate; style branch tip lanceolate. Achenes cylindric-obconic to fusiform, ± compressed, glabrous or sparsely to densely strigillose, eglandular, 7–12(–18)-veined. Pappus persistent, reddish to yellowish, in 4 series, of numerous unequal, barleyell bristles, inner apically ± clavate.

Twenty-three species: Asia, Europe, North America; one species in China.

**Eurybia** is North American. *Eurybia sibirica* extended into N Eurasia via the Bering land bridge.


Perennials, taprooted. Stems usually erect, sometimes decumbent, often purplish, simple or sometimes branched basally or above, densely villous (sometimes lanate below capitula). Leaves: basal small, deciduous at anthesis; mid cauline sessile, blade oblong to lanceolate [or lanceolate-ovate, obovate, or spatulate], [2.5–]3–8[–9.5] × [0.6–]1–1.7[–3.5] cm, markedly veined, abaxially glabrescent or scabridulous, adaxially sparsely to ± densely villous or vil-lous-strigose, base attenuate to cuneate, subclasping, margin serrate [or entire], apex acute; upper gradually reduced, linear-oblong. Capitula solitary or 2–5[–50] in dense corymbiform synflorescences. Involucre campanulate, 10–13 mm in diam.; phyllaries 3- or 4[or 5]-seriate, purplish wholly or at apex, densely villous, membranous, green zone in distal 1/3–4/5, truncate basally, or outer often leaflike, apex ± squarrose, outer oblong-lanceolate, 4–5 × ca. 1 mm, 1-veined, margin narrowly scarious, apex acute, inner linear-lanceolate, 4–5 × 1–1.5 mm, apex acuminate. Ray florets 12–50, purple [or white to pale violet], tube 3–4 mm, lamina 7–17.5 × 0.8–1.8 mm; disk florets 25–125, yellow becoming purplish, [5–]6.5–7[–8.1] mm, tube ca. 3 mm, limb funnelform, lobes purplish, triangular, 0.5–1.1 mm. Achenes brown, fusiform, strigillose, veins 7–10. Pappus dark cinnamon to reddish, ± equaling to slightly longer than disk corolla. Fl. Jul–Aug.

Grasslands on hills; ca. 300 m. Heilongjiang [Japan, Mongolia, E Russia; N Europe, NW North America].


Perennials, taprooted. Stems usually erect, simple or branched, glabrous or hairy, often gland-dotted and/or resinous. Leaves basal and cauline, alternate, petiolate or (upper) sessile, blade oblong, obovate, oblanceolate, or spatulate to triangular, lanceolate, or linear, glabrous or ± hairy, gland-dotted, margin serrate [sometimes entire]. Capitula radiate [or discoid], usually few to numerous, in corymbiform [or paniculiform] synflorescences, sometimes solitary. Involucres globose to hemispheric or broadly urceolate [sometimes campanulate or obconic]; phyllaries in [3–]5–6[–9+] series, unequal, filiform, linear or lanceolate, glabrous or ± resinous, bases indurate, 1-veined, apices herbaceous, looped or hooked [to straight or incurved]. Receptacles flat to slightly convex, ± alveolate,
elete. Florets fertile. Ray florets [absent or] 5–60+, yellow [or orange]; disk florets (20–)100–200(–300+), bisexual, yellow, limb funnelform to campanulate, lobes 5, deltate; anther base obtuse, apical appendage lanceolate; style branch appendage lanceolate [linear to ± deltate]. Achenes ellipsoid to obovoid, ± compressed, sometimes ± 3- or 4-angled, glabrous, eglandular, [striate, ribbed, furrowed, or rugose]. Pappus deciduous, of [1 or]2–8(–15] smooth, barbellulate or barbellate, inner sometimes apically ± clavate, subulate scales or setiform awns [or 1-seriate bristles].

About 30 species: W North America and South America, introduced in Eurasia; one species (introduced) in China.

Grindelia is North American, with a disjunct distribution in South America. Fan et al. (Pl. Diversity Resources 33: 171–173. 2011) recently reported it as introduced to China.


Herbs biennial, perennial, or subshrubs, [10–]40–55[–100] cm tall. Stems erect, glabrous, resinous. Leaves: cauline sessile, oval, ovate, [obovate or oblong to spatulate, oblanceolate, lanceolate, or linear], 3.1–4.2 × 1.3–1.6 cm, glabrous, strongly gland-dotted, base ± clasping, margin usually crenate to serrate (teeth resin-tipped) [rarely entire], apex [obtuse to] acute. Capitula in corymbiform synflorescences, rarely solitary, 0.9–1.5 cm. Involucres broadly urceolate to hemispheric or globose, [8–20 mm in diam.]; phyllaries 5- or 6(–10)-seriate, reflexed to spreading or appressed, filiform or linear to lanceolate-linear, 4–7 mm, resinous, apex usually looped or hooked, subulate. Ray florets [absent or] (12–)24–36(–40), lamina elliptic, [7–14] mm; disk florets 3–4 mm, limb funnelform, lobes ca. 1 mm. Achenes stramineous [or whitish, brown, or gray], [1.5–2.8–3–4.5] mm, faces smooth, striate or ± furrowed. Pappus of 2–4(–8) deciduous, straight or contorted to curved scales or awns [2.5–4–5.5] mm, shorter than disk corollas. Fl. [Jul–]Aug–Sep[–Oct].

100–200 m or more. Liaoning [native to W North America].

The specimens were not seen by us; the description is based on Fan et al. (Pl. Diversity Resources 33: 171–173. 2011) and Strother and Wetter (Fl. North America 20: 424–436. 2006).


联毛紫菀属 lian mao zi wan shu

Chen Yilin (陈艺林 Chen Yi-ling); Luc Brouillet

Brachyactis Ledebour.

Herbs, perennial or annual, rhizomatous or taprooted, eglandular [sometimes stipitate glandular]. Stems ascending to erect, usually simple, sometimes branched distally, rarely proximally; usually hairy in decurrent lines at least distally, glabrous or hairy, proximally often glabrous. Leaves basal (sometimes persistent at anthesis) and cauline, petiolate (basal and lower cauline) or sessile, proximally often glabrous. Leaves basal (sometimes persistent at anthesis) and cauline, petiolate (basal and lower cauline) or sessile, blade cordate to elliptic, oblanceolate, spatulate, ovate, elliptic, lanceolate, or linear, faces glabrous or hairy, sometimes stipitate glandular, margin serrate, crenate, or entire, scabrous or ciliate. Capitula radiate or disciform, numerous, usually in paniculiform, sometimes in racemiform or subcorymbiform, synflorescences, sometimes solitary. Involucres cylindrical to campanulate [or hemispheric]; phyllaries in (3 or)4–6(–9) series, unequal to subequal, glabrous or hairy [rarely glandular], outer sometimes leaflike, base usually hardened, margin usually scarious, 1(–3)-veined, apex acute to obtuse, usually with a well-defined green zone, sometimes ± leaflike. Receptacles flat to slightly convex, alveolate, epaleate. Florets fertile. Ray florets few to numerous, in 1 [rarely 4 or 5+] series and laminate, or in 2–5+ series and ± elaminate, lamina white, pink, blue, or purple; disk florets few to numerous, bisexual, yellow [or rarely white], limb funnelform or cylindrical, lobes 5, deltate to lanceolate; anther base obtuse, apical appendage lanceolate; style branch tip lanceolate. Achenes obovoid or obconic, sometimes fusiform, ± compressed, glabrous or strigillose, eglandular [rarely stipitate glandular], veins (2 or)3–5(–10). Pappus persistent, white to brownish, in 4 series, of numerous ± equal, barbellate, apically acute bristles.

About 90 species: Asia, Europe, North and South America; three species (two introduced) in China.

Symphyotrichum pilosum (Willdenow) G. L. Nesom var. pringlei (A. Gray) G. L. Nesom was collected from a park in Hong Kong; it may not be established in the flora. Cultivars of S. novi-belgii (Linnaeus) G. L. Nesom and other undetermined taxa (possibly horticultural hybrids) are cultivated in China but appear not to have escaped. A cultivar of S. lanceolatum (Willdenow) G. L. Nesom is cultivated for the cut-flower market.

1a. Herbs perennial; cauline leaves lanceolate to lanceolate-ovate ................................................................. 1. S. retroflexum

1b. Herbs annual; cauline leaves linear to linear-lanceolate.

2a. Capitula disciform, ray florets elaminate in 2–5+ series, disk floret limb cylindrical; phyllaries subequal, outer sometimes longer, leaflike ................................................................. 2. S. ciliatum

2b. Capitula radiate, ray florets laminate, purple, in 1 series, disk floret limb funnelform; phyllaries unequal ...... 3. S. subulatum

倒折联毛紫菀 dao zhe lian mao zi wan

_Aster retroflexus_ Lindley ex Candolle, Prodr. 5: 244. 1836; _A. curtisii_ Torrey & A. Gray.

Herbs, perennial, 45–80 cm tall. Stems erect, sometimes purplish, glabrous (except above in lines). Leaves: basal petiolate, lanceolate to ovate, rarely rounded, usually fallen at anthesis; cauline petiolate to sessile, lanceolate to lanceolate-ovate, 5–6.5 × 0.7–1.5 cm, slightly reduced in size upward, surfaces glabrous, base attenuate to cuneate or rounded, margin serrate to crenate, sometimes entire, ciliate, apex acute to acuminate. Capitula radiate, numerous, in open, leafy, paniculiform synflorescences, branches spreading; peduncles 0.2–2.5 cm; leaflike bract usually subtending capitulum. Involucre campanulate; phyllaries 3–5-seriate, outer square, often leaflike, lanceolate to linear-lanceolate, ± unequal, outer 6–11 × 0.8–2 mm, eglandular, glabrous, margin narrowly scarious, erose, eciliate, apex acute to acuminate. Ray florets (13–)18–30 in 1 series, lamina purplish blue, (10 or)11–17 × 1.5–3 mm, glabrous; disk florets cream to pale yellow, becoming pinkish, 5–6.8 mm, limb funnelform, 3.5–5 mm, lobes erect, lanceolate, 0.9–1.2 mm, glabrous. Achenes oblancoide, ± compressed, 3–3.9 mm, sparsely strigillose, 4–6-veined. Pappus white to reddish, inner 4–4.5 mm, innermost 5–6 mm. Fl. and fr. Sep–Dec.

Roadsides along fields or in mountains. Introduced in Jiangxi [E North America].


短星菊 duan xing ju

_Erigeron ciliatus_ (Ledebour) G. L. Nesom, Icon. Pl. 1: 24. 1829; _Aster angustus_ Torrey & A. Gray; _A. brachyactis_ S. F. Blake; _A. ciliatus_ (Ledebour) B. Fedtschenko (1915), not Walter (1788), nor Muhlenberg ex Willdenow (1803), nor Nuttall (1840); _A. lati-squamatus_ (Maximowicz) Handel-Mazzetti; _Brachyactis ciliata_ (Ledebour) Ledebour; _B. latissquamata_ (Maximowicz) Kitagawa; _Conyza altaica_ Candolle; _E. latissquamata_ Maximowicz.

Herbs, annual, 7–30 cm tall. Stems erect, usually branched from base, branches then decumbent, often reddish below, upper half and branches sparsely to moderately pilosulose, densely leafy. Leaves: basal petiolate, fallen at anthesis; cauline sessile, linear or linear-lanceolate, 2–6 × 0.3–0.6 cm, reduced in size upward, base subclasping, slightly decurrent, margin entire, sometimes serrulate, apex acute. Capitula disciform, numerous, in racemiform or paniculiform synflorescences, rarely solitary at ends of branches. Involucre campanulate; phyllaries 2- or 3-seriate, subequal or outer longer, linear, acute, outer leaflike, 3–6 × ca. 1 mm, margin ciliolate, margin of inner scarious below, leaflike above. Ray florets 75–95+ in 4 or 5 series, reduced to tube (sometimes with an extremely reduced lamina remnant, latter sometimes pinkish), 2–3 mm, apex sparsely hairy; disk florets white with pink-tipped lobes, 3.5–5 mm, limb narrowly funnelform, ca. 2 mm, lobes erect, triangular, 0.2–0.3 mm. Achenes purplish, narrowly obovoid, 1.5–2.5 mm, moderately strigillose, 2–4-veined. Pappus of many white, fine, barbellulate bristles, outer very short, inner 6–7 mm. Fl. and fr. Aug–Oct.

Salt marshes, meadows, damp riverbanks, marshes and lakes in plains and steppes, usually saline; 500–1500 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Xinjiang [Japan, Kazakhstan, Korea, Mongolia, Russia, Uzbekistan, Europe, North America].

This North American species crossed the Bering Sea during the Pleistocene.


钻叶紫菀 zuan ye zi wan

_Aster subulatus_ Michaux, Fl. Bor.-Amer. 2: 111. 1803.

Herbs, annual, 16–150 cm tall. Stems erect, sometimes purplish, glabrous, eglandular. Leaves: basal petiolate, lanceolate to ovate, usually fallen at anthesis; cauline petiolate to sessile, lanceolate to linear-lanceolate, 2–11 × 0.1–1.7 cm, slightly reducing in size upward, surfaces glabrous, eglandular, base attenuate to cuneate, margin serrulate to entire, eciliate, apex acute. Capitula radiate, numerous, in paniculiform synflorescences; peduncles 0.3–1 cm, glabrous, eglandular. Involucre cylindric; phyllaries 3–5-seriate, lanceolate to linear-lanceolate, glabrous, strongly unequal, outer 1–2 × ca. 0.2 mm, margin scarious, entire, scabrous, distally ciliate, eglandular, apex acute to acuminate. Ray florets numerous, in 1 series, lamina purplish blue, 1.5–2.5 mm, glabrous, eglandular; disk florets yellow, pinkish with age, 3–3.5 mm, limb 1.4–1.5 mm, lobes erect, triangular, 0.4–0.5 mm, glabrous, eglandular. Achenes lanceoloid, 1.5–2.5 mm, 2–6-veined, sparsely strigillose. Pappus of many white, fine, barbellulate bristles, 4–5 mm. Fl. and fr. Aug–Oct.

Disturbed areas, roadsides, grassy fields, irrigation ditches, rice field margins; near sea level to 2000 m. Introduced in Anhui, Fujian, Guangxi, Guizhou, Hebei, Henan, Hong Kong, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Africa, Central, North, and South America].
13. Tribe ATHROISMEAE

Annual or perennial herbs, shrubs, or small trees, sometimes aromatic. Leaves simple, alternate or fasciculate, petiolate or sessile, abaxial surface with or without sessile-glandular trichomes. Capitula terminal, in corymbose or solitary, sometimes congested, glomerule-like or in rounded secondary capitula, pedunculate, sometimes sessile, radiate, disciform, or disoid. Phyllaries 1–4-seriate, sometimes much reduced or absent, herbaceous, subequal or gradate. Receptacles convex to conical, sometimes subglobose to globose, paleate or epaleate. Ray florets when present female; corollas yellow or white. Anthers usually ecaulcarate, shortly caudate or not caudate, rarely tails well developed and branched; endothecium with polarized thickenings. Achenes brown or black, obcompressed to terete, sometimes with thickened striations or ribs, sometimes with apically arcuate twin trichomes. Pappus of awns or variously lacerate scales, a crown of twin trichomes, sometimes with 2 awns, or absent.

Six genera and ca. 59 species: mostly in E Africa, a few species in W Africa, S and SE Asia, and Madagascar; one species in China.


Herbs, annual or perennial. Stems not winged, without resin canals. Leaves simple, entire to dentate or pinnatifid or deeply lobed, hairy. Capitula large or small, solitary or clustered, heterogamous, radiate. Receptacle paleate; paleae folded. Marginal florets female, in ca. 1 row; corolla yellow, radiate; epidermis not crested. Disk florets bisexual; corolla yellow with straight epidermis cell walls, without needle-shaped crystals; corolla lobes short, smooth, without spiny hairs apically. Anthers minutely ecalcarate, with long or very short tails; endothecial tissue polarized; cells of antheropodium wider than long. Pollen spines with a cavity. Style with obtuse, rarely acute, sweeping hairs not reaching furcation, without star-shaped crystals. Achenes ellipsoid or with obtuse indistinct edges, without crystals in epidermis. Pappus of short acute or obtuse scales, or sometimes missing. \( x = 7 \).

About 40 species: mostly in S and tropical Africa, Madagascar; one species in China.

That Anisopappus is a member of the Athroismeae, the closest relatives of the Heliantheae s.l., has received robust support from DNA analyses (Eldenäs et al., Pl. Syst. Evol. 210: 159–170. 2005).


Herbs, annual. Rhizome stout, 5–12 mm in diam. Stems erect, 40–100 cm tall, 2–4–(–6) mm in diam., simple or rarely caespitose, subwoody at base, densely rusty pubescent or sparsely pubescent in lower part during anthesis. Cauline leaves ovate-lanceolate or narrowly oblanceolate, 3–6 × 1–2 cm, papery, both surfaces slightly pubescent, more densely so along veins, base truncate or broadly cuneate, margin obtusely serrate, apex obtuse. Capitula solitary or several in terminal corymbs; peduncles densely pubescent. Involucre hemispheric, 6–10 mm; phyllaries in 3 series, narrowly lanceolate or broadly linear, 3–5 × ca. 1.5 mm, dorsally densely pubescent, margin membranous, apex obtuse. Paleae keeled, membranous, ca. 5 mm. Marginal florets female; corolla yellow; lamina obtrian-gular, ca. 6.5 × 2 mm, apex truncate, 3-dentate. Disk florets bi-sexual; corolla tubular, ca. 3 mm, with short triangular lobes. Achenes columnar, sparsely pubescent, apex truncate, slightly narrower to base, ca. 2 mm in female florets and ca. 1.5 mm in bisexual florets, with 4 ribs. Pappus grayish white, chaffy, of 4 or 5 bristles. Fl. Aug–Nov.

Grassy slopes, waste fields, forest margins; below 2400 m. S Fujian, Guangdong, Guangxi, Sichuan, Yunnan [India, Myanmar, N Thailand; tropical Africa, Madagascar].

In the protologue of Anisopappus chinensis, Hooker and Arnott referred to “Verbesina chinensis Linn.” The expression of doubt in this citation prevented A. chinensis from being validly published as a new combination based on V. chinensis. The latter name was subsequently recognized as a heterotypic synonym of A. chinensis.
11. Tribe CALENDULEAE

金盏花族 jin zhan hua zu

Chen Yilin (陈艺林 Chen Yi-ling); Bertil Nordenstam

Herbs, shrubs, or subshrubs, annual or perennial. Leaves often alternate. Capitula radiate, heterogamous. Involucre campanulate, hemispheric, or rarely conic; phyllaries 1–3(or 4)-seriate, often with scarios margins. Receptacle flat or convex, naked. Ray florets female, fertile or sterile, tube short; lamina yellow, orange, or white, sometimes pink to purple or blue, apically 3-denticulate. Style linear, glabrous, style branches obtuse, rarely acute. Disk florets bisexual or male, actinomorphic, funnel-shaped, 5-lobed. Anthers caudate at base. Style simple or minutely bifid, rarely bifurcate, dorsally papillate or rarely hirsute. Corolla yellow or orange, rarely white. Achenes usually hard, thickened, sometimes with fleshy exocarp, terete, orbicular, obovate, or heteromorphic, curved or beaked. Pappus absent.

Twelve genera and ca. 120 species: mainly in S Africa, through tropical Africa to the Mediterranean, eastward to Iran; one species (introduced) in China.


金盏花属 jin zhan hua shu

Herbs, annual or perennial, sometimes suffrutescent, glandular pubescent. Leaves alternate, sessile, margin entire or repand-dentate. Capitula solitary, terminal. Involucre campanulate or hemispheric; phyllaries 1- or 2-seriate, lanceolate to linear-lanceolate, acuminate, with scarios margins. Receptacle flat or convex, glabrous, heterogamous. Ray florets female, 2- or 3-seriate, fertile; lamina apically 3-denticulate; style terete, 2-lobed. Disk florets bisexual, functionally male; corolla tubular–funnel-shaped. Style undivided, apically thickened or globose. Achenes polymorphic; outer cymbiform, somewhat curved, rostrate, or triquetro; inner distinctly curved, sometimes winged, all dorsally rugose to tuberculate-aculeate. \( x = 7, 8, 9, 11, 15 \).

About 15 or 20 species: mainly in SW Asia, W Europe, Macaronesia, and Mediterranean region; one species (introduced) in China.


金盏菊 jin zhan ju

Herbs, annual, 20–75 cm tall, usually branched from base, green, ± glandular pubescent. Basal leaves oblong-obovate or spatulate, 15–20 cm, margin entire or remotely denticulate; stem leaves oblong, oblong-lanceolate, or oblong-ovate, 5–15 × 1–3 cm, ± amplexicaul, margin inconspicuously repand-denticulate, apex obtuse, rarely acute. Capitula 4–5 cm in diam.; phyllaries lanceolate or oblong-lanceolate, outer slightly longer than inner, acuminate. Ray florets yellow or orange, ca. 2 × as long as involucre, lamina up to 4–5 mm wide. Disk florets with triangular-lanceolate lobes. Achenes curved, yellowish or brownish, outer half-curved, often aculeate rostrate at apex, lateral-winged ridge irregularly rugose. Fl. Apr–Sep, fr. Jun–Oct.

Cultivated as an ornamental in parks and gardens of China [native origin unknown].
4. Tribe CARDUEAE

飞廉族 fei lian zu

Shi Zhu (石铸 Shih Chu); Eckhard von Raab-Straube, Werner Greuter, Ludwig Martins

Herbs, annual to perennial. Leaves alternate, sometimes all basal. Capitula homogamous or heterogamous, bisexual, sometimes unisexual in dioecious plants, persistent or deciduous, solitary or clustered at end of stem and branches, sometimes surrounded by ± leaflike spiny bracts. Phyllaries imbricate, undivided. Receptacle densely covered with bristles, rarely with short scales, or naked. Florets few to numerous. Corolla usually actinomorphic or slightly zygomorphic, equally or unequally 5-lobed or sometimes strongly zygomorphic in radiant florets of heterogamous capitula. Stamen filaments glabrous, papillose, or hairy; anther sagittate, base caudate; connective with a sterile apical appendage. Style branches distinct and divergent or coherent medially for most of their length and only seceding along stigmatic margins; sweeping hairs usually confined to a ringlike sometimes swollen zone at base of style branches or longest there and distally abruptly shorter. Achene usually glabrous, rarely ± hairy, apex with a peripheral rim surrounding an apical plate on which pappus is inserted; rim sometimes salient as an entire or dentate crown, sometimes inconspicuous.

About 75 genera and ca. 2,400 species: E and N Africa, Asia, Australia, Europe, North and South America; 37 genera (four endemic, three introduced) and 440 species (237 endemic, five introduced) in China.

1a. Achene attachment scar ± basal; capitula always homogamous and mostly with radiant outer florets ......................................................................................................................... 5. Subtribe Centaureinae
1b. Achene attachment scar lateral or subbasal and oblique; capitula homogamous or heterogamous and mostly with radiant outer florets ................................................................................................................................. 1. Saussurea group

2a. Leaf margin unarmed, entire or with blunt to mucronulate non-pungent teeth, apex of phyllaries sometimes recurved but never hooked ................................................................................................................................. 1. Saussurea group
2b. Leaf margin spiny or spinulose, or if ± entire then apex of phyllaries hooked.

3a. Pappus of distinct scabrid bristles falling off singly or (rarely) pappus absent; style branches distinct and divergent ................................................................................................................................................................. 2. Arctium group
3b. Pappus of scabrid to plumose bristles (rarely scales) basally connate into a ring and falling off together; style branches coherent for most of their length.

4a. Achene with apical rim either inconspicuous or forming a conspicuous and crenulate (rarely entire) crown, apical plate lacking an elaiosome .................................................................................................................................................................................. 3. Onopordum group
4b. Achene with apical rim forming a smooth-margined upright crown, apical plate with a prominent oleaginous central umbo (elaiosome) ....................................................................................................................................................... 4. Subtribe Carduinae

1. SAUSSUREA group

风毛菊群 feng mao ju qun

Shi Zhu (石铸 Shih Chu); Eckhard von Raab-Straube

Cauliferous herbs, stemless rosette herbs, or subshrubs, biennial, perennial, or rarely annual. Leaves without spines; leaf blade undivided to pinnatisect, margin entire or with blunt to mucronulate non-pungent teeth. Capitula homogamous, bisexual. Phyllaries in several rows, without spines, apically sometimes with a green or purplish membranous or herbaceous appendage or mucronate. Receptacle densely covered with long subulate bristles, short scales, apiculate papillae, or naked and alveolate. Florets bisexual, all fertile. Corolla ± actinomorphic. Filaments distinct, glabrous. Style branches usually distinct and divergent, rarely partly coherent. Achene usually glabrous, sometimes glandular, rarely pubescent or papillose, apical rim inconspicuous or forming a ± developed crenulate or denticulate crown. Pappus homomorphic or heteromorphic, in 1 to several distinct or connate rows of scabrid to plumose bristles or rarely of small scales; inner pappus long, usually overtopping involucre.

About 15 genera and ca. 700 species: NW Africa, Asia, Europe, North America; nine genera (two endemic, one introduced) and 323 species (205 endemic, one introduced) in China.

1a. Plants annual; outer pappus an incomplete row of small scales and inner pappus a ring of plumose bristles .......... 21. Hemisteptia
1b. Plants perennial or biennial; pappus of only bristles.

2a. Pappus bristles in several rows, of different length, usually scabrid or barbellate, rarely plumose; receptacle with short scales or naked and alveolate, rarely with bristles.

3a. Pappus bristles silvery, dirty white, or white, inserted on a conic cupule, 0.5–1.5 cm; receptacle with short scales or bristles .................................................................................................................................................................................................................. 14. Jurinea
3b. Pappus bristles dirty white, yellowish, brown, or reddish, not inserted on a conic cupule, 1.5–4 cm; receptacle either alveolate or with long bristles.

4a. Capitula several and clustered or solitary in center of leaf rosette; phyllaries not densely lanate; receptacle alveolate, naked or with very short apiculate papillae, without bristles ................................................................................................................................................................................................. 17. Dolomiaeae
4b. Capitulum solitary on a subscapose stem; phyllaries densely lanate; receptacle with long bristles .............................................................................................................................................................................................................................. 18. Boloecephalus
2b. Pappus bristles in 1 or 2 rows, with bristles of inner row of same length and always plumose; receptacle usually with ± long, subulate bristles, sometimes naked and alveolate, or with short apiculate papillae.

5a. Pappus in 2 rows; achene smooth, ribbed, or sometimes wrinkled, apical rim inconspicuous or rarely with a short crown.

6a. Outer pappus a row of scabrid or rarely plumose caducous bristles (rarely lacking), inner pappus a ring of plumose bristles ................................................................. 22. Saussurea

6b. Outer and inner pappus bristles both plumose and connate with each other into a ring ......................... 15. Diplazoptilon

5b. Pappus in 1 row; achene wrinkled or muricate, apical rim always forming a distinct crown.

7a. Corolla limb with sessile glands; achene blackish, 2–5 mm, with a dentate crown .................................... 16. Himalaiella

7b. Corolla limb glabrous; achene straw-colored or brown with black spots, 5–8 mm, with a crenulate crown.

8a. Capitulum solitary, long pedunculate; petiole of basal leaves unwinged ............................................... 19. Frolovia

8b. Capitula 2–7 and clustered, sessile or subsessile; petiole of basal leaves with a broad lobed wing ................................................................................................................................. 20. Aucklandia


苓菊属 ling ju shu

Shi Zhu (石铸 Shih Chu); Eckhard von Raab-Straube

*Pilostemon* Iljin.

Herbs, perennial [or shrublets]. Leaves undivided to pinnatisect. Capitula solitary or several in a corymbiform synflorescence. involucre bowl-shaped, ovoid, campanulate, hemispheric, or cylindric. Phyllaries herbaceous or leathery, appressed or reflexed. Receptacle with broad rigid shortly acuminate scales or bristles. Corolla red to purple, with sessile glands. Anther tails lanceolate-caudate. Style branches short, divergent. Achene isodiametric, narrowly obovoid, narrowly ellipsoid, or obconic, 3- or 4-angled, glabrous or glandular, sometimes spinulose-tuberulate, apical rim forming a crown. Pappus bristles in several rows, white, scabrid, barbellate, or plumose, unequal in length, sometimes 2–5 inner bristles much longer than others; bristles inserted on a conspicuous conical cupule, persistent or caducous as a whole.

About 250 species: NW Africa, C and SW Asia, Europe; ten species (one endemic) in China.

The genus *Pilostemon* differs from *Jurinea* only in the pilose anther connectives. All other diagnostic characters given in the protologue of the genus, especially concerning the receptacle, achene, and pappus structure, can be found at least in some sections of *Jurinea* as well. *Pilostemon* is therefore not accepted in this treatment.

1a. Achene not spinulose-tuberulate.

2a. Leaf blade linear-filiform, 1–2 mm wide; involucre obconic; pappus plumose, 1–1.5 cm ......................... 3. *J. filifolia*

2b. Leaf blade broadly linear to elliptic, more than 3 mm wide; involucre cylindric or bowl-shaped; pappus scabrid or barbellate, 0.8–1.2 cm.

3a. Leaf blade broadly linear, abaxially grayish white, adaxially green, undivided; involucre cylindric; phyllaries scariosi .................................................................................................................. 1. *J. multiflora*

3b. Leaf blade elliptic, obovate, or ovate, green to grayish green, almost concolorous, pinnately dentate, pinnately lobed, or pinnately divided; involucre bowl-shaped; phyllaries leathery .................................................. 2. *J. mongolica*

1b. Achene spinulose-tuberulate.

4a. Pappus elements not connate into a ring, persistent.

5a. Outer and middle phyllaries with reflexed or slightly bent apex ......................................................... 6. *J. dshungarica*

5b. Outer and middle phyllaries straight, appressed, apex not reflected.

6a. Involucre cylindric, 1.2–1.5 cm in diam.; leaf blade grayish green, almost concolorous, arachnoid floccose ................................................................. 4. *J. adenocarpa*

6b. Involucre bowl-shaped, 2–3 cm in diam.; leaf blade abaxially grayish white and densely tomentose, adaxially green to pale green and glabrous or sparsely arachnoid tomentose ........................................... 5. *J. lanipes*

4b. Pappus elements basally connate into a ring, caducus.

7a. Phyllaries straight, appressed, apex not reflexed ..................................................................................... 7. *J. lipskyi*

7b. Outer and middle phyllaries with reflexed to patent apex.

8a. Herbs (10–)20–45 cm tall; leaf blade of rosette leaves 4–11 × 1–3 cm, green to grayish white, almost concolorous ........................................................................................................ 10. *J. chaetocarpa*

8b. Herbs stemless or with shorter stems 2–10(–20) cm tall; leaf blade of rosette leaves 2–4 × 0.3–1 cm, abaxially grayish white, adaxially green.

9a. Herbs stemless or shortly stemmed, to 10 cm tall; leaf blade of rosette leaves lyrate- pinnatifid, lyrate-pinnatisect, or pinnately divided, usually some undivided; outer phyllaries sparsely arachnoid, glabrescent, 5–15 mm ................................................................. 8. *J. algida*
9b. Herbs with developed stems, 7–18 cm tall; leaf blade of rosette leaves pinnately dentate to pinnately lobed; outer phyllaries densely arachnoid, 2–5 mm ...................................................... 9. \textit{J. kaschgarica}


多花苓菊 duo hua ling ju


Herbs 10–20[−50] cm tall, perennial. Caudex long, slender, usually branched. Stems several or solitary, erect, apically branched. Basal and lower stem leaves shortly petiolate; leaf blade abaxially grayish white, densely tomentose, and gland-dotted, adaxially green and glabrous or ± gland-dotted, margin entire and revolute, apex acute. Middle stem leaves sessile; leaf blade linear to broadly linear, 4–8[−15] × 0.3–0.6[−1] cm, base semiamplexicaul. Bracts linear-subsulate, smaller than lower stem leaves. Capitulum many, in a terminal corymbose synflorescence. Involucre cylindric, 3–5 mm in diam. Phyllaries in 5 or 6 rows, scarious, appressed, glabrous or sparsely arachnoid pubescent, gland-dotted; outer phyllaries broadly to narrowly triangular, 3–5 × 1–2.5 mm; middle phyllaries elliptic to narrowly elliptic, 5–9 × 2–2.5 mm; inner phyllaries linear, 9–12 × 1–1.5 mm. Corolla pink to purple, 1.3–1.7 cm, tube 5–7.5 mm, limb 8–9 mm, lobes 4–5 mm. Achene brown to pale red, obconic, 3.5–5 mm, 4-ribbed, glabrous. Pappus bristles white, scabrid, 8–10 mm, not coniate into a ring, persistent. Fl. Jun–Aug, fr. Jul–Sep.

Forests, saline steppes, meadows, wastelands, fields; 1800–2000 m. NW Xinjiang [Kazakhstan, Mongolia, Russia; E Europe].


蒙疆苓菊 meng jiang ling ju

Herbs 6–25 cm tall, perennial. Caudex stout, branched, apically covered with remains of petioles, densely white lanate. Stems erect, branched from base. Basal leaves petiolate; petiole 2–4 cm, base densely lanate; leaf blade elliptic to narrowly ovate-elliptic, 2–7 × 0.5–1.5 cm, pinnately divided, pinnately lobed, or pinnately dentate, green to grayish green, almost concolorous, glabrous or sparsely arachnoid, margin entire and revolute; lateral lobes 3 or 4 pairs, narrowly elliptic to narrowly triangular-ovate; terminal lobe narrowly ovate-elliptic, longer than lateral ones. Stem leaves sessile, similar to basal leaves or undivided. Capitulum solitary at end of branches. Involucre bowl-shaped, 1.5–2.5 cm in diam. Phyllaries in 4–6 rows, leathery, appressed, glandular, apex acuminate; outer phyllaries narrowly triangular, 4–6 × 1.5–2.5 mm; middle phyllaries narrowly triangular-subulate, 7–11 × 1.5–2.5 mm; inner phyllaries linear, 15–20 × 2–3 mm. Corolla red, 2–2.5 cm, gland-dotted, tube 6–9 mm, limb 1.4–1.6 cm, lobes 5–7 mm. Achene brown, obconic, 4–6 mm, apically sparsely gland-dotted. Pappus bristles dirty white, barbellate, 5–12 mm, with 2–4 of inner ones much longer than others, not coniate into a ring, persistent. Fl. Jun–Jul, fr. Jul–Aug.

Desert steppes; 1000–1500 m. Nei Mongol, Ningxia, Shaanxi, Xinjiang [Mongolia].


毛蕊苓菊 mao rui ling ju


Herbs 25–70 cm tall, perennial. Stems solitary or few, grayish green, erect, virgately branched from base. Leaves sessile, linear to filiform, 1–7[−10] × 0.1–0.2 cm, abaxially grayish white and densely arachnoid tomentose, adaxially green and glabrous, margin revolute, apex acute. Capitulum solitary at end of branches. Involucre obconic, 1–2 cm in diam. Phyllaries in 5–8 rows, purplish red, appressed, tomentose, apex not reflexed, acuminate, and cartilaginous; outer phyllaries narrowly ovate-elliptic, 3–5 × 1–1.5 mm; middle phyllaries narrowly ovate to narrowly elliptic, 5–13 × 1.5–2 mm; inner phyllaries broadly linear, ca. 14 × 1.5 mm. Corolla purplish red, 1.5–2 cm, tube 7–9 mm, limb 6–7 mm, lobes 3–4 mm. Anther connectives with few very fine long unicellular hairs. Achene blackish brown, obconic, 3–5 mm, apically densely glandular and with a dentate crown. Pappus bristles white or dirty white, plumose, 1–1.5 cm, not coniate into a ring, persistent. Fl. Jul–Aug, fr. Aug–Oct.

Gravelly riversides, moist gorges, sandy places; 700–1000 m. C Xinjiang [Kazakhstan].

\textit{Jurinea pilostemonoides} does not differ from \textit{J. filifolia}, except by the glabrous anther connectives, which, however, can be glabrescent in \textit{J. filifolia} as well.

\textit{Jurinea karategina} (Lipsky) O. Fedtschenko, described from Tajikistan and also treated as \textit{Pilostemon karateginus} (Lipsky) Iljin, is said to occur in Xinjiang as well (G. M. Shen, Fl. Xinjiang. 5: 258. 1999; Iljin, Fl. URSS 27: 711. 1962), but no specimens from China are known. It differs from \textit{J. filifolia} by its broader, elliptic or oblong leaves, to ca. 10 × 1.5 cm, and by its smaller florets, with a corolla of 1–1.3 cm.


腺果苓菊 xian guo ling ju

Herbs 15–40 cm tall, perennial. Caudex stout, branched, apically lanate tomentose. Stems several, erect, divaricately branched in apical half. Lower and middle stem leaves shortly petiolate; leaf blade elliptic, 5–10 × 1–2 cm, pinnately lobed or pinnately divided, both surfaces grayish green and arachnoid floccose; segments narrowly elliptic to linear, margin sinuate. Upper stem leaves sessile, elliptic to linear, gradually smaller upward on stem, undivided. Capitulum solitary at end of branches. Involucre cylindric, 0.8–1.2–1.5 cm in diam. Phyllaries in 6 rows, appressed, sparsely arachnoid floccose; outer phyllaries ovate, ca. 3 × 1 mm, apex acute; middle phyllaries narrowly ovate, 5–7 × 1–2 mm, apex spiniform-acuminate; inner phyllaries narrowly ovate, 10–14 × 2–3 mm, apex long acuminate. Corolla purple, 1–1.4 cm, tube 3.5–7.5 mm.
Herbs 10–40–(60) cm tall, perennial. Caudex stout, apically covered with remains of petioles. Stems solitary or few, erect, simple or branched from base. Basal leaves petiolate; petiole 1.5–4(–8) cm, base adaxially densely lanate; leaf blade elliptic, 5–7(–12) × 1–2.5 cm, pinnately lobed to undivided, abaxially grayish white and densely tomentose, adaxially grayish green, arachnoid, and gland-dotted; lateral lobes 4–7 pairs, ovate, elliptic, or broadly triangular, margin entire or dentate, apex rounded to acute. Stem leaves few, similar to basal leaves, gradually smaller upward on stem. Caudex solitary at end of branches. Involucre bowl-shaped, 1.5–2 cm in diam. Phyllaries in ca. 5 rows, yellowish green, arachnoid; outer and middle phyllaries narrowly triangular-ovate to narrowly elliptic, 3–10 × 1–3 mm, apex spiniform-acuminate and reflexed; inner phyllaries elliptic to elliptic-linear, 8–14 × 1–2 mm, apex acuminate and not reflexed. Corolla reddish purple, 1.4–1.9 cm, tube 4–7 mm, limb 1–1.2 cm, lobes 4–6 mm. Achene obconic, 5–6 mm, apically spinulose-tuberculate. Pappus bristles white, barbellate, 0.8–1.2 cm, with 2 of inner ones much longer than others, not connate into a ring, persistent. Fl. May–Aug, fr. Jun–Jul.

Montane steppes and meadows; ca. 1900 m. NW Xinjiang (Zhaosu) [Kazakhstan].

“Jurinea suidunensis” belongs here, but, to our knowledge, has never been validated by a description or diagnosis. When regarded as conspecific with J. *dshunagara* (e.g., by Tscherneva, Bot. Zhurn. 86 (12): 88–89, 2001), a concept which is followed here, the latter name has to be adopted as the correct one for this taxon.


**Jurinea flavicida** C. Shih.

Herbs 15–50 cm tall, perennial. Caudex stout, apically covered with remains of petioles, densely lanate. Stems solitary or several, erect, simple or branched from base. Basal leaves petiolate; petiole 4–6 cm; leaf blade narrowly obovate to elliptic, 5–10 × 2–3 cm, lyrate, pinnately lobed, abaxially grayish white and densely tomentose, adaxially green and glabrous or sparsely arachnoid and gland-dotted; lateral lobes 3–10 pairs, ovate to elliptic, margin entire, apex obtuse to rarely acute; terminal lobe larger than lateral ones. Lower and middle stem leaves few, shortly petiolate to sessile, similar to basal leaves. Uppermost stem leaves linear, usually undivided. Caudex solitary at end of branches. Involucre bowl-shaped, 2–3 cm in diam. Phyllaries in ca. 6 rows, appressed, sparsely arachnoid, gland-dotted, apex spinulose-elliptic; outer phyllaries triangular, 6–10 × 1–2 mm; middle and inner phyllaries narrowly triangular-ovate, 10–18 × 1–2 mm. Corolla reddish purple, 1.6–1.7 cm, tube 4–7 mm, limb 1–1.2 cm, lobes ca. 5 mm. Achene cylindric-obconic, 5–6 mm, apically spinulose-tuberculate. Pappus bristles white, barbellate, 0.8–1.2 cm, with 1 or 2 of inner ones much longer than others, not connate into ring, persistent. Fl. May–Aug, fr. Jun–Sep.

Alpine and subalpine forest meadows, steppes, wastelands, roadsides; 1200–2900 m. NW Xinjiang (Zhaosu) [Kazakhstan, Kyrgyzstan, Tajikistan].


Herbs 10–40–(60) cm tall, perennial. Caudex stout, apically covered with remains of petioles. Stems solitary or few, erect, simple or branched from base. Basal leaves petiolate; petiole 1.5–2 cm; leaf blade elliptic to narrowly ovate, 2.4–1.5–2 cm, pinnately lobed, abaxially grayish white and sparsely tomentose, adaxially green to grayish green and glabrous or sparsely arachnoid; lateral lobes 3 or 4 pairs, narrowly elliptic to narrowly triangular-ovate, margin undulate or serrulate, apex obtuse. Stem leaves few, gradually smaller upward on stem; lower stem leaves similar to basal leaves; upper stem leaves linear to subulate. Caudex solitary at end of branches. Involucre bowl-shaped, 1.5–2 cm in diam. Phyllaries in ca. 4 rows, appressed, glabrous or sparsely arachnoid, apex acute to acuminate; outer phyllaries narrowly triangular-ovate, 4–6 × 2–3 mm; middle and inner phyllaries narrowly ovate-elliptic to linear, 10–15 × 3–4 mm. Corolla purple, ca. 1.5 cm, tube 4.5–5.5 mm, limb ca. 1 cm, lobes 4–5 mm. Achene obconic, 6–7 mm, gland-dotted, apically spinulose-tuberculate. Pappus bristles white, scabrid to barbellate, to 9 mm, with 2 of inner ones much longer than others, basally connate into a ring, caducous. Fl. May–Jun, fr. Jun–Jul.

Montane steppes and meadows; ca. 1900 m. NW Xinjiang (Zhaosu) [Kazakhstan].

**Jurinea baicalica** C. Shih.

Herbs 35–50 cm tall, perennial. Stems solitary or few, erect, simple or branched from base. Basal leaves petiolate; petiole 1–2 cm; leaf blade elliptic to narrowly ovate, 2.4–1.5–2 cm, pinnately lobed, abaxially grayish white and sparsely tomentose, adaxially green to grayish green and glabrous or sparsely arachnoid; lateral lobes 3 or 4 pairs, narrowly elliptic to narrowly triangular-ovate, margin undulate or serrulate, apex obtuse. Stem leaves few, gradually smaller upward on stem; lower stem leaves similar to basal leaves; upper stem leaves linear to subulate. Caudex solitary at end of branches. Involucre bowl-shaped, 1.5–2 cm in diam. Phyllaries in ca. 4 rows, appressed, glabrous or sparsely arachnoid, apex acute to acuminate; outer phyllaries narrowly triangular-ovate, 4–6 × 2–3 mm; middle and inner phyllaries narrowly ovate-elliptic to linear, 10–15 × 3–4 mm. Corolla purple, ca. 1.5 cm, tube 4.5–5.5 mm, limb ca. 1 cm, lobes 4–5 mm. Achene obconic, 6–7 mm, gland-dotted, apically spinulose-tuberculate. Pappus bristles white, scabrid to barbellate, to 9 mm, with 2 of inner ones much longer than others, basally connate into a ring, caducous. Fl. May–Jun, fr. Jun–Jul.

Montane steppes and meadows; ca. 1900 m. NW Xinjiang (Zhaosu) [Kazakhstan].

**Jurinea ruprechtiana** C. Shih.

Herbs 2–10 cm tall, perennial, stemless or shortly stemmed. Caudex simple or branched, covered with remains of petioles. Rosette leaves petiolate; petiole 1.5–3 cm, base adaxially lanate; leaf blade elliptic to narrowly ovate, 2.5–4 × 0.5–1 cm, lyrate, pinnately lobed to divided or pinnately divided, abaxially grayish white and densely tomentose, adaxially green, sparsely arachnoid, and gland-dotted but glabrescent; lateral lobes 2–4 pairs, narrowly ovate, elliptic, or obliquely triangular, margin revolute and entire or sinuously dentate, apex obtuse to rounded; terminal lobe usually larger than lateral ones. Caudex solitary, in center of leaf rosette or terminal on...
stem. Involucre bowl-shaped, 1.5–2.5 cm in diam. Phyllaries in 3–5 rows, sparsely arachnoid tomentose; outer and middle phyllaries narrowly triangular-ovate, 5–15 × 1–3 mm, apex spiniform-acuminate and reflexed; inner phyllaries narrowly triangular-ovate to linear, 10–14 × 1–3 mm, apex acuminately and not reflexed. Corolla purplish red, 1.4–2 cm, tube 6–8.5 mm, limb 8–10 mm, lobes 3.5–5 mm. Achene brown, narrowly elliptoid, 4–7 mm, glabrous, apically spinulose-tuberculate. Pappus bristles white, scabrid to barbellate, 1.2–1.6 cm, with 3 or 4 of inner ones much longer than others, basally connate into a ring, caducous. Fl. Jul–Sep, fr. Aug–Sep.

Subalpine and alpine scree slopes; 2800–3100 m. W Xinjiang (Wuqia). *Jurinea pamirica* does not differ from *J. algida*, except for the stronger branched caudex, which leads to a more densely caespitose or even pulvinate habit. Leaf division is quite variable in *J. algida* so that this character cannot be used to separate *J. pamirica* from it.


南疆苓菊 nan jiang ling ju

Herbs 7–18 cm tall, perennial. Caudex stout, simple or few branched, covered with remains of petioles. Stems solitary or several, erect or ascending, simple. Rosette leaves petiolate; petiole 5–10 mm; leaf blade linear-elliptic to narrowly obovate, 1.5–4 × 0.3–1 cm, pinnately lobed or pinnately dentate, abaxially grayish white and densely tomentose, adaxially green and densely spinulose-tuberculate. Pappus bristles white, barbellate, 1.2–11 mm, with 2–5 of inner ones much longer than others, basally connate into a ring, caducous. Fl. and fr. Jun.

- Scree slopes, gullies; ca. 2300 m. W Xinjiang (Wuqia).

*Jurinea kaschgarica* is closely related to and possibly not clearly separable from *J. algida*.


刺果苓菊 ci guo ling ju

*Serratula chaetocarpa* Ledebour, Fl. Altaic. 4: 42. 1833; *Jurinea scapiformis* C. Shih.

Herbs 10–45 cm tall, perennial. Caudex apically covered with remains of petioles, densely lanate. Stems usually several or rarely solitary, erect, simple or few branched. Rosette leaves petiolate; petiole to 9 cm; leaf blade elliptic, 4–11 × 1–3 cm, pinnately lobed, green to grayish white, almost concolorous, glabrous to densely arachnoid tomentose; lobes 4–6 pairs, narrowly elliptic, narrowly ovate, or obliquely triangular, margin entire or sinuate, apex acute to acuminate; terminal lobe narrowly ovate-elliptic, longer than lateral ones. Stem leaves few or absent, similar to rosette leaves but sessile and sometimes linear-subulate and undivided. Capitulum solitary at end of branches. Involucre bowl-shaped, 1.5–2 cm in diam. Phyllaries in 4 or 5 rows, narrowly triangular-ovate to linear-subulate, apex spiniform-acuminate; outer and middle phyllaries 6–11 × 2–3 mm, apex reflexed to patent; inner phyllaries 1.4–2 × 0.3–0.4 cm. Corolla purplish red, 1.2–1.5 cm, tube ca. 4 mm, limb ca. 9 mm, lobes 3–4 mm. Achene ellipsoid-obconic, 4–6 mm, densely spinulose-tuberculate. Pappus bristles white, barbellate, 7.5–10 mm, with 1 or 2 of inner ones much longer than others, basally connate into a ring, caducous. Fl. May–Jun, fr. Jun–Jul.

Gravelly deserts, saline and sandy steppes; 500–2000 m. N Xinjiang [Kazakhstan, W Mongolia].


重羽菊属 chong yu ju shu

Shi Zhu (石铸 Shih Chu); Eckhard von Raab-Straube


- One species: China.


重羽菊 chong yu ju


Herbs 3–9 cm tall, perennial, stemless or rarely shortly stemmed. Caudex to 1.2 cm in diam., simple, densely covered with remains of petioles. Stem (if present) solitary, ca. 3 mm in diam., erect, simple. Rosette leaves petiolate; petiole 0.5–2 cm; leaf blade elliptic, narrowly ovate, or narrowly obovate, 8–15(–27) × 1.5–5 cm, both surfaces green, abaxially glabrous, adaxially sparsely strigose, base attenuate, margin entire or sparsely dentate with mucronulate teeth, apex acute to obtuse and mucronulate. Capitulum solitary in center of leaf rosette.
Involucre campanulate, 2.5–3.5 cm in diam. Phyllaries in 4 or 5 rows, apex acuminate; outer and middle phyllaries triangular-ovate, 1.5–2 × 0.4–0.5 cm; inner phyllaries narrowly ovate, elliptic, or linear, 2.5–3 × 0.2–0.4 cm. Corolla 2.5–2.7 cm, tube 1.5–1.7 cm, limb ca. 1 cm, lobes ca. 5 mm. Achene 5–6 mm. Pappus bristles pale brown, 2–2.3 cm. Fl. and fr. Aug–Sep.

- Alpine grasslands, mountain slopes; 3600–3800 m. SE Xizang, NW Yunnan.


须弥菊属 xu mi ju shu

Shi Zhu (石铸 Shih Chu); Eckhard von Raab-Straube


Herbs, biennial or perennial, tall or rarely stemless. Stems usually densely leafy or rarely scapiform. Basal leaves often pinnately divided. Capitulum solitary and terminal on stem or in a racemiform, paniculiform, or corymbose synflorescence, often nodding or sometimes erect, sessile or pedunculate. Involucrum hemispheric to campanulate. Phyllaries sometimes reflexed. Receptacle densely covered with subulate alveolate bristles and rarely also with subulate paleae. Corolla reddish purple, purple, pink, or white, gland-dotted. Anther tails moderately lacerate. Achene blackish, 2–5.5 mm, 4- or 5-angled, glabrous, wrinkled, squamulate, or muricate, apical rim forming a conspicuous crown. Pappus homomorphic, in 1 row; bristles snow white, dirty white, or brownish, plumeose, basally connate into a ring, caducous as a whole.

Thirteen species: Afghanistan, Bhutan, China, N India, Kashmir, Laos, Myanmar, Nepal, Pakistan, N Thailand, N Vietnam; SW Asia (Iran); seven species (one endemic) in China.

In C. Shih and S. Y. Jin (FRPS 78(2): 57–66, 1999), most species of Himalaiella are included in Saassurea subg. Frolovia (Candolle) Lipschitz. They are, however, more closely related to Jurinea than to Saussurea.

1a. Leaf blade of basal and lower stem leaves pinnately or bipinnately divided, terminal lobe not much larger than lateral ones.

2a. Plants almost stemless; capitula few, clustered in center of leaf rosette ................................................................. 1. H. yakla

2b. Plants with tall stems; capitula many, in a racemiform or paniculiform synflorescence ........................................... 7. H. peguensis

1b. Leaf blade of basal and lower stem leaves lyrate pinnately or bipinnately divided, terminal lobe much larger than lateral ones or blade undivided.

3a. Stem simple, scapiform with reduced leaves; capitulum always solitary; leaf blade adaxially grayish green, arachnoid tomentose ........................................................................................................................................... 2. H. abnormis

3b. Stem branched or rarely simple, leafy, not scapiform; capitula numerous or solitary; leaf blade adaxially green, scabrous, strigose, or glabrescent.

4a. Receptacle with bristles and long subulate paleae; pappus brown ................................................................. 3. H. auriculata

4b. Receptacle with bristles but without paleae; pappus white or straw-colored.

5a. Plants few branched, with 2–4 capitula; outer phyllaries without appendage, long acuminate ........ 4. H. qinghaiensis

5b. Plants usually much branched, capitula numerous; outer phyllaries with a green, herbaceous appendage.

6a. Involucre 1–2 cm in diam.; capitula solitary or clustered, sub sessile or shortly pedunculate; corolla 1.1–2.2 cm; pappus 0.8–1 cm .............................................................. 6. H. nivea

6b. Involucre 2–4 cm in diam.; capitula mostly solitary, long pedunculate; corolla 1.5–2 cm; pappus 1.4–1.6 cm ........................................................................ 5. H. deltoidea


亚东须弥菊 ya dong xu mi ju

Saussurea yakla C. B. Clarke, Compos. Ind. 227. 1876; Diplazoptilon cooperi (J. Anthony) C. Shih; Dolomiaeae cooperi (J. Anthony) Y. Ling; Jurinea cooperi J. Anthony.

Herbs, perennial, stemless or shortly stemmed. Rosette leaves petiolate; petiole 2–6[–10] cm; leaf blade ovate, elliptic, or oblong in outline, 5–40 × 3–8 cm, bipinnately lobed to bipinnately divided, abaxially white with distinct dark veins, arachnoid tomentose, and glandular, adaxially green, puberulent, and sparsely glandular, segments 5–10 pairs, triangular, ovate, or oblong, 1–3.3 × 0.8–3.4 cm, margin dentate and mucronate, apex acute or obtuse and mucronate. Capitula (1–)3–8–(10), in a condensed corymbose synflorescence in center of leaf rosette, sessile or sub sessile. Involucre campanulate, 0.8–3 cm in diam. Phyllaries in 4–6 rows, light brown, green, or reddish, apex erect or reflexed; outer phyllaries narrowly triangular-ovate, 5–10 × 2–4 mm, apex acute; middle phyllaries narrowly ovate-elliptic, 10–18 × 2–4 mm; inner phyllaries narrowly elliptic to linear, 1.8–3 × 0.1–0.3 cm, apex obtuse. Receptacle bristles 3–5 mm. Corolla purple, 1.7–2.7 cm, tube 1.3–1.5 cm, limb ca. 5 mm, lobes 4–6 mm. Achene 2.5–5.5 mm, 4- or 5-angled, muricate, apex with a dentate crown. Pappus bristles dirty white to light brown, 1.6–2.5 cm. Fl. and fr. Aug–Nov. 2n = 34.
Alpine meadows, grasslands; ca. 4100 m. S Xizang (Yadong) [Bhutan, India (Sikkim), Nepal].


白背须弥菊  bai bei xu mi ju

Aplotaxis auriculata Candolle, Prodr. 6: 541. 1838; Saussurea auriculata (Candolle) Schultz Bipontinus; S. hypoleuca Sprengel ex C. B. Clarke, nom. illeg. superfl.

Herbs 0.4–1.5 m tall, perennial. Stem solitary, 2–5 mm in diam., erect, simple or few branched. Basal to middle stem leaves sessile, obovate, 8–22 × 2.5–10 cm, lyrate pinnately parted, abaxially grayish green and sparsely arachnoid tomentose, adaxially black when dry and puberulent, base auriculate and amplexicaul; lateral lobes 1–3 pairs, obliquely triangular; terminal lobe triangular, large, margin dentate, apex acute. Upper stem leaves usually shortly petiolate; leaf blade narrowly ovate to elliptic, 3–11 × 0.5–5 cm, undivided. Capitula solitary or few, terminal on stems and branches, nodding at anthesis. Involucrre broadly campanulate, 2–3 cm in diam. Phyllaries in ca. 5 rows, sparsely pubescent, margin ciliate, apex long acuminate; outer phyllaries narrowly triangular, 8–14 × 1.5–2.5 mm; middle and inner phyllaries narrowly triangular to linear, 12–17 × 1–2 mm. Receptacle bristles 2–5 mm; paleaee yellowish brown, subulate, 1.2–1.5 cm, ciliate in distal half. Corolla dark purple, 8–10 mm, tube 3–5 mm, limb 4–6 mm, lobes 1.5–2(–3) mm. Achenes blackish brown, cylindrical, 3–3.5 mm, 4- or 5-ribbed, apically spinulose, apex with a denticate crown. Pappus bristles brown, 7–10 mm. Fl. and fr. Aug–Sep. 2n = 58.

Mixed forests; 2700–4000 m. S Xizang [Bhutan, N India, Kashmir, Nepal].


青背须弥菊  qing hai xu mi ju

Saussurea hypoleuca is illegitimate because C. B. Clarke, in the protologue, cited the validly published earlier name Aplotaxis auriculata in synonymy.


青海须弥菊  qing hai xu mi ju


Herbs, 80–90 cm tall, perennial. Stem solitary, apically few branched, erect, ca. 5 mm in diam. Basal and lower stem leaves often withered at anthesis, petiolate; petiole to 3 cm; leaf blade 2.5–7 × 3–4 cm, abaxially grayish green, tomentose, adaxially green, pubescent, base truncate, margin sparsely dentate, apex acute. Middle and upper stem leaves sessile, 4–10 × 0.5–3.5 cm, base auriculate, amplexicaul, acuminate to acuminata. Capitula 2–4, very long pedunculate, nodding, in racemiform synflorescence. Involucrre broadly hemispheric, 2–3 cm in diam. Phyllaries in 7–9 rows, straw-colored, blackish brown at margin, arachnoid, narrowly ovate-subulate to subulate-filiform, 1–1.5 mm wide, apex long acuminate and reflected. Corolla bluish purple, 1–1.3 cm, tube 6–7 mm, limb 6–7 mm, lobes 2–3 mm. Achenes black, ca. 4 mm, 4-angled, transversely rugose, apex with a denticate crown. Pappus pale brown, outer bristles short, inner bristles to 1.2 cm. Fl. Aug.

• Near mountain streams; ca. 3600 m. S Qinghai (Yushu).

This species has been described as having a row of short outer pappus bristles. However, on the image available to us, no such bristles can be seen. The nodding, large capitula and achene characters are typical for the genus Himalaiella; therefore, this taxon is excluded from Saussurea and included here in Himalaiella.


三角叶须弥菊  san jiao ye xu mi ju

Aplotaxis deltoidea Candolle, Prodr. 6: 541. 1838; Flovoria formosana (Hayata) Lipschitz; Saussurea deltoidea (Candolle) Schultz Bipontinus; S. formosana Hayata; S. kouptocheensis H. Léveillé; S. lamprocarpa Hemsley; S. radiata Franchet; Symurus taiwanius S. S. Ying.

Herbs 0.6–2(–3) m tall, biennial. Stem solitary, 0.5–1.5 cm in diam., erect, simple or branched. Lower and middle stem leaves petiolate; leaf blade ovate-elliptic in outline, lyrate pinnately divided, abaxially grayish white, arachnoid tomentose, gland-dotted, and with brown articulate hairs, adaxially green and scabrous; lateral segments 1 or 2 pairs, narrowly elliptic to triangular, 1 × 0.5–2 cm; terminal segment triangular-hastate, 7–35 × 6–25 mm, margin dentate, apex acute. Upper stem leaves shortly petiolate or sessile, ovate-elliptic, margin lobed or dentate. Capitula usually numerous, in an ample paniculiform synflorescence, nodding, long pedunculate. Involucrre broadly campanulate, (2–)3–4 cm in diam. Phyllaries in 5–7 rows, arachnoid tomentose; outer phyllaries triangular-ovate, 4–9 × 1.5–2 mm, apically with a triangular-ovate fimbriate appendage; middle phyllaries narrowly ovate-elliptic, 8–15 × 1.5–2.5 mm, with an apical appendage; inner phyllaries narrowly ovate to linear, 15–20 × 1.5–2.3 mm, apex acuminate and without an ap-
pendage. Receptacle bristles 7–10 mm. Corolla pink or white, (1.2–)1.5–2.1 cm, tube 0.9–1.2 cm, limb 6–9 mm, lobes 2.5–4 mm. Achene black, obconic, 3–4(–5) mm, 4-angled, apically muricate, apex with a denticulate crown. Pappus bristles white, (1.2–)1.4–1.6 cm. Fl. and fr. May–Nov. 2n = 34*

Mountain slopes, grasslands, forests, thickets, wastelands, pastures, forest margins; 700–3400 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, N India, Laos, Myanmar, Nepal, Pakistan, N Thailand, N Vietnam].


小头须弥菊  xiao tou xu mi ju

Aplotaxis nivea Candolle, Prodr. 6: 541. 1838; Saussurea cirsium H. Lév.; S. crispa Vaniot; S. deltoidea (Candolle) Schultz Bipontinus var. nivea (Candolle) C. B. Clarke; S. deltoidea subsp. polycephala (C. B. Clarke) H. Koyama; S. deltoidea var. polycephala C. B. Clarke; S. microdeltoidea Kitamura; S. nivea (Candolle) Schultz Bipontinus (1846), not Turczaninow (1837).

Herbs (0.3–)0.5–1.8 m tall, biennial. Stem solitary, 5–10 mm in diam., erect, simple or branched. Lower stem leaves petiolar; leaf blade lyrate-pinnately parted, abaxially grayish green, with dark veins, and tomentose, adaxially green, scabrous or sparsely arachnoid, and gland-dotted; lateral lobes 1 or 2 pairs, oblong-triangulart; terminal lobe triangular-hastate, 7–11 × 5–11 mm, margin dentate, apex acute. Middle and upper stem leaves petiolar; leaf blade triangular-hastate, narrowly ovate, or elliptic. Capitula numerous, in a racemiform to paniculiform synflorescence, subsessile to pedunculate. Involucre campanulate. Phyllaries in 4 or 5 rows; outer phyllaries narrowly ovate-elliptic, 3–5 × 1.5–2 mm, arachnoid tomentose and gland-dotted, with an orbicular fimbriate appendage; middle phyllaries narrowly ovate-elliptic, 5–9 × 1.5–2 mm, with an apical appendage; inner phyllaries narrowly ovate to linear, 12–13 × 1–1.5 mm, apex acuminatum and without an appendage. Receptacle bristles 4–5 mm. Corolla purple, 0.9–1.2 cm, tube 5–7 mm, limb 4–6 mm, lobes 2–3 mm. Achene black, obconic, 2–3.5 mm, 4-angled, apically muricate, apex with a denticulate crown. Pappus bristles straw-colored, 8–10 mm. Fl. and fr. Aug–Oct. 2n = 34.

Grasslands on mountain slopes, forests and forest margins in mountain valleys; 200–2800 m. Guizhou, Sichuan, Xizang, Yunnan [NE India, Laos, Myanmar, Nepal, Thailand, N Vietnam].

There are intermediate forms between Himalaiella deltoidea and H. nivea in those areas where both species occur. Further investigation is needed to clarify the status of these two taxa.


叶头须弥菊 ye tou xu mi ju

Saussurea peguensis C. B. Clarke, Compos. Ind. 235. 1876; S. dealbata Collett & Hemsley; S. deltoidea (Candolle) Schultz Bipontinus var. peguensis (C. B. Clarke) J. D. Hooker; S. leontopodium H. Lév. & Vaniot; S. phyllocephala Collett & Hemsley.

Herbs 0.5–1.5[–2.5] m tall, biennial. Stem solitary, 7–10 mm in diam., erect, simple. Basal and lower stem leaves petiolate; leaf blade elliptic to oblanceolate in outline, 8–30[–40] × 5–10[–15] cm, bipinnately lobed to pinnately divided, abaxially grayish green and densely tomentose, adaxially green, scabrous, and with brown articulate hairs; primary lobes 5–10 pairs; secondary lobes 1–4 pairs, ovate-elliptic to obliquely triangular, apex mucronate. Middle and upper stem leaves sessile, gradually smaller upward on stem, pinnately lobed to pinnately divided, base auriculate and semiamplexicaul, apex acute. Capitula numerous in a racemiform or paniculiform synflorescence, subsessile to pedunculate. Involucre campanulate, 1.5–2[–2.5] cm in diam. Phyllaries in 4 or 5 rows, apex acute; outer phyllaries grayish green, oblong-linear, 9–15 × 1–5 mm, herbaceous, arachnoid lanate, margin crenulatum; middle phyllaries narrowly triangular-ovate, 8–10[–15] × 1–1.5 mm; inner phyllaries linear, 8–10[–20] × 1–1.5 mm. Corolla purple, 1.3–1.5 cm, tube 6–7 mm, limb 6–7 mm, lobes 2–2.5 mm. Achene blackish brown, cylindric, 2–4 mm, apically muricate, apex with a crenulate crown. Pappus bristles dirty white, 1.1–1.2 cm. Fl. and fr. Sep–Oct. 2n = 34.

Forests; 1200–1600 m. Guizhou, Yunnan [Myanmar, N Thailand].


川木香属  chuan mu xiang shu

Mazzettia Iljin; Vladimiria Iljin.

Herbs, perennial, rosulate and stemless or shortly stemmed. Capitula solitary or several, clustered in center of leaf rosette or terminal on stem and subtended by bracts, large. Involucral campanulate. Phyllaries in several rows, imbricate, leathery to subleathery, margin ciliate. Receptacle flat, alveolate, naked or margin of alveolae with very short subulate cartilaginous processes. Corolla gland-dotted. Anther tails lacerate. Style branches divergent or coherent. Achene trigonous or tetragonous, sometimes cylindric, with an apical rim. Pappus bristles in 2 to several rows, scabrid to shortly plumose, basally connate into a ring, caducous as a whole.

Thirteen species: China, NW India, Kashmir, Myanmar, Nepal; 12 species (ten endemic) in China.

1a. Capitulum solitary, in center of leaf rosette or terminal on stem.

2a. Leaf blade undivided.

3a. Leaves 4–9 × 1.2–2 cm, margin entire; pappus bristles in 2 rows, barbellate ........................................ 1. D. georgei
3b. Leaves 7–20 × 4–19 cm, margin dentate; pappus bristles in many rows, scabrid .......................... 4. D. berardioidea
2b. Leaf blade pinnately lobed, pinnatifid, or pinnatipartite.

4a. Leaf blade green, concolorous, strigose or glabrous.

5a. Leaf blade 2.5–10 × 1–2.5 cm, glabrous; involucre 1.5–2.5 cm in diam. ................................. 2. D. salvinensis
5b. Leaf blade 5–20 × 3–17 cm, strigose; involucre 4–6 cm in diam. ................................. 3. D. edulis

4b. Leaf blade at least abaxially grayish white, densely tomentose.

6a. Leaf blade abaxially grayish white and densely tomentose, adaxially green and arachnoid only along midrib ................................................................. 5. D. platylepis
6b. Leaf blade on both surfaces grayish white to grayish white and arachnoid tomentose .......... 10. D. crispoundulata

1b. Capitula 2–15, clustered in center of leaf rosette.

7a. Outermost pappus bristles recurved and covering achene .......................................................... 7. D. souliei
7b. Outermost pappus bristles straight and not covering achene.

8a. Leaf blade green, almost concolorous, undivided or sometimes pinnately lobed, strigose ............. 6. D. forrestii
8b. Leaf blade at least abaxially grayish white, pinnately divided, densely tomentose.

9a. Leaf blade bipinnately lobed to bipinnatipartite.

10a. Style branches oblong, short, ± coherent, apex rounded; pappus yellowish brown ................. 11. D. calophylla
10b. Style branches linear, long and slender, divergent, apex acute; pappus brick-colored ............ 12. D. lateritia

9b. Leaf blade pinnatifide, pinnatisect, or lyrately pinnatisect.

11a. Leaf blade pinnatifide, arachnoid tomentose on both surfaces .............................................. 10. D. crispoundulata
11b. Leaf blade lyrately pinnatisect or pinnatisect, abaxially grayish white and tomentose, adaxially green and glabrous or sparsely arachnoid.

12a. Leaf blade lyrately pinnatisect, terminal lobe much larger than lateral ones ...................... 8. D. wardii
12b. Leaf blade pinnatisect, terminal lobe not much larger than lateral ones .............................. 9. D. scabrida


腺叶川木香 xian ye chuan mu xiang


Herbs 5–12(–18) cm tall, perennial, stemless or shortly stemmed. Caudei 1.5 cm in diam., simple or few branched. Rosette leaves petiolate; petiole 3–9 cm; leaf blade elliptic, narrowly obovate, or spatulate, 4–9 × 1.2–2 cm, both surfaces green and densely gland-dotted but otherwise glabrous, base attenuate, margin entire or shallowly undulate, apex acute to obtuse. Capitulum solitary, in center of leaf rosette or terminal on stem and subtended by bracts. Involucre campanulate or broadly cylindric, 2–3 cm in diam. Phyllaries in 4 or 5 rows, leathery, glabrous, margin purplish and scarious; outer and middle phyllaries ovate, narrowly ovate, or ovate-elliptic, 1.5–3 × 0.5–0.8–1 cm, apex obtuse; inner phyllaries elliptic to broadly linear, 3–3.5 × 0.3–0.4 cm, apex acute to acuminate. Corolla purplish red, 3–3.5 cm, tube ca. 2.7 cm, limb 8–9 mm, lobes 3.5–4 mm. Style branches 3–4 mm, slender, divergent. Achene trigonous or quadrangular, 4–6 mm, glabrous. Pappus bristles in ca. 2 rows, dirty white to pale yellowish brown, barbellate, 2.5–3.2 cm. Fl. and fr. Aug.–Oct.

Forest margins, grasslands on mountain slopes; 2900–3800 m. NW Yunnan (Dêqên, Gongshan) [Myanmar].


菜川木香 cai chuan mu xiang

Vladimiria edulis (Franchet) Franchet; J. edulis var. caulescens Franchet; Vladimiria edulis (Franchet) Y. Ling.

Herbs 4–10 cm tall, perennial, stemless or shortly stemmed. Caudei 0.5–1.5 cm in diam., unbranched. Rosette leaves petiolate; petiole long, winged; leaf blade elliptic, narrowly elliptic, narrowly ovate, or spatulate, 2.5–10 × 1–2.5 cm, both surfaces green and glabrous, base attenuate, margin entire, obtusely dentate, or ± pinnately lobed, apex obtuse to acute. Upper stem leaves similar to basal leaves, subtending and overtopping capitulum. Capitulum solitary, in center of leaf rosette or terminal on stem. Involucre 1.5–2.5 cm in diam. Phyllaries in 3 or 4 rows, apex obtuse to acute; outer phyllaries ovate, 10–13 × 3–6 mm; middle phyllaries ovate to narrowly ovate, 14–15 × 3–5 mm; inner phyllaries narrowly ovate, 1.6–2 × 0.2–0.3 cm. Corolla purplish red, 2–2.5 cm, tube 1–1.7 cm, limb 7–8 mm, lobes 4–5 mm. Style divergent, 1.5–2 mm. Achene black, trigonous, 3.5–4.5 mm. Pappus bristles in several rows, yellowish brown, scabrid to barbellate, 1.2–2.3 cm, apically shortly plumose. Fl. and fr. Jul.–Sep.

Forest margins, grasslands on mountain slopes; 2900–3800 m. NW Yunnan (Dêqên, Gongshan) [Myanmar].


怒江川木香 nu jiang chuan mu xiang


Herbs 8–30 cm tall, perennial, stemless or shortly stemmed. Rosette leaves petiolate; petiole 1–11 cm; leaf blade obovate, elliptic, broadly ovate-elliptic, or suborbicular, 5–20 × 3–17 cm, pinnately divided, pinnately lobed, or sometimes undivided, both surfaces green to yellowish green and sparsely to densely strigose, base cordate, cuneate, or truncate; lobes 3–7 pairs, ovate, falcate, or obliquely triangular, margin apiculate or spinulose dentate. Capitulum solitary, in center of leaf rosette or
terminal on stem and subtended by uppermost leaves. Involucre broadly campanulate, 4–6 cm in diam. Phyllaries in 4 or 5 rows, rigid; outer and middle phyllaries ovate to elliptic, 1.2–2.6 × 0.8–1.7 cm, apex rounded to obtuse; inner phyllaries narrowly ovate, elliptic, or broadly linear, 2.5–4 × 0.3–0.6 cm, apex acuminate. Corolla purplish red to bluish purple, 2.8–3.2 cm, tube 2–2.7 cm. Achene pale brown, trigonous, 7–8 mm, wrinkled. Pappus bristles in many rows, yellowish brown, scabrid to barbellate, 2–2.6 cm. Fl. and fr. Jun.–Oct.

Forest margins, grasslands, fallow open areas; 2600–4700 m. W Sichuan, SE Xizang, NW Yunnan [N Myanmar].


厚叶川木香 hou ye chuan mu xiang

Jurinea edulis (Franchet) Franchet var. berardioidea Franchet, J. Bot. (Morot) 8: 338. 1894; J. berardioidea (Franchet) Diels; Vladimiria berardioidea (Franchet) Y. Ling.

Herbs 5–17 cm tall, perennial, stemless or shortly stemmed. Caudex to 2 cm in diam., simple. Rosette leaves petiolate; petiole 1–13 cm; leaf blade elliptic, ovate, or oblong, 7–20 × 4–19 cm, both surfaces green to yellowish green and densely strigose and gland-dotted, base shallowly cordate to truncate, margin undulate or sparsely spinulose-dentate, apex rounded to acute. Bracts 4–7, sessile, smaller than rosette leaves. Capitulum solitary, in center of leaf rosette, sessile or slightly pedunculate. Involucre campanulate, 4–6(–8) cm in diam. Phyllaries in 4 or 5 rows; outer phyllaries elliptic to narrowly ovate-elliptic, or narrowly ovate-elliptic, 1.5–2.5 × 1–1.3 cm; middle and inner phyllaries narrowly ovate-elliptic, 2.5–4 × 0.6–0.8 cm. Corolla purplish red, 3–3.2 cm, tube 2–2.3 cm, limb ca. 1 cm. Achene trigonous, 7–10 mm. Pappus bristles in many rows, yellowish brown, scabrid to barbellate, 2.5–2.8 cm. Fl. and fr. Jun.–Oct.

- Grasslands or thickets on mountain slopes; 2800–3300(–5200) m. NW Yunnan (Dali, Lijiang, Yangbi).


平苞川木香 ping bao chuan mu xiang


Herbs 7–12 cm tall, perennial, stemless or shortly stemmed. Rosette leaves petiolate; petiole to 10 cm; leaf blade obovate, ovate, or elliptic, 5–18 × 5–13 cm, pinnately lobed or pinnatifid, abaxially grayish white and densely tomentose, adaxially green and arachnoid only along midrib, base truncate or cuneate, margin pinnately dentate; lobes 2 or 3 pairs, obliquely broadly triangular to obliquely ovate, margin spinulose-dentate, apex rounded, obtuse, or acute; terminal lobe semiobtuse to irregularly rhombic, apex obtuse to rounded. Capitulum solitary, in center of leaf rosette or terminal on stem. Involucre broadly bowl-shaped, 3.5–6 cm in diam. Phyllaries in ca. 4 rows, leathery; outer phyllaries broadly ovate, 1.4–1.8 × 1–1.5 cm, apex rounded to obtuse; middle phyllaries narrowly elliptic to elliptic, 2.2–2.5 × 0.5–1 cm, apex obtuse to acute; inner phyllaries narrowly ovate-elliptic to linear, 2.5–3 × 0.3–0.5 cm, apex acute. Corolla purplish red, ca. 3 cm, tube ca. 2 cm and slender, limb 8–10 mm, lobes 4.5–5 mm. Style branches 3.5–4.5 mm, slender. Achene obconic, ca. 8 mm. Pappus bristles in many rows, yellowish white, barbellate, 2.5–3 cm. Fl. and fr. Sep.–Oct.

- Grasslands, thickets on mountain slopes; 3100–3400 m. SW Sichuan.


膜缘川木香 mo yuan chuan mu xiang


Herbs 6–15 cm tall, perennial, stemless or shortly stemmed. Caudex 1–1.5 cm in diam., simple. Rosette leaves petiolate; petiole 3–10 cm; leaf blade elliptic, obovate, ovate, or subtriangular, 10–20(–30) × 5–15 cm, pinnately lobed to undivided, green or yellowish green, almost concolorous, sparsely strigose, base subcordate, truncate, or cuneate-attenuate, margin spinulose-dentate to sinuate-denticulate, apex rounded to acuminate; lobes 4–8 pairs, ovate, broadly triangular, or falcate. Upper leaves smaller, pale yellowish green, base cuneate-attenuate, apex acute. Capitula 3–9, clustered in center of leaf rosette, sessile or slightly pedunculate. Involucre campanulate, 2.5–2.6(–3) cm in diam. Phyllaries in 5 or 6 rows, leathery, glabrous, margin dark brown and scarious; outer phyllaries ovate to elliptic, 7–15 × 5–9 mm, apex rounded to obtuse; middle and inner phyllaries elliptic to narrowly elliptic, 1.5–3 × 0.4–0.7 cm, apex obtuse, acute, or acuminate. Corolla purplish red, 2.3–2.8(–3.5) cm, tube 1.4–2 cm, limb 8–10 mm, lobes 5–6 mm. Achene cylindric, 4–7 mm, 4-angled, apically verrucose. Pappus bristles in many rows, yellowish brown, scabrid to barbellate, 2.5–2.8 cm. Fl. and fr. Jul.–Nov.

- Grasslands on mountain slopes, forests, forest margins; 3000–4200 m. SW Sichuan, SE Xizang, NW Yunnan.

Dolomiaea denticulata was described from a specimen without basal leaves and is only known from two collections. The diagnostic characters, exclusively of the upper leaves, do not seem to be sufficient to treat these plants as specifically different from D. forrestii.


川木香 chuan mu xiang

Herbs, perennial, stemless. Caudex 1.5–2 cm in diam., simple. Rosette leaves petiolate; petiole 2–6(–16) cm; leaf blade elliptic, narrowly elliptic, narrowly ovate, or narrowly obovate, 10–30 × 5–13 cm, pinnately lobed, pinnatisect, or sometimes bipinnatisect, green, pale green, or grayish white, concolorous or abaxially grayish white, both surfaces sparsely strigose and gland-dotted or abaxially sparsely arachnoid to tomentose, margin lobed and spinulose-dentate, rarely entire; lateral lobes 4–7 pairs, obliquely triangular to narrowly ovate; terminal lobe
similar to lateral ones but smaller. Capitula 2–12, clustered in center of leaf rosette, pedunculate. Involucre broadly campanulate, 2.5–4–6 cm in diam. Phyllaries in ca. 6 rows, apex acuminate and spinulose; outer phyllaries ovate to ovate-elliptic, 2–2.5 × 0.8–1 cm; middle phyllaries elliptic to narrowly ovate-elliptic, 2.5–3 × 0.6–1.1 cm; inner phyllaries narrowly ovate-elliptic, 3.5–5 × 0.5–0.8 cm. Corolla dark red, 3–4 cm, tube 2–3 cm, limb 1–1.2 cm, lobes 6–7 mm. Achene cylindric, 7–8 mm, glabrous or apically gland-dotted. Pappus bristles in many rows, yellowish brown, scabrid to barbellate, 2.5–4 cm; outermost pappus recurved, plicate and covering achene. Fl. and fr. Jul–Oct.

- Alpine grasslands or thickets, grasslands on mountain slopes; 3500–4800 m. W Sichuan, E Xizang, NW Yunnan.

The roots are used medicinally.

1a. Leaf blade green to pale green, ± concolorous. 7a. var. souliei

1b. Leaf blade abaxially grayish white, adaxially green to pale green. 7b. var. cinerea

7a. Dolomiaea souliei var. souliei

川木香(原变种) chuan mu xiang (yuan bian zhong)

Jurinea souliei Franchet, J. Bot. (Morot) 8: 337. 1894; Vladimiria souliei (Franchet) Y. Ling.

Leaf blade green to pale green, ± concolorous, sparsely strigose, gland-dotted.

- Alpine grasslands or thickets; 3700–4800 m. W Sichuan, E Xizang.


灰毛川木香 hui mao chuan mu xiang


Leaf blade abaxially grayish white, sparsely arachnoid to arachnoid tomentose, and gland-dotted, adaxially green to pale green, sparsely strigose, and gland-dotted.

- Grasslands on mountain slopes; 3500–4200 m. W Sichuan, E Xizang, NW Yunnan.

Jurinea multiensis and J. trachyloma were described on account of their leaf shape and indumentum, which is quite different from that of Dolomiaea souliei and seems to be a constant character at least in J. trachyloma from SW Sichuan. More material is needed to clarify the taxonomic status of these plants.


西藏川木香 xiang chuan mu xiang


Herbs 3–5 cm tall, perennial, stemless. Rosette leaves petiolate; petiole 1.5–7.5 cm; leaf blade obovate, narrowly obovate, or oblong, 5–20 × 2–5 cm, lyrate pinnatisect, abaxially grayish white and densely tomentose, adaxially green and glabrous or sparsely arachnoid; lateral segments in 3–6 pairs, broadly elliptic, oblong, or suborbicular, 0.7–1.5 × 0.7–1.5 cm, margin serrate-dentate or denticulate or rarely shallowly create, apex rounded; terminal segment ovate to broadly ovate, 2.5–5 × 1.5–3 cm. Capitula 4–8, clustered in center of leaf rosette, forming a hemispheric synflorescence, sessile or subsessile. Involucre campanulate, 1.5–2(–3) cm in diam. Phyllaries in 4 or 5 rows, herbaceous, basally straw-colored, apically purple, apex acute to acuminate; outer phyllaries obovate to elliptic, 4.8–3.5–4 cm; middle phyllaries elliptic to narrowly ovate-elliptic, 10–15 × 2–3(–5) cm; inner phyllaries linear-elliptic to broadly linear, 1.5–2.3 × 0.2–0.3 cm. Corolla purplish red, 1.6–2 cm, tube 7.5–11 mm, limb 8–9 mm, lobes 3–3.5 mm. Style branches ca. 3 mm, slender. Achene grayish brown, obconic, 6–7 mm, wrinkled. Pappus bristles in many rows, dirty white but basally pale brown, scabrid, 1.5–2 cm. Fl. and fr. Jul–Sep.

- Thickets on mountain slopes, gravelly and sandy riversides; 3800–4500 m. SE Xizang.


糙羽川木香 cao yu chuan mu xiang


Herbs, perennial, stemless. Rosette leaves petiolate; petiole 2–4.5 cm; leaf blade narrowly elliptic, 4–12 × 1–3 cm, pinately divided, abaxially grayish white and densely arachnoid tomentose, adaxially green and glabrous or sparsely arachnoid on veins; lateral segments 4–6 pairs, elliptic, obliquely ovate, or obovate, 0.5–2 × 0.4–1.5 cm, margin denticulate; terminal segment narrowly ovate, 2–3 × 1–2 cm. Capitula 2 or 3, clustered in center of leaf rosette, shortly pedunculate. Involucre ca. 3 cm in diam. Phyllaries in ca. 4 rows, glabrous, apex acuminate; outer phyllaries narrowly triangular, ca. 15 × 4 mm; middle phyllaries narrowly ovate to elliptic, 16–19 × 2–3 mm; inner phyllaries broadly linear, ca. 1.9 × 0.2 cm, apex acuminate. Corolla purple, ca. 2 cm, tube ca. 1.1 cm, limb ca. 9 mm. Style branches ca. 2.5 mm, apex acuminate. Achene brown, obconic, 6–7 mm, glabrous. Pappus bristles in 2 rows, pale brown to dirty brown, scabrid, ca. 3 cm. Fl. and fr. Aug.

- Gravelly places by rivers; 4400–4500 m. SC Xizang (Ngamring).

This species is only known from a single locality and is probably close to Dolomiaea wardii.


皱叶川木香 zhou ye chuan mu xiang

Herbs to 6 cm tall, perennial, stemless or shortly stemmed. Caudex stout, simple or branched. Rosette leaves petiolate; petiole 1–3 cm; leaf blade elliptic to broadly linear, 2–7 × 0.7–1.3 cm, pinnately divided, abaxially grayish white and densely arachnoid tomentose, adaxially grayish green and arachnoid tomentose, base obtuse to rounded; segments in 3–15 pairs, obliquely triangular, broadly ovate, or semi-ovaricular; terminal lobe ovate, to 1 cm, apex obtuse. Capitula solitary or to 3, in center of leaf rosette, sessile or subsessile. Involucre campanulate, 2–3 cm in diam. Phyllaries in 4 or 5 rows, pale green, apically purplish, leathery, sparsely arachnoid, glabrescent, apex acuminate; outer phyllaries triangular to ovate-triangular, 6–13 × 1.5–2.5 mm; middle and inner phyllaries triangular to narrowly ovate, 1.4–2.5 × 0.3–0.4 cm. Corolla limb 3 × as long as tube. Anther tails filiform-acuminate, undivided. Style branches long, wrinkled, glabrous. Pappus bristles in 2–4 rows, basal yellowish brown and apically purplish, scabrid, 1.5–1.6 cm. Fl. Jul.

- Thickets, open ground; 4100–4400 m. SC Xizang (Gyangzê, Nyêmo).


美叶川木香 mei ye chuan mu xiang

Herbs, perennial, stemless. Rosette leaves petiolate; petiole 2–4 cm; leaf blade elliptic to narrowly ovate, 6–30 × 2–5 cm, pinnately lobed, abaxially white and densely tomentose, adaxially green and strigose or sparsely arachnoid; primary lobes 5–10 pairs, ovate to elliptic; secondary lobes elliptic, obliquely ovate, or semi-ovaricular, margin spinulose-denticulate. Capitula 5–15, clustered in center of leaf rosette, forming a hemispheric synflorescence. Involucre 1.5–2 cm in diam. Phyllaries in 5 or 6 rows, apically purplish red, apex mucronate; outer phyllaries elliptic, 9–11 × ca. 5 mm; middle phyllaries narrowly ovate-elliptic, 12–17 × ca. 5 mm; inner phyllaries narrowly ovate-elliptic to linear, 1.8–2 × 0.2–0.3 cm. Corolla purplish red, 1.5–2.2 cm, tube ca. 1.2 cm, lobes 4–5 mm. Style branches ca. 1 mm, ± coherent, apex obtuse. Achene tetragonal, obconic, 4–5 mm, ± wrinkled. Pappus bristles in many rows, blackish to yellowish brown, barbellate, ca. 2 cm. Fl. and fr. Aug.

- Alpine grasslands, scree slopes; 3300–4700 m. SC Xizang.


红冠川木香 hong guan chuan mu xiang

Herbs, perennial, stemless. Rosette leaves petiolate; petiole ca. 5 cm; leaf blade elliptic, 9–24 × 5–8 cm, pinnately lobed to bipinnately divided, abaxially grayish white and densely tomentose, adaxially green and glabrous; primary lobes ca. 8 pairs, narrowly ovate to elliptic; secondary lobes triangular, narrowly triangular, or ovate, margin spinulose-denticulate. Capitula ca. 8, clustered in center of leaf rosette, forming a hemispheric synflorescence, shortly pedunculate. Involucre campanulate, ca. 2.5 cm in diam. Phyllaries in ca. 6 rows, dark red, leathery, glabrous, apex acuminate; outer phyllaries narrowly ovate-triangular, 10 × 2 mm; middle phyllaries narrowly triangular, 1.5–2.5 × 0.5–0.6 cm; inner phyllaries narrowly ovate-elliptic to elliptic, 2.3–3.5 × 0.6–0.7 cm. Corolla purplish red, ca. 3 cm, tube ca. 2.2 cm, limb 8–10 mm, lobes 4–5 mm. Style branches linear, narrowed, divergent. Achene (ripe) unknown. Pappus bristles in many rows, brownish in basal half and brick-colored in apical half, scabrid, ca. 1.8 cm. Fl. Sep.

- Alpine meadows, thickets; ca. 3400 m. S Xizang (Gyirong).

Dolomiaea lateritia is only known from the type collection.

Except for the divergent and narrowed style branches and for the pappus color, this species is very similar to D. calophylla and D. macrocephala. Lack of material does not permit a decision here about whether these plants are conspecific or not.


球菊属 qiu ju shu

Shi Zhu (石铸 Shih Chu); Eckhard von Raab-Straube


- One species: China.

The character combination for this genus is rather unique within the Saussurea group, but Bolocephalus is probably closely related to Dolomiaea and Broduvia. In the protologue, the receptacle was described as naked, whereas by C. Shih (FRPS 78(1): 44. 1987) that description was corrected to a receptacle having long bristles. Bolocephalus is preliminarily maintained here as a distinct genus because morphological data of receptacle, achene, and pappus structure are not sufficient to attribute it to another genus, and molecular data are lacking.

Herbs 10–30 cm tall, perennial. Caudex stout, unbranched. Stem solitary, 4–6 mm in diam., erect, simple, hollow, basally sparsely arachnoid, apically densely lanate. Basal leaves many, petiolate; petiole 3–6 cm; leaf blade elliptic to broadly linear, 10–20 × 1–1.5 cm, runcinate, pinnately lobed, or pinnatifid, abaxially grayish white and densely tomentose, adaxially green and sparsely arachnoid tomentose but glabrescent; lobes 2–5 pairs, broadly or obliquely triangular, margin entire; terminal lobe elliptic to narrowly elliptic, apex acute to rounded. Stem leaves few, similar to basal leaves. Uppermost stem leaves linear, undivided. Capitulum solitary, drooping. Involucre globose, 5–6 cm in diam. Phyllaries in 5 or 6 rows, densely and fluffily lanate, apex long acuminate; outer and middle phyllaries triangular-subulate, 1.5–2.5 × 0.1–0.3 cm; inner phyllaries linear-subulate, 2.5–3.5 × 0.1–0.3 cm. Receptacle bristles to 1.1 cm. Corolla purplish red, ca. 1.6 cm, tube ca. 4 mm, limb ca. 1.2 cm, lobes ca. 2.5 mm. Achene brown, obconic, ca. 5 mm, 4- or 5-ribbed, apically with a rim. Pappus bristles scabriform, to 1.5 cm. Fl. and fr. Aug.

- Alpine scree slopes, cliffs, rocks, *Rhododendron* thickets; 4000–5000 m. Xizang (Nangxian).


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**Frolovia** is very closely related to *Aucklandia* (see note under that genus). In G. M. Shen (Fl. Xinjiang. 5: 273. 1999), the species of this genus is included in *Saussurea*. Molecular analysis by Y. J. Wang et al. (Ann. Bot. 99: 311–322. 2007) has shown that *Frolovia* and *Aucklandia* are more closely related to *Dolomiaea* than to *Saussurea*.
loved or undivided; leaf blade cordate, triangular-ovate, or ovate. Capitula usually clustered at stem apex, large. involucre hemispheric. Phyllaries blackish, imbricate, narrowly ovate-elliptic to linear, apex long acuminate and often reflexed. Receptacle with many long subulate bristles. Corolla glabrous, tube as long as limb. Anther tails lacerate, lunate. Achenes glabrous, wrinkled, apically crowned. Pappus homomorphic, in 1 row; bristles numerous, straw-colored to brownish, plumose, flattened, basally connate into a ring, caducous as a whole.

One species: N India, Kashmir, N Pakistan; introduced to China.

_Aucklandia_ and _Frolovia_ are very closely related. In a molecular study by Y. J. Wang et al. (Ann. Bot. 99: 311–322, 2007), the two genera form together a small clade, which is nested within the morphologically much different genus _Dolomiaea_. However, as sampling and analysis of this group is not yet complete, we prefer not to make generic rearrangements of these species here. In C. Shih and S. Y. Jin (FRPS 78(2): 58. 1999), the species of this genus is included in _Saussurea subg. Frolovia._


_云木香_ yun mu xiang

_Aplotaxis lappa_ Decaisne; _Saussurea costus_ (Falconer) Lipschitz; _S. lappa_ (Decaisne) Schultz Bipontinus.


1. **Hemisteptia lyrata** Z. H. Shi, in Zhu (石铸 Shih Chu); Eckhard von Raab-Straube

Shi Zhu (石铸 Shih Chu); Eckhard von Raab-Straube


_泥胡菜属_ ni hu cai shu

Shi Zhu (石铸 Shih Chu); Eckhard von Raab-Straube


One species: E and S Asia, E Australia.
chuan, Taiwan, Yunnan, Zhejiang [?Bangladesh, Bhutan, India, Japan, Korea, Laos, Myanmar, Nepal, Thailand, Vietnam; E Australia].

The earlier publication of the name “Hemistepta [sic!] lyrata” by Bunge in Ledebour (Dorpat Jahrh. Litt. 1: 221. 1833) was not valid because the generic name had not been previously validly published (Vienna Code, Art. 43.1); nor were the generic and specific names simultaneously validated there (Art. 42.1: “Reference to an earlier description is not acceptable in place of a descriptor generico-specifica”).

“Saussurea affinis Spreng.” and “S. stricta Spreng.” (Candolle, Prodr. 6: 540. 1838) both belong here but were not validly published because they were merely cited as synonyms of Aplotaxis carthamoides and A. multicaulis, respectively (Vienna Code, Art. 34.1(c)).


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<tr>
<th>Species</th>
<th>Habitat</th>
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<td>Saussurea alpina</td>
<td>Endemic to the Xizang Plateau. In China, the Hengduan Shan area is the center of diversity of Saussurea, with more than one hundred species, many of them endemic.</td>
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Herbs, usually perennial or sometimes biennial, sometimes subshrubs, cauliforous or stemless, often with woody caudex. 

Capitulum solitary or to very numerous and in a corymbiform, hemispheric, paniculiform, or racemiform synflorescence, sessile or pedunculate. Involucre campanulate, globose, ovoid, cylindric, or tubular. Phyllaries imbricate, sometimes with an apical appendage. 

Receptacle flat or convex, usually with subulate bristles or sometimes with short papillae, rarely naked. Corolla usually purple, often bluish or reddish, sometimes with sessile glands or papillae. 

Anthers dark purple, dark blue, or black; anther tails sagittate, entire, lacerate, or lanate. Achenes straw-colored, sometimes with black spots, brown or black, ± ribbed, smooth or transversely wrinkled, usually glabrous, rarely with glands, papillae, or hairs; apical rim inconspicuous, entire or sometimes forming a short crown. Pappus in 2 rows, heteromorphic, dirty white, yellowish, straw-colored, brown, dark gray, or black; outer bristles usually more numerous and shorter than inner ones, often of different lengths, scabrid, very rarely barbellate or plumose, individually caducous, very rarely lacking; inner bristles fewer and longer than outer ones, usually of same length, basally connate into a ring, always plumose, caducous or persistent.

About 415 species: Asia, C, E, and N Europe, W North America; 289 species (191 endemic) in China.

By far, the greatest diversity of the genus is in high mountains of temperate Asia, particularly in Siberia, C Asia, the Himalaya, and the Qinghai-Xizang Plateau. In China, the Hengduan Shan area is the center of diversity of Saussurea, with more than one hundred species, many of them endemic.

The taxonomy of the genus Saussurea follows largely the monograph by Lipschitz (Rod. Saussurea, 1–284. 1979), although it is quite clear that his infragenic taxa do not represent natural groups. Despite some recent attempts to clarify the evolution of Saussurea, also with the help of molecular methods (Raab-Straube, Willdenowia 33: 379–402. 2003; Kita et al., Taxon 53: 679–690. 2004; Y. J. Wang & J. Q. Liu, Biochem. Syst. Ecol. 32: 1009–1023. 2004; Y. J. Wang et al., Biol. J. Linn. Soc. 97: 893–903. 2009), a well-supported phylogeny of the whole genus is still lacking. Therefore, and because of the pragmatic need to subdivide the large genus into manageable and recognizable groups, we still adopt to a large extent the infragenic subdivision by Lipschitz, keeping in mind that this classification is a highly artificial one. However, those species placed by him in Saussurea, which are now thought to belong to Aucklandia, Frolovia, and Himalaetia (see Raab-Straube, loc. cit.), are excluded from this treatment and can be found under the respective segregate genera. Saussurea is divided here into four subgenera: S. subg. Eriocoryne, S. subg. Amphilaena, S. subg. Theodorea, and S. subg. Saussurea. Saussurea subg. Saussurea is further divided into eight sections: S. sect. Juriniformes, S. sect. Jacea, S. sect. Gymnocline, S. sect. Laguranthera, S. sect. Lagrostemon, S. sect. Strictae, S. sect. Rosulacentes, and S. sect. Saussurea. Some of the sectional names used by Lipschitz have to be replaced by older ones that have priority at this rank.

Many Saussurea species are used medicinally, as for example: S. arenaria, S. epilobioides, S. involucrata, S. laniceps, S. leucoma, S. medusae, S. obvallata, and S. stella. Some of them are collected and marketed in large quantities and need strong protection in their natural habitats.

1a. Capitula or synflorescence enclosed, half-enclosed, or subtended by yellowish, red, or purple, membranous uppermost leaves; leaves always undivided ................................................................. 2. S. subg. Amphilaena (p. 67)

1b. Capitula or synflorescence not enclosed, half-enclosed, nor subtended by colored, membranous uppermost leaves; leaves undivided

2a. Capitula usually clustered in densely congested hemispheric or rarely an interrupted spiciform or corymbiform synflorescence, rarely solitary terminal on stem or in rosette of leaves, usually surrounded or half-surrounded by densely lanate subtending leaves or subtended and exceeded by stellately arranged uppermost leaves; stems usually hollow, apically widened and club-shaped ............................................................................................................. 1. S. subg. Eriocoryne (p. 57)

2b. Capitula in a corymbiform, paniculiform, or racemiform synflorescence or solitary terminal on stem, not surrounded by densely lanate subtending leaves nor by stellately arranged uppermost leaves; stems solid or hollow but not apically widened.

3a. Phyllaries or at least inner phyllaries with a conspicuous appendage; appendage often colored and membranous, or herbaceous and callose-serrulate, or cartilaginous spiniform; herbs mostly biennial, rarely perennial ................................................................. 3. S. subg. Theodorea (p. 75)

3b. Phyllaries without an appendage or with a green herbaceous appendage but neither callose-serrulate nor spiniform, rarely with a long cusp or pectinate; plants always perennial ................................................................. 4. S. subg. Saussurea (p. 82)

雪兔子亚属  xue tu zi ya shu

Aplotaxis sect. Eriocoryne Wallich ex Candolle, Prodr. 6: 541. 1838.

Herbs, perennial or rarely biennial, monocarpic or polycarpic, cauliherous, stemless, or substemless, often densely lanate, rarely glabrous or subglabrous. Stem erect, usually hollow, apex usually club-shaped and inflated. Leaves densely lanate, cottony, sericeous, tomentose, or glabrous, margin entire, denticulate, dentate, pinnately lobed, or pinnately divided. Capitula numerous or rarely solitary, usually aggregated in a densely congested hemispheric synflorescence in center of leaf rosette or terminal on stem, enclosed or subtended by uppermost stem leaves or rarely in an interrupted spiciform or corymbiform synflorescence. Phyllaries without an appendage. Receptacle usually with subulate bristles, sometimes with short papillae, or naked. Corolla usually glabrous, sometimes papilllose. Achene smooth or wrinkled, usually glabrous, sometimes papilllose, rarely thinly arachnoid or gland-dotted, usually without apical crown (in Saussurea stella with dentate crown). Pappus dirty white, straw-colored, light to dark brown, gray, or blackish, usually in 2 rows; outer bristles usually scabrid or rarely plumose, sometimes lacking.

Thirty-four species: Afghanistan, Bhutan, China, India, Kashmir, Kazakhstan, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia (Siberia), Tajikistan; 30 species (14 endemic) in China.

Saussurea subg. Eriocoryne occurs mainly on the Qinghai-Xizang Plateau and adjacent areas.

1a. Plants stemless or shortly stemmed, monocarpic; caudex simple, bearing a single terminal rosette.

2a. Leaves yellowish green or grayish green, densely sericeous or lanate.

3a. Leaves pinnately lobed to pinnately divided ............................................................. 5.

3b. Leaves undivided, margin entire or crenulate.

4a. Leaves densely lanate in basal part, glabrous in apical part, apex long acuminate .................................... 9.

4b. Leaves densely sericeous or lanate throughout, apex obtuse ...................................................... 10.

2b. Leaves green and often with a red or purplish base or reddish, glabrous or sparsely arachnoid floccose.

5a. Capitulum solitary, large, 3–4 cm in diam., in center of leaf rosette .................................................. 6.

5b. Capitula numerous, much smaller, in a clustered hemispheric synflorescence.

6a. Leaves pinnately lobed to pinnately divided .................................................................................. 5.

6b. Leaves undivided, margin entire or crenulate.

7a. Leaves sessile, narrowly triangular to linear, 2.5–20 cm, apex very long acuminate ....................... 7.

7b. Leaves petiolate, elliptic, ovate, or spatulate, 1–2.5 cm, apex obtuse or rounded ............................. 8.

1b. Plants usually with a developed stem, monocarpic or polycarpic, if almost stemless then polycarpic with branched caudex bearing several sterile leaf rosettes and flowering shoots.

8a. Leaves glabrous or sparsely pilose or tomentose and glabrescent.

9a. Plants 40–90 cm tall, not caespitose; capitula in a ± congested corymbiform synflorescence ......................... 1.

9b. Plants 10–20 cm tall, caespitose; capitula in a densely clustered hemispheric synflorescence .................. 2.

8b. Leaves densely lanate, villous, sericeous, or tomentose, sometimes adaxially glabrous.

10a. Annuals or biennials; stem diffusely branched; capitula in a lax corymbiform synflorescence ............ 4.

10b. Perennials; stem simple; capitula in a densely congested corymbiform, hemispheric, or spiciform synflorescence or rarely solitary (in S. conaensis and S. tridactyla var. maiduoganla and sometimes in S. paxiana).

11a. Stem 15–35 cm tall, not hidden by leaves or lanate indumentum ..................................................... 3.

11b. Stem usually less than 15 cm tall, if taller then entirely hidden by leaves and lanate indumentum.

12a. Synflorescence at anthesis concealed in lanate indumentum; capitula surrounded and much exceeded by densely lanate bracts.


13b. Capitula numerous, in a ± congested synflorescence.

14a. Synflorescence interrupted spiciform; capitula not clustered on stem apex .................. 25.

14b. Synflorescence hemispheric; capitula clustered on stem apex.

15a. Capitula loosely clustered on obovoid stem apex .................................................. 29.

15b. Capitula densely aggregated on flat or convex stem apex.


16b. Phyllaries in 1–4 rows, almost equal in length.

17a. Plants monocarpic, not caespitose; caudex simple; leaves with white hairs; phyllaries in 3 or 4 rows .................................. 27.

17b. Plants polycarpic, caespitose; caudex branched; leaves with yellowish golden hairs; phyllaries in 1 row ........................................ 30.
12b. Synflorescence at anthesis not concealed in lanate indumentum; capitula exposed on stem apex, not exceeded by densely lanate bracts.

18a. Pappus dull dark brown, mouse-gray, or blackish.

19a. Plants not caespitose; caudex long, creeping, fragile, branched below ground level; leaf blade elliptic to narrowly elliptic, pinnately lobed to pinnately divided, 5–15 mm wide ................................................................. 16. S. quercifolia

19b. Plants usually caespitose; caudex short, branched at ground level; leaf blade obovate, spatulate, or linear-oblong, undivided, 2–8 mm wide.

20a. Rosette and lower stem leaves green, glabrescent; petioles green, elongated; leaf margin obtusely sinuate-dentate; outer pappus bristles always reflexed and appressed on achene ........................................ 13. S. inversa

20b. Rosette and lower stem leaves whitish, densely tomentose; petioles purple, short; leaf margin entire or shallowly crenate; outer pappus bristles usually erect ................................................................. 14. S. gnaphalodes

18b. Pappus white, dirty white, straw-colored, light brown, or brown.

21a. Plants shortly stemmed, less than 10 cm tall.

22a. Leaf blade very small, less than 1 cm ........................................................ 15. S. sugongii

22b. Leaf blade larger, more than 1 cm.

23a. Upper stem leaves elliptic, not reflexed, apex obtuse to rounded ...... 12. S. glacialis

23b. Upper stem leaves linear, reflexed, apex acuminate ....................... 19. S. gyacaensis

21b. Plants with a distinct elongate erect flowering stem, usually more than 10 cm tall.

24a. Rosette and lower stem leaves adaxially densely yellowish or white lanate throughout.

25a. Leaf margin apically 3–6-lobed; corolla glabrous ............................. 22. S. tridactyla

25b. Leaf margin pinnately lobed or dentate; corolla ± papillose.

26a. Lower stem leaves fan-shaped to rhombic, more than 1 cm wide, margin dentate or pinnately lobed; achene glabrous or sparsely papillose on rim ................................................. 23. S. medusa

26b. Lower stem leaves narrowly spatulate, less than 1 cm wide, margin pinnately lobed; achene densely papillose on rim ....... 24. S. namikawae

24b. Rosette and lower stem leaves adaxially dark green or purplish, arachnoid floccose, tomentose, or glabrescent, sometimes only lanate toward base.

27a. All leaves deeply pinnatisect ......................................................... 20. S. leucoma

27b. Leaves denticulate, dentate, or pinnately lobed.

28a. Rosette and lower stem leaves abaxially often reddish, glabrous; stem leaves erect or spreading; capitula solitary or 2–5; involucre 1–2 cm in diam. ........................................... 18. S. paxiana

28b. Rosette and lower stem leaves abaxially dark green, arachnoid; stem leaves reflexed; capitula numerous (8–20); involucre 0.4–0.9 cm in diam.

29a. Plants not caespitose; leaves elliptic, to 3 cm; upper stem leaves arachnoid; achene glabrous ......................................................... 17. S. georgei

29b. Plants usually caespitose; leaves narrowly elliptic to linear, to 6 cm; upper stem leaves densely white lanate; achene sparsely papillose ......................................... 21. S. simpsoniana


湿地雪兔子 shì dì xuě tù zǐ

Herbs 40–90 cm tall, perennial, polycarpic. Caudex stout, simple or few branched. Stem solitary, 5–7 mm in diam., erect, simple or apically branched. Basal and lower stem leaves sessile, narrowly ovate-elliptic to linear, 20–30(–40) × 0.8–4 cm, abaxially light green, gland-dotted, and thinly tomentose but glabrescent, adaxially dark green and sparsely pilose but glabrescent, margin remotely denticulate, apex acuminate. Middle and upper stem leaves narrowly elliptic to linear, 8–20 × 1–2.5 cm. Uppermost stem leaves linear, 4–8 × 0.2–1.2 cm. Capitula 6–17, in a densely congested or laxly corymbiform synflorescence, sessile or pedunculate. Involucre obovoid to globose, (0.8–)1–1.3 cm in diam. Phyllaries in 5 or 6 rows; outer phyllaries triangular-ovate, (7–)10–17 × 2–3.5 mm, apex long acuminate; middle phyllaries narrowly ovate, 6–8 × 1.5–2.5 mm, apex acute to obtuse; inner phyllaries linear, 9–10 × 1–1.5 mm, apex obtuse. Receptacle bristles 6–7 mm. Corolla blackish purple, 1–1.1 cm, tube 5–6 mm, limb 5–5.5 mm, lobes 2.5–3 mm. Achene (ripe) unknown. Pappus light brown; outer bristles 2–3 mm; inner bristles 8–9 mm. Fl. and fr. Jul–Aug.
Herbs 10–20 cm tall, perennial, polycarpic. Caudex stout, simple or few branched, covered with remains of petioles. Stem solitary, 4–6 mm in diam., erect, simple. Basal and lower stem leaves petiolate; petiole to 4 cm; leaf blade linear, 5–18 × 0.2–0.8 cm, abaxially light or grayish green, sericeous, tomentose, and gland-dotted, adaxially dark green and glabrous or sericeous-villous, margin slightly revolute and entire or denticulate, apex acuminate. Middle and upper stem leaves sessile, linear, 5–10 × 0.2–0.8 cm. Uppermost stem leaves stellately arranged, overtopping synflorescence, narrowly triangular-linear, 1.5–6 × 0.4–0.8 cm, apex acuminate. Capitula 10–15, in a hemispheric synflorescence 3–6 cm in diam., sessile. Involucrre campanulate, 0.8–1.2 cm in diam. Phyllaries in 4 or 5 rows, blackish, apex caudate to acuminate; outer phyllaries narrowly triangular-ovate, 9–11 × 2.5–3 mm; middle phyllaries narrowly elliptic, 7–9 × 2–2.5 mm; inner phyllaries linear, 8–9 × 1–1.5 mm. Receptacle bristles 5–6 mm. Corolla bluish purple, 7–9 mm, tube 4–5 mm, limb 3–4 mm, lobes ca. 2 mm. Achene dark brown, obconic, 3–5 mm, smooth, glabrous. Pappus brown; outer bristles 2–4 mm; inner bristles 6–7 mm. Fl. and fr. Aug–Sep.

1a. Leaves adaxially glabrous; basal leaves usually less than 5 mm wide 

b. Leaves adaxially sericeous-villous; basal leaves usually more than 5 mm wide

1a. var. uliginosa

1b. var. vittifolia

1b. var. hirsuta

3a. var. delavayi

3b. var. hirsuta (J. Anthony) Handel-Mazzetti, stat. nov.

**Saussurea erecta** S. W. Liu, J. T. Pan & J. Quan Liu.

Herbs 2–15(–25) cm tall, biennial or annual, monocarpic. Stem solitary, 2–4 mm in diam., sometimes erect, diffusely branched from base, apically branched or stem almost absent. Rosette leaves petiolate; petiole 0.5–5 cm; leaf blade narrowly oblong-elliptic to linear, 2–14 × 0.3–1.7 cm, pinnately lobed, both surfaces green, abaxially gland-dotted and arachnoid tomentose but glabrescent, axially sparsely arachnoid and gland-dotted, apex mucronate; lateral lobes 5–10 pairs, margin dentate or entire. Capitula 8–25, in a corymbiform synflorescence 3–15 cm in diam.; peduncle 0.3–1 cm. Involucre narrowly campanulate, 7–10 mm in diam. Phyllaries in 3 or 4 rows, apically purplish, arachnoid, gland-dotted, apex acute and mucronate; outer phyllaries ovate to narrowly ovate-elliptic, 6–9 × 3–3.5 mm, appendage rhombic-spatulate and tridentate; and inner phyllaries narrowly oblong-elliptic, 5.5–9 × 1.5–2.5 mm. Receptacle without bristles. Corolla purplish red, rose to bluish purple, obconic, 2–3 mm, wrinkled, glabrous, apex with a few-dentate ca. 1 mm crown to 2 mm. Pappus pale brown; outer bristles 2–4 mm; inner bristles (6–)8–10 mm. Fl. and fr. Jul–Sep. 2n = 32*.

- Sandy river edges and mountain slopes, sand dunes; 2900–5000 m. Xizang.

**Saussurea erecta**, described from a single specimen, differs from *S. kingii* only by its more erect habit and glabrous achenes. *Saussurea kingii* is variable in growth habit, and glabrous achenes have been observed in some specimens of *S. kingii* as well. As long as these characters are not found to be stable in a larger population, we regard *S. erecta* as synonymous with *S. kingii*.

5. **Saussurea thoroldii** Hemsley, J. Linn. Soc., Bot. 30: 115. 1894.


**Saussurea thomsonii** C. B. Clarke, Compos. Ind. 227. 1876.


**Saussurea grandiceps**, described from a single specimen, differs from *S. kingii* only by its more erect habit and glabrous achenes. *Saussurea kingii* is variable in growth habit, and glabrous achenes have been observed in some specimens of *S. kingii* as well. As long as these characters are not found to be stable in a larger population, we regard *S. erecta* as synonymous with *S. kingii*.


**Saussurea stella**, described from a single specimen, differs from *S. kingii* only by its more erect habit and glabrous achenes. *Saussurea kingii* is variable in growth habit, and glabrous achenes have been observed in some specimens of *S. kingii* as well. As long as these characters are not found to be stable in a larger population, we regard *S. erecta* as synonymous with *S. kingii*.

8. **Saussurea thomsonii** C. B. Clarke, Compos. Ind. 227. 1876.
Saussurea acutilis Klatt; *S. amblyphylla* C. Winkler.

Herbs 1–4 cm tall, perennial, monocarpic, stemless. Taproot 1–2 mm in diam. Caudex short, with brown remains of petioles. Rosette leaves petiolate; petiole 5–10(–30) mm, basally widened; leaf blade elliptic, ovate, or spatulate, 1–3 × 0.5–1.7 cm, fleshy but leathery and rigid when dry; both surfaces green, abaxially glabrous, adaxially sparsely arachnoid but glabrescent, base cuneate-attenuate, margin crenulate to subentire, apex obtuse, rounded, or rarely acute. Uppermost leaves suborbicular. Capitula 2–10, in center of rosette, in a hemispheric synflorescence 1.5–3 cm in diam., sessile. Involucre campanulate, (6–)8–10 mm in diam. Phyllaries in 3 or 4 rows, membranous, purplish red, glabrous, apex obtuse to rounded; outer phyllaries elliptic to obovate, 5–6(–8) × 2.5–3 mm; middle phyllaries obovate, 6–7 × 2.5–3 mm; inner phyllaries narrowly elliptic, 7–8 × 1.5–2 mm. Receptacle bristles brown, 0.2–0.8 mm. Corolla bluish purple, 6–7 mm, tube 3–3.5 mm, apex obtuse to rounded; inner phyllaries narrowly oblong to linear, 7–9 × 1–2 mm, glabrous. Pappus yellowish brown, in 1 row; bristles dirty white, 3–4 mm; inner bristles brown, 7–8 mm. Fl. and fr. Jun–Aug.

High mountain pastures and meadows by rivers and lakes, marshlands; 4000–5200 m. Qinghai, S Xinjiang, Xizang [NW India, Kashmir].


羌塘雪兔子 qiang tang xue tu zi

*Saussurea hyperiophora* Handel-Mazzetti.

Herbs 2–7 cm tall, perennial, monocarpic, stemless or shortly stemmed. Taproot conic, fleshy. Rosette leaves shortly petiolate; leaf blade obovate, spatulate, or suborbicular, 1–3 × 0.5–1.4 cm, abaxially sparsely whitish lanate but glabrescent, adaxially densely lanate with yellowish brown or whitish articulate matted hairs in basal part but arachnoid floccose and glabrescent in apical part, base cuneate-attenuate, margin entire or sparsely denticulate, apex rounded to obtuse. Capitula numerous, in center of leaf rosette, in a hemispheric synflorescence 2–4 cm in diam., sessile. Involucre cylindric to campanulate, 4–8 mm in diam. Phyllaries in ca. 3 rows, subequal, apex acuminate; outer phyllaries narrowly ovate-oblong, 8–9 × 2–3 mm, herbaceous, apically densely yellowish brown lanate; middle and inner phyllaries narrowly oblong to linear, 7–9 × 1–2 mm, light brown, scarious, glabrous. Receptacle without bristles. Corolla rose-purple to purplish red, 9–10(–13) mm, tube 3.5–4 mm, limb 5–6 mm, lobes 2–2.5 mm. Achene (ripe) unknown, ca. 4 mm, glabrous. Pappus yellowish brown, in 1 row; bristles plumose, 0.9–1.1 cm. Fl. and fr. Aug–Sep.

Alpine scree slopes; 3900–5400 m. Qinghai, W Sichuan, Xizang [NW India, Kashmir].


冰川雪兔子 bing chuan xue tu zi

*Saussurea chtonocephala* Bornmüller; *S. pamirica* C. Winkler; *S. violacea* Pampanini.

Herbs 2–6(–10) cm tall, perennial, polycarpic, shortly stemmed. Caudex slender, branched, with several leaf rosettes and flowering stems, covered with remains of petioles. Stem solitary, 1–3 mm in diam., erect, simple. Rosette and stem leaves shortly petiolate; leaf blade narrowly elliptic to obovate, 1.5–4 × 0.4–1 cm, abaxially white lanate, adaxially yellowish or white lanate, base cuneate-attenuate, margin crenate or entire, apex obtuse. Capitula 3–15, in a hemispheric synflorescence
1.5–4 cm in diam., sessile. Involucre cylindric to narrowly campanulate, (5–)7–10 mm in diam. Phyllaries in 3 or 4 rows, scariosus, apically purple or blackish, apex acute to acuminate; outer phyllaries narrowly ovate-elliptic, 9–13 × 2.5–3 mm, apically lanate; middle phyllaries narrowly oblong, 8–13 × 1.5–2.5 mm; inner phyllaries narrowly elliptic to linear, 9–13 × 1–1.5 mm, glabrous. Receptacle bristles white, 0.5–2.5 mm. Corolla purple, 9–10 mm, tube 3–4 mm, limb 6–6.5 mm, lobes 2–2.5 mm. Achene cylindric to obconic, 3–4 mm, glabrous. Pappus in 2 rows; outer bristles dirty white, 2–5 mm, scabrid to plumose, sometimes lacking; inner bristles basally brown, apically dirty white, 8–11 mm. Fl. and fr. Jul–Aug.

Alpine scree slopes; 3800–5200 m. Qinghai, Xinjiang, Xizang [E Afghanistan, NW India, Kashmir, E Kazakhstan, Kyrgyzstan, Mongolia, N Pakistan, Russia (Siberia), Tajikistan].


黑毛雪兔子 hei mao xue tu zi


Herbs 3–15 cm tall, perennial, polycarpic, sometimes caespitose. Caudex simple or branched at ground level. Stem solitary, 2–5 mm in diam., erect, simple. Rosette and lower stem leaves long petiole; petiole green; leaf blade narrowly obovate-spatulate, elliptic, or oblong, 1–3 × 0.3–1 cm, both surfaces green but sometimes tinged purple and glabrous or sparsely white arachnoid, base attenuate, margin obtusely dentate or entire, apex obtuse. Upper stem leaves sessile, narrowly triangular-ovate, usually reflexed, both surfaces white and blackish lanate, margin crenate or entire, apex obtuse to acuminate. Capitula 5–15, in a hemispheric synflorescence 2–4 cm in diam., sessile. Involucre cylindric, 5–6 mm in diam. Phyllaries in ca. 3 rows, membranous; outer phyllaries narrowly elliptic-linear, 8–9 × 1.5–2 mm, densely black and white lanate, apex subacute; middle and inner phyllaries obovate-elliptic, 8–9 × 2–3 mm, apex acute. Receptacle bristles 0.5–1.5 mm. Corolla rose-purple, 7–8(–9) mm, tube 3–4(–5) mm, limb 3.5–4(–5) mm, lobes 2–2.5 mm. Achene brown, cylindric to obconic, 4–5 mm, smooth, glabrous. Pappus mouse-gray to blackish; outer bristles 2–4 mm, sometimes reflexed; inner bristles 8–9 mm. Fl. and fr. Jun–Sep.

Alpine scree slopes; 2700–5800 m. Gansu, Qinghai, W Sichuan, S and W Xinjiang, Xizang [NE Afghanistan, NW India, Kashmir, E Kazakhstan, Kyrgyzstan, W Nepal, N Pakistan, Tajikistan].

The basionym was not validly published by Royle (Ill. Bot. Himal. Mts. 251, t. 59, f. 1. 1835). There was no written description or diagnosis, or reference to such, and the illustration was lacking an analysis (Vienna Code, Art. 32.1d), (44.1, 42.4).


武素功雪兔子 wu su gong xue tu zi

Herbs 1.5–2 cm tall, perennial, polycarpic, almost stemless. Caudex slender, trailing, usually branched, usually with several sterile leaf rosettes and flowering stems, apically covered with remains of petioles. Rosette leaves petiole; petiole purple, base widened; leaf blade ovate, fan-shaped, spatulate, or orbicular, (1–)3–10 × (1–)2–7 mm, abaxially grayish green and densely arachnoid tomentose, adaxially green and sparsely arachnoid or glabrous, base cuneate, margin entire or crenulate, apex rounded. Capitula 3–8, terminal in center of leaf rosette, in a hemispheric synflorescence 1–2.5 cm in diam., sessile. Involucre narrowly campanulate, 3–5 mm in diam. Phyllaries in 2 or 3 rows, membranous, apically purple or brown, apex acute to acuminate and dentate; outer phyllaries narrowly elliptic-oblong, 6–7 × 2–3 mm, apically sparsely arachnoid; middle and inner phyllaries narrowly elliptic to narrowly obovate, 6–8 × 1–
Herbs 4–15(–22) cm tall, perennial, polycarpic. Caudex 3–5 mm in diam., creeping, branched, with sterile leaf rosettes and flowering stems. Stem solitary, 0.5–1.5 cm in diam., erect, simple, hidden by reflexed leaves. Rosette and lower stem leaves petiolate; leaf blade elliptic to narrowly elliptic, 0.8–4.5(–8) × 0.5–1.5 cm, abaxially white or yellowish lanate, base purplish and widened, apex obtusely dentate to pinnately divided, apex acute to obtuse. Upper stem leaves oblong to linear, 1–5 × 0.2–0.8 cm, abaxially and basally densely lanate, adaxially glabrous. Pappus pale yellowish brown, in 1 row; bristles 6–7 mm, plumose. Fl. Jul–Aug.

● Scree slopes, gravelly or sandy areas; 4800–5200 m. SE Xinjiang (Ruqiang).


・ 楝叶雪兔子 hu ye xue tu zi

Saussurea chionophora Handel-Mazzetti; S. hypsipeta Diels; S. quercifolia var. major J. Anthony.

Herbs 4–15 cm tall, perennial, polycarpic. Caudex 3–5 mm in diam., creeping, branched, with sterile leaf rosettes and flowering stems. Stem solitary, 0.5–1.5 cm in diam., erect, simple, hidden by reflexed leaves. Rosette and lower stem leaves petiolate; leaf blade elliptic to narrowly elliptic, 0.8–4.5(–8) × 0.5–1.5 cm, abaxially whitish with dark veins, tomentose, and gland-dotted, adaxially green and sparsely arachnoid, base cuneate-attenuate, margin obtusely dentate to pinnately divided, apex acute to obtuse. Upper stem leaves oblong to linear, 1–5 × 0.2–0.8 cm, abaxially and basally densely lanate, adaxially glabrescent, margin pinnately divided or entire, apex acuminata. Capitula 10–20, in a hemispheric synflorescence 2.5–4 cm in diam., sessile. Involucre narrowly campanulate, 7–9 mm in diam. Phyllaries in 3 or 4 rows, light brown but apically blackish purple, margin hyaline; outer phyllaries ovate-oblong, 14–15 × 4–4.5 mm, apically arachnoid, apex acuminata; middle and inner phyllaries narrowly elliptic, (13–)15–16 × 3–4 mm, glabrous, apex acute. Receptacle bristles straw-colored, 4–5 mm. Corolla purplish red, 1.2–1.4 cm, tube 6–7 mm, limb 6–7 mm, lobes 3–3.5 mm. Achene brown, cylindric, 5–6 mm, smooth, glabrous. Pappus light brown; outer bristles few, 1.5–4 mm, scabrid or smooth, sometimes lacking; inner bristles 1.2–1.3 cm. Fl. and fr. Jul–Aug.

● Alpine scree slopes; 3400–5300 m. S Qinghai (Yushu), SW and W Sichuan (Litang, Muli), ?Xizang, NW Yunnan (Dêqên, Zhongdian).


・ 红叶雪兔子 hong ye xue tu zi

Herbs 5–15 cm tall, perennial, polycarpic. Caudex 1–4 mm in diam., branched, with sterile leaf rosettes and flowering stems. Stem solitary, 2–3 mm in diam., erect, simple. Rosette and lower stem leaves distinctly petiolate; leaf blade obovate, elliptic, ovate, or orbicular, 1.5–10 × 0.5–3(–5) mm, green but becoming purplish red, abaxially usually reddish and glabrous, adaxially sparsely white arachnoid but glabrescent, base cuneate-attenuate, margin dentate, apex rounded to acuminate. Uppermost stem leaves sessile, narrowly elliptic to linear, both surfaces white and brownish lanate, apex acuminata and usually reflexed. Capitula (1 or)2–5(–13), in a hemispheric synflorescence 2–5 cm in diam. or rarely solitary, sessile. Involucre campanulate, 1–1.5(–2) cm in diam. Phyllaries in ca. 4 rows, straw-colored, apically white and brown lanate, apex acuminata; outer phyllaries narrowly triangular-ovate, 10–12(–18) × 3–4 mm; middle and inner phyllaries narrowly elliptic-linear, 12–14(–18) × 1.5–3 mm. Receptacle bristles filiform, to 1 mm. Corolla dark red or pink, 1.2–1.7 cm, tube 6–11 mm, limb 6–7 mm, lobes 3–4 mm. Achene ivory-colored, cylindric, (5–)7–8 mm, 5-ribbed, smooth, glabrous. Pappus straw-colored; outer bristles 0.5–1.5 mm; inner bristles 1–1.3(–1.6) cm. Fl. and fr. Jun–Sep. 2n = 28*.

・ Alpine scree slopes and meadows; 3500–5000 m. Gansu, Qinghai, W Sichuan, E Xizang, NW Yunnan.


・ 加查雪兔子 jia cha xue tu zi

Herbs 6–10 cm tall, perennial, polycarpic, caespitose. Caudex slender, branched, with several sterile leaf rosettes and flowering stems. Stem solitary, 2–5 mm in diam., erect or ascending, simple. Rosette and lower stem leaves petiolate; leaf blade spatulate to linear, 0.4–2 × 0.5–1.1 cm, white lanate, base attenuate, margin entire or crenate, apex obtuse to acuminate. Upper stem leaves linear, 1.5–3 × 0.2–0.3 cm, both surfaces densely white or yellowish lanate, margin entire or apically lobed, apex acuminata. Uppermost stem leaves narrowly triangular to linear, 1.5–3 × 0.2–0.3 cm, reflexed, both surfaces densely white or yellowish lanate, base purplish and widened, margin entire, apex acuminata. Capitula numerous, in a hemispheric synflorescence 3.5–4.5 cm in diam., sessile. Involucre
cylindric, ca. 5 mm in diam. Phyllaries in several rows, narrowly obovate-linear, 1–1.4 cm, dark purple, subglabrous, apex acute. Receptacle without bristles. Corolla bluish purple, ca. 1.2 cm, tube 6–7 mm, limb ca. 5 mm, lobes ca. 2 mm. Achene black, 6–6.5 mm. Pappus pale brown, in 1 row; bristles ca. 1.1 mm, plumose. Fl. and fr. Jul–Aug.

- Alpine scree slopes; ca. 4800 m. Xizang (Gyaca).

_Saussurea gyacensis_ is known only from the type collection.


_羽裂雪兔子_ yu lie xue tu zi

_Saussurea franchetiana_ H. Léveillé.

Herbs 10–18 cm tall, perennial, monopodial. Caudex to 2 cm in diam., unbranched. Stem solitary, erect, simple, hidden by leaves. Lower and middle stem leaves petiolate; leaf blade narrowly elliptic, 3–5 × 0.5–2.5 cm, pinnatisect, abaxially grayish white, arachnoid tomentose to lanate, and gland-dotted, adaxially green and arachnoid to glabrescent; lobes 5–10 pairs, linear, 5–10 × 1–2 mm, margin entire, apex acute. Uppermost stem leaves sessile, linear, 2–3 × 0.1–0.2 cm, reflexed, both surfaces densely yellowish white lanate, margin entire, apex acute. Capitula numerous, in a hemispheric synflorescence 4–6 cm in diam., sessile. Involucre cylindric, 0.5–0.8 mm in diam. Phyllaries in 3 or 4 rows; outer phyllaries narrowly triangular-ovate, 10–15 × 3–5 mm, apically yellowish lanate, apex acuminate; middle and inner phyllaries narrowly elliptic to linear, 9–15 × 2–3 mm, apically sparsely pilose, margin membranous, apex acute. Receptacle bristles brown, 1–3 mm. Corolla blackish purple, 1–1.4 cm, tube 7–8 mm, limb 6–7 mm, lobes 2–3 mm. Achene black, obconic, 4–5 mm, smooth, glabrous. Pappus straw-colored; outer bristles 3–4 mm; inner bristles 1–1.3 cm. Fl. and fr. Aug–Oct.

- Alpine scree slopes; 3200–5300 m. SW Sichuan (Muli), SE Xizang, NW Yunnan (Dêqên, Lijiang, Zhongdian).


_小果雪兔子_ xiao guo xue tu zi

_Aplotaxis simpsoniana_ Fielding & Gardner, Sert. Pl. t. 26. 1844; _A. gossypina_ Candolle var. minor Candolle; _Saussurea sacra_ Edgeworth; _S. yushuensis_ S. W. Liu & T. N. Ho.

Herbs 10–18 cm tall, perennial, monocarpic. Caudex to 2 cm in diam., unbranched. Stem solitary, erect, simple, hidden by reflexed leaves. Rosette and lower stem leaves petiolate; leaf blade narrowly elliptic to linear, 9–10 × 1.5–2 mm, apically sparsely pilose. Receptacle bristles ca. 1.5 mm. Corolla purple, 0.9–1.1 cm, tube 3.5–5 mm, limb 5.5–6 mm, lobes 2–3 mm. Achene brown, 2–3 mm, wrinkled, apically sparsely papillose. Pappus straw-colored; outer bristles ca. 3 mm; inner bristles ca. 1 cm. Fl. and fr. Aug–Sep. 2n = 32.

- Alpine scree slopes; 3700–5800 m. S Qinghai (Chindu, Nangqên), SW Xinjiang (Taxkorgan), S and SW Xizang (Burang, Yadong, Zhongba) [?Bhutan, NE and NW India, Kashmir, Nepal].

The characters that were used to distinguish _Saussurea yushuensis_ from _S. simpsoniana_ fall within the range of the latter, which has a large distribution area and exhibits a considerable morphological variability.


_三指雪兔子_ san zhi xue tu zi

Herbs 8–15[–20] cm tall, perennial, polycarpic. Caudex usually branched. Stem solitary, 3–8 mm in diam., erect, simple, hidden by reflexed leaves. Rosette and lower stem leaves petiolate; leaf blade spatulate, 5–25 × 2–6 mm, both surfaces grayish green and densely white or yellowish lanate, margin apically 3–6-lobed, apex obtuse to rounded. Middle and upper stem leaves narrowly spatulate to linear, 1–3(–4.5) × 0.3–0.7(–1) cm, margin apically 2–6-lobed or entire, apex obtuse to rounded. Capitula usually numerous, in a hemispheric synflorescence 2–3(–5.5) cm in diam., or rarely solitary, sessile. Involucre oblong to cylindric, 3.5–4(–8) mm in diam. Phyllaries in 3 or 4 rows, linear-oblong, 9–13 × 1.5–3 mm, subbequall, apex acute; outer phyllaries densely villous; middle and inner phyllaries membranous, apically sparsely pilose. Receptacle bristles 0.2–0.5(−1.5) mm. Corolla dark to blackish purple, 1–1.4 cm, tube 5–7.5 mm, limb 5–6 mm, lobes 1.5–2.7 mm. Achene brown, cylindric to obconic, [3.2–5]–7 mm, smooth, glabrous. Pappus straw-colored to light brown; outer bristles thin, plumose, 2–4 mm; inner bristles 1–1.2 cm. Fl. and fr. Aug–Sep. 2n = 36*.

Alpine scree slopes, among boulders, grasslands on mountain slopes; 4300–5300 m. S Xizang [Bhutan, India (Sikkim), Nepal].

- Alpine scree slopes, among boulders, grasslands on mountain slopes; 4300–5300 m. S Xizang [Bhutan, India (Sikkim), Nepal].

22a. **Saussurea tridactyla** var. _tridactyla_.

_三指雪兔子_ (原变种) san zhi xue tu zi (yuan bian zhong)

Plants with a single flowering stem. Capitula numerous in a hemispheric synflorescence. Involucre oblong.

- Alpine scree slopes, among boulders, grasslands on mountain slopes; 4300–5300 m. S Xizang [Bhutan, India (Sikkim), Nepal].


_从株雪兔子_ cong zhu xue tu zi

Plants caespitose, with several flowering stems. Capitulum solitary. Involucre hemispheric.

Herbs 6–20 cm tall, perennial, polycarpic. Caudex 3–8 mm in diam., usually branched. Stem solitary, 0.5–1.5 cm in diam., erect, simple, hidden by reflexed leaves. Rosette and lower stem leaves petiolate; leaf blade obovate, fan-shaped, rhombic, or orbicular, 1–7.5 × (0.5–)1–5 cm, both surfaces grayish green and white or yellowish arachnoid lanate, margin dentate to pinnately lobed, apex obtuse. Middle and upper stem leaves ovate-elliptic, pinnately lobed or divided, both surfaces densely lanate, apex acute to acuminate. Uppermost stem leaves narrowly ovate to linear, both surfaces densely lanate, margin dentate. Capitula numerous, in a hemispheric synflorescence 3–7 cm in diam., sessile. Involute cylindric, 5–8 mm in diam. Phyllaries in 3 or 4 rows; outer phyllaries narrowly ovate-triangular, 1.5–2.5 × 0.5–0.6 cm, apically white or brown lanate, apex caudate; middle and inner phyllaries narrowly obovate-oblong, 10–14 × 1–4 mm, glabrous, rounded and ciliate. Receptacle bristles 0.5–2 mm. Corolla bluish purple, sparsely pilose or glabrous, margin sparsely dentate or entire. Involucre cylindrical, 5–8 mm in diam., erect, simple, hidden by reflexed leaves. Rosette and stem leaves petiolate; leaf blade spatulate, obovate, or elliptic, 8–15 × 7–8 mm, both surfaces yellowish green and white or yellowish arachnoid lanate, margin in shapes of petioles. Rosette and stem leaves petiolate; leaf blade narrowly fusiform, 8–10 mm in diam., sessile. Involucre cylindric, 5–6 mm in diam. Phyllaries in 3 or 4 rows, hyaline, apically purplish red, glabrous but apically ciliate, apex acute; middle and upper phyllaries narrowly spatulate-linear, 10–11 × ca. 3 mm; middle and inner phyllaries linear, 13–14 × 1–2 mm. Receptacle bristles 1.5–2.5 mm. Corolla dark purple, densely papillose, 1.1–1.3 cm, tube 6–7 mm, limb 5–6 mm, lobes 1.5–2 mm. Achene brown, narrowly fusiform, 7–8 mm, densely papillose on apical rim. Pappus dirty white; outer bristles 5–8 mm; middle and inner bristles 1.2–1.3 cm. Fl. and fr. Aug–Sep. Alpine scere slopes; ca. 4900–5200 m. SC Xizang (Lhasa) [W Nepal].

Saussurea namikawae from Nepal is very close to S. medusa, from which it is said to differ mainly by dense papillae on the corolla limb and on the apical rim of the achene; however, this kind of papillae is sometimes present in S. medusa as well. A specimen from C Xizang (Ludlow & Sherriff 9066) additionally differs from S. medusa by its much narrower leaves, which approach those of S. tridactyla in shape and color. This plant is therefore tentatively included here as S. namikawae.


Herbs 15–45 cm tall, perennial, monocarpic. Caudex to 2 cm in diam., unbranched. Stem solitary, to 2 cm in diam., erect, simple, hidden by leaves, basally covered with fibrous remains of petioles. Rosette and stem leaves petiolate; leaf blade narrowly obovate-elliptic, 5–15 × 1–2 cm, both surfaces green or blackish purple, abaxially brownish white tomentose, adaxially arachnoid in basal part but glabrous in apical part, margin dentate, apex acute. Uppermost stem leaves narrowly ovate-elliptic to linear, 3–6 × 0.2–0.5 cm, both surfaces densely yellowish white or blackish lanate, margin entire, apex acute. Capitula numerous, in an interrupted spiciform synflorescence to 8 cm in diam., hidden in lanate indumentum, pedunculate. Involucre campanulate, 1.5–2 cm in diam. Phyllaries in 3 or 4 rows, apically lanate, apex acuminate-caudate; outer phyllaries subulate, 2–2.5 × 0.2–0.3 cm; middle and inner phyllaries subulate-linear, 15–20 × 1–2 mm. Receptacle bristles 1–2 mm. Corolla dark purple, 0.9–1.3 cm, tube 1.5–3 mm, limb 7–8 mm, lobes 1.5–3 mm. Achene dark brown, obconic, 2.5–3(–5.5) mm, smooth, glabrous. Pappus light brown or blackish; outer bristles 2–5 mm; inner bristles 1–1.2 cm. Fl. and fr. Aug–Oct.

Alpine scere slopes; 3200–5500 m. SW Sichuan, SE Xizang, NW Yunnan [India (Sikkim), 'N Yugoslavia.

The whole plant of Saussurea medusa is used medicinally.


The whole plant of Saussurea laniceps is used medicinally, and the species is threatened in many regions by over-collecting.


Alpine scere slopes; 4600–4700 m. SC Xizang (Lhasa) [W Nepal].

Saussurea gossipiphora var. maiduoganla Pampanini; Aplotaxis gossipiphora (Wallich) Candolle; Saussurea gossipiphora var. liliputa Lipschitz; S. gossipiphora subsp. luxuriosa Lipschitz; S. gossipiphora Wallich.

Herbs 9–30–48 cm tall, perennial, monocarpic. Caudex unbranched. Stem solitary, ca. 1 cm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade linear-oblong to narrowly obovate, 5–22 × 0.6–2.8 cm, both surfaces green and sparsely pilose or glabrous, margin sparsely denticulate, apex acute. Middle and upper stem leaves sessile, narrowly ovate-elliptic to linear, gradually smaller upward on stem, both surfaces densely white or pale yellowish lanate, apex acute or acuminate. Capitula numerous, densely clustered on flat stem apex in a synflorescence 4–7–10 cm in diam., hidden at anthesis in shape as well. A specimen from C Xizang (Ludlow & Sherriff 9066) additionally differs from S. medusa by its much narrower leaves, which approach those of S. tridactyla in shape and color. This plant is therefore tentatively included here as S. namikawae.


The whole plant of Saussurea medusa is used medicinally, and the species is threatened in many regions by over-collecting.
a lanate indumentum, sessile. Involucre cylindric to campanulate, 5–10 mm in diam. Phyllaries in 3–6 rows, apex acute; outer phyllaries ovate, ca. 4 × 3 mm; inner phyllaries narrowly ovate-elliptic to linear, ca. 7.5 × 1.5 mm. Receptacular bristles ca. 2 mm. Corolla bright purple to reddish purple, 7–12.5 mm, tube 2–5.5 mm, limb 5–7 mm, lobes 1.5–2 mm. Achene cylindric, 2–4.5 mm, apically sparsely papillose or glabrous. Pappus pale brown; outer bristles 4–5 mm; inner bristles 8–10 mm. Fl. and fr. Aug.–Oct. 2n = 36.

Alpine scree slopes, rock crevices; 4200–5000 m. S Xizang (Yadong), ?Yunnan [Bhutan, NE and NW India, ?Kashmir, Nepal].

The whole plant of *Saussurea gossipiphora* is used medicinally.

No specimens of *Saussurea gossipiphora* from China were seen by the present authors, and this description is based on material from outside the Flora area and on the revision by Fujikawa (Makinoa, n.s., 8: 46–51. 2010). The record from Yunnan relies only on a picture, which was not seen by the authors, and not on an actual specimen. Also, from a chorological point of view, such a record is improbable and is probably due to a confusion with *S. laniceps*.


须弥雪兔子 xu mi xue tu zi

Herbs 9–30 cm tall, perennial, monoparous. Caudex branched. Stem solitary, ca. 6.5 mm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade narrowly elliptic to oblong, 3.5–11.5 × 0.8–2.5 cm, both surfaces dark reddish green to blackish purple and arachnoid, margin dentate, apex acute. Upper stem leaves linear, both surfaces densely white lanate, margin entire, apex acute. Capitula numerous, densely clustered on flat stem apex in a synflorescence ca. 4 cm in diam., hidden at anthesis in a lanate indumentum, sessile. Involucre cylindric, 5–6 mm in diam. Phyllaries in 3 or 4 rows, membranous; outer phyllaries spatulate to narrowly obovate, 8–8.5 × ca. 2.5 mm, densely pilose and glandular, apex aciculate; inner phyllaries narrowly ovate to linear, 8–8.5 × ca. 1.5 mm, sparsely pilose, apex acute to apiculate. Receptacle densely papillose; papillae ca. 0.5 mm. Corolla bright purple to reddish purple, 1–1.3 cm, glabrous, tube 5.5–6.5 mm, limb 4.5–6.5 mm, lobes 1.5–2 mm. Achene purplish black, cylindric, 4–7 mm, densely papillose. Pappus dirty white; outer bristles ca. 5 mm; inner bristles 1.5–2.5 mm. Fl. and fr. Aug.–Sep. 2n = 36*.


错那雪兔子 cuo na xue tu zi


Herbs 12–20[–30] cm tall, perennial, monoparous. Caudex unbranched. Stem solitary, ca. 1 cm in diam., erect, simple. Lower and middle stem leaves petiolate; leaf blade narrowly ovate or narrowly oblong, 5–10[–17] × [0.5–]1–2[–3] cm, both surfaces green and sparsely arachnoid but glabrescent, margin sinuate-dentate, apex obtuse to acute. Upper stem leaves linear, 2–5 × 0.5–1.5 cm, both surfaces purplish black and densely white lanate, margin entire, apex acute to acuminate. Capitulum solitary, on flat stem apex, sessile, hidden at anthesis by lanate indumentum. Involucre broadly campanulate, [1–]2–3–6[–7] cm in diam. Phyllaries not seen. Receptacle without bristles or papillae. Corolla bright purple to purple, 7–12.5 mm, tube 2–5 mm, limb 5–7.5 mm. Achene cylindric, 3–5 mm, smooth, glabrous. Pappus dirty white; outer bristles ca. 5 mm; inner bristles ca. 1 cm. Fl. and fr. Aug.– Sep.

Alpine scree slopes; 4000–4700 m. S Xizang (Cona) [Bhutan].


藏南雪兔子 zang nan xue tu zi

Herbs 4–20 cm tall, perennial, monoparous. Caudex unbranched. Stem solitary, 8–10 mm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade narrowly ovate-oblong to linear, 4.5–16 × 0.5–1.5 cm, both surfaces green and sparsely pilose or glabrous, margin sparsely dentate to pinnately lobed, apex aciculate. Upper stem leaves sessile, linear, both surfaces purplish black and densely white lanate, margin sparsely denticulate, apex acute. Capitula numerous, loosely clustered on obovoid stem apex in a synflorescence 3–4.5 cm in diam., hidden at anthesis in a lanate indumentum, very shortly pedunculate. Involucre campanulate, ca. 1 cm in diam. Phyllaries in 3 or 4 rows, margin membranous, apex acute; outer phyllaries narrowly ovate, ca. 13 × 3 mm, apically blackish purple, densely pilose and glandular; inner phyllaries narrowly ovate to linear, ca. 1.5–2.5 mm, apically densely pilose. Receptacle bristles ca. 1.5 mm. Corolla bright purple to reddish purple, 7–8.5 mm, tube 2.5–3.5 mm, limb 4.5–5 mm, lobes 1.3–2 mm. Achene ca. 2.5 mm, wrinkled, sparsely papillose. Pappus dirty white; outer bristles ca. 4 mm; inner bristles ca. 8 mm. Fl. and fr. Aug.–Sep. 2n = 32.

Alpine meadows, sandy or stony places, scree slopes; 4500–5200 m. S Xizang [Bhutan, NW India, Nepal].

No specimens of *Saussurea topkegolensis* were seen by the present authors. This treatment is based on the original description and on the revision by Fujikawa (Makinoa, n.s., 8: 66–67. 2010).


定日雪兔子 ding ri xue tu zi

Herbs 10–30 cm tall, perennial, polycarpic, caespitose. Caudex branched. Stem solitary, 3–15 mm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade spatulate, narrowly elliptic, or oblong, 2–25 × 0.5–2.8 cm, both surfaces green and sparsely pilose or glabrous, margin dentate, apex acute. Upper stem leaves sessile, gradually shorter upward on stem. Capitula densely clustered on flat stem apex in a synflorescence 1.3–5.5 cm in diam., hidden at anthesis in a lanate indumentum, sessile. Involucre tubular, 0.5–1.5 cm in diam. Phyllaries in 1 row, narrowly elliptic to linear,
5–9.5 × 0.5–1.5 mm, apically pilose and glandular, margin membranous, apex acute. Receptacle sparsely papillose; papil-
lae ca. 0.3 mm. Corolla pale purple to bright purple, 0.8–1.2
cm, tube 1.5–4 mm, limb 5.5–8.5 mm, lobes 1.5–2.5 mm.
Achene cylindric to fusiform, 2.4–3.8 mm, smooth, densely pa-
pillose. Pappus dirty white; outer bristles 1–4 mm; inner bristles
8–11 mm. Fl. and fr. Aug–Sep. 2n = 36.

Alpine rock crevices, scree slopes; ca. [4400–]5300 m. S Xizang
(Tingri) [E Nepal].

The only record of Saussurea bhutakesh from China is a picture
from Langma La in Tingri Xian (Fujikawa & Springate, Newslett.
Himalayan Bot. 39: 38. 2007). This treatment is based on the original
description and on the revision by Fujikawa (Makinoa, n.s., 8: 53–55.
2010).


雪莲亚属 xue lian ya shu


Herbs, perennial or rarely biennial, polycarpic or rarely monocarpic, cauliforous, rarely substemless or stemless. Stems erect or
ascending, simple or apically branched, leafy. Leaves elliptic, oblong, ovate, obovate, or linear, undivided, margin entire, denticulate,
or sinuate-dentate. Uppermost stem leaves and bracts boat-shaped and keeled or flat, membranous or papery, enclosing, half-
enclosing, or subtending and surrounding synflorescence or capitulum, colored pale yellow, yellowish green tinged purple, purple, or
red. Capitula 1 to many, terminal on stem, solitary or in a lax or condensed corymbiform or hemispheric synflorescence. Phyllaries
without an appendage. Receptacle usually with many subulate bristles, rarely papilllose or naked. Corolla glabrous. Anther tails
lacerate or sometimes simple. Achenes smooth or ribbed, sometimes wrinkled, glabrous, usually without an apical crown. Pappus
dirty white, yellowish, straw-colored, or light brown, always in 2 rows; outer bristles scabrid.

Twenty-eight species: Bhutan, China, N India, Kashmir, Kazakhstan, Kyrgyzstan, Mongolia, N Myanmar, Nepal, Pakistan, Russia (Siberia); 25
species (18 endemic) in China.

1a. Uppermost leaves and bracts pale yellow, membranous, usually more than 3 cm wide.

2a. Capitula (1 or)2–5, in a laxly paniculiform synflorescence or rarely solitary, nodding, with a long
(to 7 cm) peduncle; uppermost stem leaves not aggregated but distant from each other .............. 41. S. wettsteiniana

2b. Capitula numerous (5–30), in a condensed corymbiform or hemispheric synflorescence, erect, sessile
or with a short (to 3 cm) peduncle; uppermost stem leaves aggregated below synflorescence.

3a. Uppermost stem leaves connivent and enclosing synflorescence; synflorescence laxly corymbiform;
stem 0.4–1.4 cm in diam. .............................................................................................................................. 44. S. obvallata

3b. Uppermost stem leaves stellately spreading; synflorescence strongly condensed corymbiform
hemispheric; stem 1.5–3 cm in diam.

4a. Stem base covered with band-shaped remains of leaf sheaths; outer phyllaries linear-subulate,
1.1–1.8 cm, densely sericeous ................................................................................................................ 42. S. orgaadayi

4b. Stem base densely covered with fibrous remains of leaf sheaths; outer phyllaries narrowly
triangular-ovate, 0.8–1.1 cm, glabrescent ............................................................................................ 43. S. involucrata

1b. Uppermost leaves and bracts yellowish or greenish tinged with purple, yellowish rose, or purple,
membranous or papery, usually less than 3 cm wide.

5a. Capitula (1 or)2–9(–13), in a corymbiform synflorescence or rarely solitary.

6a. Leaves abaxially grayish white and sericeous-tomentose, adaxially green .................................. 34. S. phaeantha

6b. Leaves concolorous, green, glabrescent.

7a. Phyllaries obtuse or rounded at apex.

8a. Uppermost stem leaves large, 1–2.5 cm wide, half-enclosing synflorescence; capitula
usually 3–6 .................................................................................................................................................. 54. S. iodosgia

8b. Uppermost stem leaves small, 0.2–1 cm wide, not enclosing synflorescence; capitula 1–3 ...... 53. S. nigrescens

7b. Phyllaries acute or acuminate at apex.

9a. Colored uppermost stem leaves not aggregated below synflorescence, distant from each other,
not covering capitula.

10a. Involucre obconic, 1–2 cm in diam.; phyllaries glabrescent; leaves green, abaxially ±
densely glandular ............................................................................................................................... 50. S. erubescent

10b. Involucre broadly obconic, 2–2.5 cm in diam.; phyllaries densely villous; leaves
blackening when dry, subglabrous, without glands .................................................................. 51. S. taipaiensis

9b. Colored uppermost stem leaves aggregated below synflorescence, surrounding and covering
at least basal part of capitula.

11a. Leaves smooth, sparsely villous and without glands ............................................................ 55. S. veitchiana

11b. Leaves scabrid, glabrescent and usually with sessile or stalked glands.

12a. Leaf margin subentire to minutely denticulate .............................................................................. 52. S. gymnocephala

12b. Leaf margin sinuate-dentate.
13a. Capitula in a clustered synflorescence, sessile or subsessile; plants usually less than 20 cm tall; leaves usually less than 7 cm ............................................... 45. *S. tangutica*

13b. Capitula in a corymbiform synflorescence, pedunculate; plants usually more than 20 cm tall; leaves usually more than 10 cm.

14a. Plants tufted and forming large clumps; stems many; achene distinctly ribbed, apex with a dentate crown ................................................................. 48. *S. luae*

14b. Plants not tufted; stems solitary or few; achene smooth or indistinctly ribbed, apex without a dentate crown.

15a. Uppermost stem leaves yellowish tinged with purple, margin irregularly dentate; involucre obconic to broadly campanulate .......... 47. *S. schultzii*

15b. Uppermost stem leaves intensely red to purple, margin subentire; involucre globose ................................................................. 49. *S. globosa*

5b. Capitulum 1(or 2).

16a. Colored uppermost stem leaves not aggregated below capitulum, distant from each other, not covering capitulum.

17a. Phyllaries obtuse at apex ................................................................................................. 53. *S. nigrescens*

17b. Phyllaries acute or acuminate at apex.

18a. Leaves abaxially grayish white and densely tomentose, adaxially green ................................. 33. *S. pubifolia*

18b. Leaves green and ± concolorous.

19a. Leaf blade glabrescent, sometimes glandular, margin sinuate-dentate.

20a. Involucre obconic, 1.5–2 cm in diam.; phyllaries glabrescent; leaves green, abaxially ± densely glandular ................................................................. 50. *S. erubescens*

20b. Involucre broadly obconic, 2–2.5 cm in diam.; phyllaries densely villous; leaves blackening when dry, subglabrous and without glands ........................................ 51. *S. taipaiensis*

19b. Leaf blade pubescent or sericeous, without glands, margin subentire or denticulate.

21a. Involucre 3–3.5 cm in diam.; outer phyllaries 1.5–2.3 cm; upper stem leaves to 2.5 cm wide; leaf blade sericeous, base attenuate and gradually tapering into winged petiole, apex acute to acuminate ................................................................. 39. *S. longifolia*

21b. Involucre 1–2.5 cm in diam.; outer phyllaries 1–1.5 cm; upper stem leaves to ca. 1.5 cm wide; leaf blade pilose or glabrescent, base asymmetric and rounded, cordate, or cuneate, abruptly narrowed into petiole, apex obtuse to subacute ........................................ 40. *S. polycolea*

16b. Colored uppermost stem leaves aggregated below capitulum, surrounding and covering at least basal half of involucre.

22a. Leaves linear, 1–5 mm wide.

23a. Leaves grayish green, concolorous, both surfaces ± densely villous; caudex with hard tunic of pale brown persistent remains of petioles .................................................. 31. *S. pilinophylla*

23b. Leaves adaxially dark green and glabrous; caudex with blackish brown withered remains of petioles ................................................................. 32. *S. hookeri*

22b. Leaves narrowly elliptic, narrowly ovate, or linear, more than 6 mm wide.

24a. Leaves on both surfaces grayish green and lanate-tomentose ........................................... 35. *S. velutina*

24b. Leaves adaxially green and not lanate-tomentose.

25a. Leaves adaxially green, abaxially grayish white.

26a. Leaf margin sinuate-dentate; uppermost stem leaves few, purplish red, enclosing capitulum ................................................................. 33. *S. pubifolia*

26b. Leaf margin entire; uppermost stem leaves many, pale yellow, stellately spreading and subtending capitulum ........................................ 36. *S. baoxingensis*

25b. Leaves green, ± concolorous.

27a. Leaves abaxially with sessile glands, margin subentire to minutely denticulate ................................................................. 52. *S. gymnocephala*

27b. Leaves with stalked glandular hairs or without glands, margin sinuate-dentate.

28a. Leaves smooth, pilose, or sericeous ................................................................................. 37. *S. muliensis*

28b. Leaves scabrid, glabrescent.

29a. Leaves usually more than 2 cm wide, apex usually obtuse .............. 38. *S. uniflora*

29b. Leaves usually less than 2 cm wide, apex acute.

30a. Involucre broadly campanulate; phyllaries densely villous, subequal, 1–1.6 cm; corolla 1–1.5 cm .................................................. 45. *S. tangutica*

30b. Involucre obconic; phyllaries pilose, glabrescent, unequal, 0.6–2.2 cm; corolla 1.5–1.8 cm ................................................................. 46. *S. bracteata*

膜鞘风毛菊 mo qiao feng mao ju

*Saussurea tunicata* Handel-Mazzetti.

Herbs (2–)7–23 cm tall, perennial, caespitose, forming large clumps. Caudex stout, many branched near ground level, densely covered by hard tunic of pale brown persistent remains of petioles. Stems numerous, 2–4 mm in diam., erect, simple. Rosette and lower stem leaves shortly petiolate; leaf blade narrowly ovate-elliptic to linear, (1.5–)4–7 × 0.2–0.6 cm, both surfaces grayish green and densely villous to sericeous, margin revolute and subentire or mucronulate, apex acute. Middle and upper stem leaves sessile, both surfaces grayish green to purplish red. Uppermost stem leaves ± aggregated, narrowly ovate, purplish red, 1.1–1.6 cm, tube 4.5–7.5 mm, limb 5.5–6.5 mm, lobe 3.5–4.5 mm. Achene cylindric, 3.5–4 mm, glabrous. Pappus straw-colored; outer bristles 2–3 mm; inner bristles 0.9–1.1 cm. Fl. and fr. Jul–Aug.

- Alpine scree slopes and grasslands; 4000–5300 m. Qinghai, NW Sichuan, Xizang.

Examination of rediscovered type material of *Saussurea piloniphyllea* at WRSL and WU has shown that these plants from NW Sichuan are identical with those of *S. tunicata* from Xizang and Qinghai. They only differ in taller growing stems. There is a pronounced tendency to smaller, almost stemless plants in higher and drier regions of the Qinghai-Xizang Plateau.

32. *Saussurea hookeri* C. B. Clarke, Compos. Ind. 230. 1876.

棚圆风毛菊 tuo yuan feng mao ju

*Saussurea hookeri* var. *hookeri* Handel-Mazzetti.

Herbs 4–30 cm tall, perennial. Caudex simple or few branched, covered with blackish brown withered remains of leaf bases. Stems usually solitary, 1.5–3.5 (–)5 mm in diam., erect, simple. Rosette and lower stem leaves narrowly linear, 4–18 × 0.1–0.6 cm, abaxially paler green and pilose on midvein, adaxially dark green and glabrous, base attenuate, margin revolute and entire or denticulate, apex obtuse. Middle and upper stem leaves sessile, linear-subulate to narrowly ovate, 2–10 × 0.3–1 cm, both surfaces sericeous, apex acuminate. Uppermost stem leaves triangular-ovate, ovate, or elliptic, 1.3–2 × 0.4–1.1 cm, both surfaces blackish purple and densely sericeous, apex acute. Capitulum solitary. Involucre campanulate, 2–3 cm in diam. Phyllaries in 4 or 5 rows, black, sericeous; outer phyllaries narrowly triangular-ovate, 7–13 × 3–4 mm, apex obtuse; middle and inner phyllaries 11–14 × 1–2 mm, apex obtuse to acute. Receptacle bristles (0.6–)4–7 mm. Corolla purple, 0.9–1.5 cm, tube 4.5–8 mm, limb 5.5–7 mm, lobes 3–5 mm. Achene straw-colored with black spots, cylindric, 3.5–5.5 mm, ribbed, apex with a short crown. Pappus dirty white; outer bristles 1–6 mm; inner bristles 0.9–1.2 cm. Fl. and fr. Aug–Sep.

Alpine grasslands; 4300–5300 m. Qinghai, W Sichuan, Xizang [Bhutan, NE and NW India, Kashmir, Nepal].


毛背雪莲 mao bei xue lian

Herbs 15–45 cm tall, perennial. Caudex stout, few branched, densely covered with persistent remains of petioles. Stems usually solitary, 2–5 mm in diam., erect, simple. Rosette, basal, and lower stem leaves petiolate; leaf blade narrowly elliptic to linear, 8–25 × 0.4–1.5 cm, abaxially grayish white, densely lanate, and sometimes gland-dotted, adaxially green and sparsely pilose, base attenuate, margin revolute and subentate, apex acute. Middle and upper stem leaves sessile, narrowly ovate to elliptic, 5–9 × 1–1.5 cm, base semiamplexical. Uppermost stem leaves ovate and boat-shaped, 2.5–5.5 × 1–2.6 cm, enclosing or subtending capitulum, both surfaces purplish red, base rounded, margin dentate, apex acute. Capitulum solitary. Involucre broadly campanulate, 2–2.5 (–)3 cm in diam. Phyllaries in ca. 4 rows, blackish brown, densely villous, apex acuminate; outer phyllaries narrowly triangular-ovate, 7.5–8.5 × 2.5 mm; middle phyllaries narrowly ovate, 9–12 × 2–2.5 mm; inner phyllaries linear, 15–16 × 0.8–1.7 mm. Corolla purple, 1.2–1.6 cm, tube 7–8 mm, limb 7–8 mm, lobes 4.8–5.4 mm. Achene black, obconic, 4.4–5.8 mm. Pappus straw-colored; outer bristles 1.2–2.4 mm; inner bristles 1–1.2 cm. Fl. and fr. Jul–Aug.

- Alpine scree slopes, grasslands; 4500–5200 m. SC Xizang.

1a. Uppermost stem leaves large, membranous, surrounding capitulum; leaves abaxially with golden glands ............................................. 33a. var. *pubifolia*

1b. Uppermost stem leaves small, herbaceous, not surrounding capitulum; leaves abaxially without golden glands ........ 33b. var. *lhasaensis*

33a. *Saussurea pubifolia* var. *pubifolia*

毛背雪莲(原变种) mao bei xue lian (yuan bian zhong)

Leaves with golden glands. Uppermost stem leaves large, membranous, surrounding capitulum.

- Alpine scree slopes; 4500–5100 m. SC Xizang.


小毛雪莲 xiao bao xue lian

Leaves without golden glands. Uppermost stem leaves small, herbaceous, not surrounding capitulum.

- Alpine grasslands; 4600–5200 m. SC Xizang (Lhasa).


褐花雪莲 he hua xue lian

*Saussurea tsarongensis* J. Anthony.
Herbs 4–40 cm tall, perennial, caespitose. Caudex simple or few branched. Stems solitary or 2–4, 3–6 mm in diam., erect, simple. Rosette and basal stem leaves petiolate; leaf blade narrowly elliptic to linear, 3–15 × 0.5–1.6 cm, abaxially pale green and densely sericeous-villous, adaxially dark green and pilose but glabrescent, margin undulate or sinuate-dentate, apex acuminate. Middle and upper stem leaves sessile, 2–7.5 × 0.3–1.2 cm, base semiamplexicaul. Uppermost stem leaves narrowly elliptic or triangular-ovate, 1–2.5 × 0.2–0.6 cm, membranous, half-enclosing synflorescence, both surfaces purple, margin entire or with a few teeth. Capitula 3–10–15, in a congested corymbiform synflorescence 2.5–5 cm in diam., shortly pedunculate or sessile. Involucre cylindric, 0.7–1.5 cm in diam. Phyllaries in 3 or 4 rows, blackish purple, densely villous; outer phyllaries triangular-ovate, (5.5–)7.5–12 × 2–4.5 mm, apex acute; middle and inner phyllaries narrowly ovate, 8–11 × 0.9–2.8 mm, apex obtuse. Receptacle bristles 3–4 mm. Corolla dark brownish purple, 0.8–1.2 cm, tube 3.3–5 mm, limb 4.6–6 mm, lobes 2.4–3 mm. Achene straw-colored, cylindric to obovoid, 3–5 × 1–1.2 cm, base semiamplexicaul. Phyllaries in 3 or 4 rows, blackish purple, densely pilose, margin entire or with a few teeth. Capitula 3–10–15, in a congested corymbiform synflorescence 2.5–5 cm in diam., shortly pedunculate or sessile. Involucre cylindric, 0.7–1.5 cm in diam. Phyllaries in 3 or 4 rows, blackish purple, densely villous; outer phyllaries triangular-ovate, (5.5–)7.5–12 × 2–4.5 mm, apex acute; middle and inner phyllaries narrowly ovate, 8–11 × 0.9–2.8 mm, apex obtuse. Receptacle bristles 3–4 mm. Corolla dark brownish purple, 0.8–1.2 cm, tube 3.3–5 mm, limb 4.6–6 mm, lobes 2.4–3 mm. Achene straw-colored, cylindric to obconic, 3.3–4.8 mm, obtusely 5-ribbed. Pappus dirty white to pale brown; outer bristles 0.4–2.8 mm; inner bristles 8–10 mm. Fl. and fr. Jun–Sep.

- Alpine meadows, grasslands, mountain steppes; (2300–)3000–4800 m. Gansu, Qinghai, W Sichuan, SE Xizang (Zayü), NW Yunnan (Dégèn).

35. Saussurea velutina


毡毛雪莲 zhan mao xue lian

Herbs 17–40 cm tall, perennial, caespitose. Caudex stout, many branched, covered with persistent remains of petioles. Stems many, 5–8 mm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade narrowly elliptic to linear, 5.5–17 × 0.7–2 cm, both surfaces grayish green and densely lanatetomentose, margin shallowly sinuate-dentate to subentire, apex acute. Middle and upper stem leaves sessile, narrowly ovate to narrowly elliptic, 6.5–12.5 × 1–2 cm. Uppermost stem leaves ovate or narrowly ovate and boat-shaped, (1–)3–6 × (0.8–)1.5–3 cm, membranous, enclosing involucre, both surfaces purplish red and sparsely villous, margin denticulate or entire. Capitulum solitary. Involucre broadly campanulate, 3–4 cm in diam. Phyllaries in 4 or 5 rows, black or blackish purple, yellowish white villous, apex acuminate and often reflexed; outer phyllaries narrowly triangular-ovate, 11–14 × 3–5 mm; middle phyllaries narrowly triangular-ovate, 14–15 × 2–3 mm; inner phyllaries narrowly ovate to linear, 15–19 × 1–2.5 mm. Receptacle bristles 1.5–5.8 mm. Corolla purple, 1.2–1.5 cm, tube 6.5–8 mm, limb 6–7.5 mm, lobes 3.2–4.8 mm. Achene obovoid to cylindric, 3.5–5.5 mm. Pappus dirty white; outer bristles 2–6 mm; inner bristles 1–1.2 cm. Fl. and fr. Jul–Sep.

- Alpine scree slopes, mats, and pastures; (3300–)4100–5500 m. SW Sichuan, SE Xizang, NW Yunnan.

36. Saussurea baoxingensis


宝兴雪莲 bao xing xue lian

Herbs 20–40 cm tall, perennial. Caudex stout, woody, much branched. Stem solitary, 4–5 mm in diam. near base, erect, simple. Lower stem leaves sessile, linear, 6–25 × 0.6–0.9 cm, abaxially light green and densely lanate, adaxially green and sparsely villous, margin entire, apex acute. Upper stem leaves narrowly triangular-ovate, 5–12 × 1.2–1.5 cm. Uppermost stem leaves 12–14, sessile, ovate, 4.3–5 × 1.2–2.5 cm, membranous, aggregated and stellately spreading below capitulum, both surfaces yellowish white, abaxially sparsely villous, adaxially glabrous, margin entire and ciliate, apex acute. Capitulum solitary. Involucre broadly campanulate, ca. 2 cm in diam. Receptacle bristles 3–4 mm. Phyllaries in ca. 4 rows, yellowish to purplish black but with a dark brown margin, apically densely villous, margin minutely denticulate, apex acute; outer phyllaries narrowly ovate-elliptic, 11–13 × 2–2.5 mm; middle phyllaries narrowly ovate-elliptic, 10–12 × 1.5–2 mm; inner phyllaries narrowly elliptic, 9–10 × 1–1.1 mm. Corolla purple, 9–10 mm, tube 3–4 mm, limb 4.5–6 mm, lobes 1.3–1.5 mm. Achenes only seen when immature. Pappus dirty yellowish white; outer bristles 2.5–3 mm; inner bristles 7–8 mm. Fl. and fr. Aug–Sep.

- Open rock crevices; ca. 4000 m. Sichuan (Baoxing).

Saussurea baoxingensis is a very distinct taxon only known from the type collection and has not been observed in the field since 1936.

37. Saussurea muliensis


木里雪莲 mu li xue lian

Herbs 20–30 cm tall, perennial. Caudex stout, few branched, covered with blackish remains of petioles. Stems usually solitary, 3–5 mm in diam., erect, simple. Rosette and lower stem leaves sessile or shortly petiolate; leaf blade narrowly elliptic to obovate, 10–16 × 1–2.4 cm, both surfaces green and sparsely pilose to densely villous, base attenuate, margin denticulate to subentire, apex acute. Middle and upper stem leaves sessile, narrowly ovate to ovate-elliptic, 6.5–10 × 2–3.4 cm, both surfaces green to purple, base semiamplexicaul. Uppermost stem leaves ovate and boat-shaped, 4–6.5 × 2.4–4.8 cm, half-enclosing involucrre, both surfaces purplish red. Capitulum solitary. Involucre broadly campanulate, 2.5–4.5 cm in diam. Phyllaries in 3–5 rows, blackish brown, villous, apex acute; outer phyllaries triangular-ovate, 8–10 × 3–3.5 mm; middle phyllaries narrowly elliptic to ovate, 11–14 × 3–3.5 mm; inner phyllaries linear, 1.6–2 × 0.2–0.3 cm. Corolla purple, 1.4–1.7 cm, tube 6–9 mm, limb 7.5–8 mm, lobes 4.6–5.7 mm. Achene (immature) cylindric, ca. 5 mm. Pappus dirty white; outer bristles 3–6.5 mm; inner bristles 1.7–1.8 cm. Fl. and fr. Aug–Sep.

- Grasslands on mountain slopes; 4300–4400 m. SW Sichuan (Muli).

38. Saussurea uniflora


单花雪莲 dan hua xue lian

Aplotaxis uniflora Candolle, Prodr. 6: 539. 1838; Saussurea conica C. B. Clarke; S. uniflora var. conica (C. B. Clarke) Lipschitz; S. uniflora var. sinensis J. Anthony.
Herbs 14–70 cm tall, perennial. Caudex stout, simple or few branched. Stems usually solitary, 3–7 mm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade oblanceolate, elliptic, narrowly elliptic, or obovate, (3–)12–32 × (1–)2–6.5 cm, both surfaces green and glabrescent, margin sinuate-dentate, apex obtuse to acute. Middle and upper stem leaves sessile, elliptic to elliptic-ovate, 7–19 × 2–4.5(–7.5) cm, both surfaces green tinged with purple, base cuneate or auriculate-amplexical, apex acutate to obtuse. Uppermost stem leaves sessile, elliptic, boat-shaped, 1.5–4.5 × 0.6–1.8 cm, membranous, half-enclosing capitula, both surfaces purplish red, abaxially villous and sometimes glandular hairy, adaxially glabrescent, margin entire, apex acute to acuminata. Capitulum solitary [or several in a corymbiform synflorescence]. Involucre obconic, 2.5–4 cm in diam. Phyllaries in ca. 4 rows, apically villous, apex acuminata; outer phyllaries ovate-triangular, 10–15 × 2.5–5 mm; middle and inner phyllaries narrowly ovate to linear, 1.6–2 × 0.1–0.3 cm. Receptacle bristles 5–7.5 mm. Corolla bluish purple, 1.2–1.8 cm, tube 6–9 mm, limb 6.5–8 mm, lobes 3.6–5.7 mm. Achene blackish brown, cylindric, 4.5–6 mm, indistinctly ribbed. Pappus yellowish white; outer bristles 3–8.5 mm; inner bristles 1–1.3 cm. Fl. and fr. Jul–Sep. 2n = 32.

Forests, thickets, alpine meadows; 3600–4800 m. S Xizang, NW Yunnan [Bhutan, NE India, Nepal].

Saussurea uniflora is a very variable species. Plants with several capitula have been described as S. conica from N India, but there is no reason to keep them separate from S. uniflora at any taxonomic rank. However, the name S. conica has been misapplied in a number of Chinese floras for a different taxon, the recently described S. luae (see discussion under that species).


长叶雪莲 chang ye xue lian

Herbs 25–40 cm tall, perennial. Caudex simple or few branched. Stem solitary, 4–6 mm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade narrowly elliptic to linear, 10–35 × 1–5 cm, both surfaces green, abaxially densely sericeous, adaxially sparsely villous, margin subentire to denticulate, apex acute. Middle and upper stem leaves sessile, narrowly elliptic to ovate or obovate to linear and boat-shaped, 5–16 × 1.5–4 cm, both surfaces green to dark purple, base semiamplexicaul, margin entire, apex acutate to acuminate. Capitulum solitary. Involucre obconic to broadly campanulate, 3–3.5(–4.5) cm in diam. Phyllaries in 3 or 4 rows, blackish brown or purple, sericeous, apex acuminata; outer phyllaries narrowly triangular-ovate, 1.5–2.3 × 0.3–0.5 cm; middle phyllaries linear-subulate, 2.2–2.3 × 0.3–0.4 cm; inner phyllaries linear, 2.1–2.3 × 0.2–0.3 cm. Receptacle bristles 4–9 mm. Corolla dark purple, 1.8–2.1 cm, tube 6–9 mm, limb 7–9 mm, lobes 4.5–5.8 mm. Achene achene blackish brown, cylindric, 4.5–6 mm, indistinctly 5-ribbed. Pappus pale brown; outer bristles 1–5.5 mm; inner bristles (0.8–)1–1.2 cm. Fl. and fr. Jul–Oct.

● Grasslands on mountain slopes, scree slopes, thickets, rocky pastures; 3200–4700 m. W Sichuan, E Xizang, NW Yunnan.

Saussurea nidularis, only known from the type collection, was described from juvenile specimens with capitula in bud stage. It does not differ from S. polycolea in any developed character; its substemless growth form is most probably due to its early developmental stage.

Saussurea polycolea var. acutisquama is a synonym of S. erubescens. The name of the variety was often misapplied for a recently recognized good species, S. acutisquama of S subg. Saussurea.


多鞘雪莲 duo qiao xue lian

Saussurea polycolea Handel-Mazzetti.

Herbs (3–)6–45 cm tall, perennial. Caudex simple or few branched. Stems solitary or several, 1–4 mm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade narrowly ovate, elliptic, or obovate, 2–20 × 0.5–3 cm, both surfaces green and pubescent, base usually asymmetric and cuneate, rounded, or cordate, margin subentire to shallowly sinuate-denticulate, apex obtuse to acute and mucronate. Middle and upper stem leaves sessile, ovate or obovate and boat-shaped, 3–13 × 0.8–3.2 cm, both surfaces green to purple, base amplexicaul, margin entire, apex acuminata. Uppermost stem leaves boat-shaped, 1.5–6.5 × 0.3–1.6 cm, both surfaces purplish red. Capitulum solitary. Involucre obconic to campanulate, 1–2.5 cm in diam. Phyllaries in 4 or 5 rows, blackish brown or purple, sericeous-villous, apex acutate to acuminate; outer phyllaries narrowly triangular-ovate, 10–15 × 2–5 mm; middle phyllaries narrowly elliptic, 12–16 × 2–3 cm; inner phyllaries linear, 12–18 × 1–2 mm. Receptacle bristles 2.5–6(–9) mm. Corolla purple, 1.5–1.7 cm, tube 7–9 mm, limb 6–9 mm, lobes 4.5–5.8 mm. Achene achene blackish brown, obovoid, 3.8–4.6 mm, indistinctly 5-ribbed. Pappus pale brown; outer bristles 1–5.5 mm; inner bristles (0.8–)1–1.2 cm. Fl. and fr. Jul–Oct.

● Grasslands, thickets, alpine meadows; 3600–4700 m. S Xizang, NW Yunnan.

We cannot confirm the record of Saussurea longifolia from Qinghai reported by S. W. Liu (Fl. Qinghai. 3: 450. 1996).
tube 6–9.5 mm, limb 6–9.5 mm, lobes 2.5–5.5 mm. Achene straw-colored with blackish spots, obovoid, 5.4–6.7 mm, indistinctly ribbed. Pappus light yellowish brown; outer bristles 1–5.4 mm; inner bristles 1.1–1.4 cm. Fl. and fr. Jul–Sep.

- Forest margins, grasslands, meadows near mountain rivers; 3200–4300 m. W Sichuan, NW Yunnan.

Records of Saussurea weitteiiana from Xizang are due to misidentifications (see discussion under S. laeve).


Herbs 40–65 cm tall, perennial or biennial. Stem solitary, 2.5–3 cm in diam., erect, simple, hollow, densely leafy, covered at base with hand-shaped remains of petioles. Rosette and lower stem leaves petiolate; leaf blade elliptic to narrowly elliptic-obovate, 6–16 × 3–4 cm, both surfaces green, scabrous, glandular hairy, and sparsely pilose, margin sinuate-dentate to serrate, apex acute. Middle and upper stem leaves sessile, narrowly ovate, elliptic, or obovate, 8–17 × 2.5–5.5 cm, base auriculate. Uppermost stem leaves ovate to narrowly triangular-ovate, 4–12 × 1.5–6.5 mm, membranous, stellately surrounding synflorescence, both surfaces yellowish, margin dentate. Capitula 20–30, in a hemispheric synflorescence 12–15 cm in diam., sessile or shortly pedunculate. Involutre campanulate, 2–3 cm in diam. Phyllaries in 3–5 rows, linear-subulate, brown with dark margin, sericeous-villous, apex acuminate; outer phyllaries 11–18(–23) × 1.2–2.5 mm; middle and inner phyllaries 14–18 × 1.4–1.8 mm. Receptacle naked or shortly papillose. Corolla purple, 1.7–1.9 cm, tube 8.5–9.5 mm, limb 8.5–9 mm, lobes 4.2–4.6 mm. Achene straw-colored with blackish spots, cylindric, 5–6.7 mm, obusely 5-ribbed. Pappus straw-colored; outer bristles 1–4 mm; inner bristles 1.1–1.4 cm. Fl. Jul–Aug, fr. Aug–Oct. 2n = 32.

N Xinjiang (Altay Shan) [Mongolia, Russia (Siberia)].

The whole plant of Saussurea orgaadayi is used medicinally and the species is endangered in China due to over-collecting.

Most previous records from the Chinese Altay probably belong to Saussurea orgaadayi, but the occurrence of S. involucrata cannot be excluded there.

44. Saussurea obvallata (Candolle) Schultz Bipontinus, Linnaea 19: 331. 1846.

苞叶雪莲 bao ye xue lian

Aplotaxis obvallata Candolle, Prodr. 6: 541. 1838; Saussurea obvallata var. orientalis Diels.

Herbs 15–80 cm tall, perennial. Caudex stout, usually unbranched. Stem solitary, 4–14 mm in diam., erect, simple. Basal and lower stem leaves petiolate; leaf blade ovate, elliptic-oblong, or obovate, 7–32 × 1–6.5 cm, both surfaces pilose and glandular hairy but glabrescent, base attenuate, margin subentire to sinuate-dentate, apex obtuse to acute. Middle and upper stem leaves sessile, narrowly elliptic to ovate, 5–16 × 1.5–8 cm, base semiamplexicaul. Uppermost stem leaves elliptic or ovate, boat-shaped, 5–15 × 1.5–9 mm, membranous, enclosing synflorescence and forming a lanternlike head of 4–14 cm in diam., both surfaces pale yellow. Capitula 2–16, in a corymbiform synflorescence 3.5–9 cm in diam., pedunculate or subsessile. Involucre globose to campanulate, 1–3 cm in diam. Phyllaries in 3–5 rows, straw-colored with dark margin and apex, pilose to glabrescent, apex acute to acuminate; outer phyllaries triangular-ovate, 5–15 × 2–6 mm; middle phyllaries narrowly ovate, 7–15 × 1–4 mm; inner phyllaries linear, 8–14 × 1–2 mm. Receptacle bristles 1–5 mm. Corolla purple, 0.9–1.3 cm, tube 4–7 mm, limb 4.5–6 mm, lobes 1.8–3.3 mm. Achene straw-colored with dark spots, cylindric, 2–5 mm, 4–7-ribbed. Pappus dirty white-yellowish; outer bristles 2–5 mm; inner bristles 7.5–11 mm. Fl. and fr. Jul–Sep. 2n = 32*.

Grasslands, rocky places on mountain slopes, by streams, scree slopes; 3200–5200 m. E Qinghai, W Sichuan, SE Xizang, NW Yunnan [Bhutan, NE and NW India, Kashmir, N Myanmar, Nepal].

The whole plant of Saussurea obvallata is used medicinally.

The combination Saussurea obvallata by Schultz Bipontinus preceded the same name by Edgeworth (Trans. Linn. Soc. London 20: 76. Aug 1846) by one month.

The combination Saussurea obvallata by Schultz Bipontinus preceded the same name by Edgeworth (Trans. Linn. Soc. London 20: 76. Aug 1846) by one month.

唐古特雪莲  tāng gu te xuè lián  

*Saussurea tangutica* var. *bayankaraensis* W. Y. Wang.  

Herbs 6–20(–30) cm tall, perennial, caespitose. Caudex simple or branched. Stems solitary or several, 2.5–4 mm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade narrowly elliptic, 3–9 × 0.7–2.3 cm, both surfaces green, abaxially pilose, adaxially scabrous but glabrescent, margin sinuate-dentate, apex acute and mucronate. Middle stem leaves sessile, 3.3–5 × 0.6–1.2 cm. Uppermost stem leaves ovate and boat-shaped, 3–4.5 × 1.5–2.5 cm, membranous, enclosing synflorescence and forming a lanternlike head of 3.5–7 cm in diam., both surfaces yellowish rose to purple, margin dentate, apex acuminated. Capitula 1–5, solitary or in a condensed corymbiform synflorescence 3–7 cm in diam., subsessile. Involucrre campanulate, 1–3 cm in diam. Phyllaries in ca. 4 rows, blackish purple, densely villous, apex acuminated; outer phyllaries elliptic, (5–)10–13 × 2.5 mm; middle phyllaries narrowly elliptic, 11–15 × 2.3 mm; inner phyllaries linear, 13–16 × 1–2 mm. Receptacle bristles 0.5–2 mm. Corolla purple, (1–)1.4–1.5 cm, tube (5–)6.5–8 mm, limb (5–)7–7.5 mm, lobes (2.8–)4.2–4.8 mm. Achene straw-colored, sometimes tinged purple and with blackish spots, cylindrical, 4.5–5.5 mm. Pappus dirty white; outer bristles 2–4 mm; inner bristles 0.9–1.1 cm. Fl. and fr. Jul–Sep.

- Alpine scree slopes, alpine meadows; 3600–5300 m. Gansu, Qinghai, NW Sichuan, Xizang.


膜苞雪莲  mò bāo xuè lián  

*Saussurea bracteata* (Pamp.) Pampanini; *S. schultzii* J. D. Hooker var. *nana* Pampanini.  

Herbs 3–8(–20) cm tall, perennial, sometimes stemless. Caudex simple or few branched. Stems usually solitary, 2–3 mm in diam., erect, simple. Rosette and lower stem leaves shortly petiolate; leaf blade narrowly elliptic, 2–10 × 0.2–1 cm, abaxially glabrescent, adaxially glandular hairy, margin sinuate-dentate, apex acute. Middle and upper stem leaves sessile, narrowly ovate-elliptic, 3–5 × 0.5–1.8 cm. Uppermost stem leaves elliptic or ovate, 1.5–3.5 × 0.8–1.7 cm, membranous, half-enclosing capitulum, both surfaces yellowish green tinged purple to purplish red, margin dentate, apex acuminated. Capitulum solitary. Involucrre narrowly campanulate to obconic, (1–)1.5–2.5(–3.5) cm in diam. Phyllaries in ca. 4 rows, densely villous to sparsely pilose, apex acute; outer phyllaries triangular-ovate, 6–9(–14) × 3–4 mm; middle phyllaries narrowly ovate to linear, 13–18 × 2–3 mm; inner phyllaries linear, 1.5–2.2 × 0.1–0.2 mm. Receptacle bristles 1.5–2.5 mm. Corolla purplish red, 1.5–1.8 cm, tube 6.5–8.5 mm, limb 7.5–9.5 mm, lobes 4.4–6 mm. Achene straw-colored, cylindrical to obovoid, 5–6 mm, 4 or 5-ribbed. Pappus dirty white; outer bristles 2–3.6(–5) mm; inner bristles 1.1–1.5 cm. Fl. Jul–Sep, fr. Sep–Oct.

Alpine meadows and scree slopes; 4500–5400 m. S Xinjiang, W Xizang [NW India, Kashmir].


克什米尔雪莲  kè shì mǐ er xuè lián  

Herbs 16–42 cm tall, perennial. Caudex usually unbranched. Caudex stout, much branched. Stems many, 4–6 mm in diam., erect, simple. Basal and lower stem leaves petiolate; leaf blade narrowly elliptic, 7.5–23 × 1.2–3 cm, both surfaces green, scabrous, and densely glandular hairy, margin sinuate-dentate, apex acute. Middle and upper stem leaves sessile, 5.5–15 × 1–2.5 cm, base semiamplexicaul. Uppermost stem leaves sessile, elliptic or obovate and boat-shaped, 1.5–8 × 1–3.7 cm, membranous, half-enclosing synflorescence, both surfaces yellowish rose, margin dentate, apex acuminated. Capitula 3–8, in a condensed corymbiform synflorescence 3–10 cm in diam., pedunculate. Involucre obconic to campanulate, 1–2.5(–3) cm in diam. Phyllaries in 3–5 rows, straw-colored with dark margin and distal part, villous, apex acute to acuminated; outer phyllaries narrowly triangular, 9–12 × 1.5–3 mm; middle phyllaries narrowly elliptic to linear, 12–15 × 1–2.5 mm; inner phyllaries linear, 15–18 × 1–2 mm. Receptacle bristles (1–)3–4.5 mm. Corolla purple, 1.6–1.9 cm, tube 9–10 mm, limb 7.5–9 mm, lobes 4.2–5.2 mm. Achene brown, cylindrical to obovoid, 3.5–5 mm, obtusely 5–7-ribbed. Pappus dirty white; outer bristles 2.8–5 mm; inner bristles 1.2–1.4 cm. Fl. Jul–Aug, fr. Aug–Sep. 2n = 32 (as *Saussurea bracteata*).

Glacier moraines, rocky slopes, scree slopes; ca. 5200 m. SW Xinjiang (Yecheng) [NW India, Kashmir, Pakistan].

The only record of *Saussurea schultzii* in China is from the N declivity of the Karakorum range, where it was collected only twice in the first half of the 20th century.


宝璐雪莲  bāo lù xuè lián  

Herbs 30–70 cm tall, perennial, caespitose, forming large clumps. Caudex stout, much branched. Stems many, 4–6 mm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade narrowly elliptic, 10–35 × 0.6–3.2 cm, both surfaces green, abaxially gland-dotted, adaxially sparsely pilose to glabrescent, margin sinuate-dentate, apex acute. Middle and upper leaves sessile, narrowly elliptic to narrowly ovate, 7.5–14 × 1.4–2.8 cm. Uppermost stem leaves sessile, ovate, boat-shaped, 1.7–8 × 0.7–3.2 cm, half-enclosing synflorescence, both surfaces pale greenish yellow ± tinged purple, margin dentate, apex acuminated. Capitula (1 or)2–8, in a corymbiform synflorescence or rarely solitary, pedunculate. Involucre campanulate, 1.5–2.5 cm in diam. Phyllaries in 5 or 6 rows, blackish or purplish brown, villous, glabrescent, apex acute; outer phyllaries triangular-ovate, 7–8 × 2–3.5 mm; middle phyllaries narrowly ovate, 8–13 × 1.5–2.5 mm; inner phyllaries narrowly elliptic to linear, 13–15 × 1–2 mm. Receptacle bristles 3.5–7.5 mm. Corolla purple, 1.1–1.7 cm, tube 5.5–9 mm, limb 5–8 mm, lobes 3.2–4.4 mm. Achene blackish brown, cylindrical to obconic, 4–5.7 mm, 5–7-ribbed, apex with a denticulate crown. Pappus rose-purple; outer bristles 1.5–3.5 mm; inner bristles 1.4–1.6 cm. Fl. Aug–Sep, fr. Sep–Oct. 2n = 32*.

- Open gravelly and rocky slopes, stabilized boulder scree slopes, ravine beds; 4000–5000 m. NW Sichuan, E Xizang.
This taxon has been confused with *Saussurea conica* (here treated as a synonym of *S. uniflora*) and with *S. wettsteiniana*. All literature records of *S. conica* and *S. wettsteiniana* from Xizang (Y. L. Chen, Fl. Xizang. 4: 869. 1985; C. Shih & S. Y. Jun, FRPS 78(2): 29–30. 1999) belong in fact to *S. lutea*.


球花雪莲 qiú huā xuě lián

Herbs 10–70 cm tall, perennial. Caudex simple or few branched. Stems usually solitary, 2–7 mm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade narrowly ovoid, elliptic, or linear, 12–28 × 1–4.2 cm, both surfaces green, abaxially glandular hairy, adaxially glabrescent, margin dentate, apex acute. Middle and upper stem leaves sessile, 5–16 × 1.8–3.2 cm, both surfaces green to purple. Uppermost stem leaves ovate and boat-shaped, 4–6 × 1–2 cm, membranous, half-enclosing synflorescence, both surfaces red to purple, margin entire or serrulate, apex acuminate. *Capitula* (1 or)2–9(–13), in a corymbose synflorescence or rarely solitary, pedunculate. *Involucre* obconic, 1.5–2 cm in diam. Phyllaries in 3 or 4 rows, blackish purple or yellowish with dark margin, villous to glabrescent, apex acuminate; outer phyllaries triangular-ovate, 7.5–10 × 3–4.5 mm; middle phyllaries narrowly triangular-ovate, 9–11 × 2–3 mm; inner phyllaries linear, 12–14 × 1.5–2 mm. Receptacle bristles 3–5(–7.5) mm. *Corolla* purple, 1.3–1.5 cm, tube 7–8.5 mm, limb 6–7 mm, lobes 3.6–4.5 mm. Achene straw-colored to black, cylindric to obovoid, 3–5 mm, indistinctly ribbed. *Pappus* yellowish; outer bristles 8.5–10 mm; inner bristles 0.9–1.1 cm. *Fl. Jul–Aug, fr. Aug–Oct.*

- Alpine grasslands, thickets, meadows; 3000–4800 m. W Sichuan, NW Yunnan.


红柄雪莲 hóng bǐng xuě lián


Herbs 10–30 cm tall, perennial. Caudex simple or few branched. Stems solitary or 2, 1–3 mm in diam., erect, simple. Basal and lower stem leaves petiolate; leaf blade narrowly elliptic, 1.5–10 × 0.7–2(–3.5) cm, both surfaces green, abaxially densely glandular hairy, adaxially glandular hairy but glabrescent, margin sinuate-denticulate, apex acute to acuminate. Middle and upper stem leaves sessile, 2.5–4 × 0.4–0.9 cm, both surfaces green to purple, margin sinuate-denticulate or entire. Uppermost stem leaves sessile, elliptic and boat-shaped, 1.5–3.5 × 0.3–1 cm, both surfaces purple, margin entire, apex acuminate. *Capitula* (1 or)2 or 3(–5), in a corymbose synflorescence or rarely solitary, pedunculate. *Involucre* oblong, 1.5–2 cm in diam. Phyllaries in 4 or 5 rows, blackish purple, pilose, apex acute; outer phyllaries triangular-ovate, 8–10.5 × 2.5–5.5 mm; middle phyllaries narrowly triangular, 10–12 × 1.5–2.5 cm; inner phyllaries linear, 11–12 × 0.5–1.5 mm. Receptacle bristles 3–5.5 mm. *Corolla* purple, 1.1–1.7 cm, tube 5.5–7 mm, limb 6–9 mm, lobes 3.2–5 mm. Achene straw-colored with blackish spots, obovoid to cylindric, 3–4 mm, indistinctly ribbed. *Pappus* dirty white; outer bristles 1.4–5 mm; inner bristles 8.5–10 mm. *Fl. Jul–Aug, fr. Aug–Oct.*

- Alpine grasslands and meadows; 2400–4900 m. Gansu, Qinghai, NW Sichuan, Xizang.

The type of *Saussurea nigrescens* var. *acutisquama* clearly belongs to this taxon. Unfortunately, the combination of this epithet with *S. polycolea* by Lipschitz (who had no opportunity to check the type) was widely misapplied for an entirely different taxon, *S. acutisquama*, which was recently recognized as a good species.


太白山雪莲 tài bái shān xuě lián

Herbs 10–22 cm tall, perennial, caespitose. Caudex stout, branched. Stems solitary or few; 2–4 mm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade narrowly elliptic to oblong, 4–10(–20) × 1–2 cm, both surfaces green, blackening when dry, and subglabrous, base attenuate, margin sinuate-dentate to denticulate, apex acute. Middle and upper stem leaves sessile, narrowly ovate to linear and boat-shaped, 1.5–5 × 0.3–1 cm, both surfaces dark purple, abaxially sparsely pilose near base, base semianthecia, margin entire, apex acute to acuminate. Uppermost stem leaves merging into phyllaries, abaxially villous. *Capitulum* 1( or 2), subsessile. *Involucre* broadly obconic, 2–2.5 cm in diam. Phyllaries in 4 or 5 rows, blackish purple, densely villous, apex acute to acuminate; outer phyllaries triangular-ovate, 6–7 × 2.5–3.5 mm; middle phyllaries narrowly ovate to elliptic, 8–10 × 1–2 mm; inner phyllaries linear, 10–12 × 1.5–1.7 mm. Receptacle bristles 2–4 mm. *Corolla* purple, 1.2–1.3 cm, tube 6–7 mm, limb 6–7 mm, lobes 3.5–4 mm. Achene cylindric, 3–4 mm, smooth. *Pappus* straw-colored; outer bristles 1–3 mm; inner bristles 0.9–1.1 cm. *Fl. Aug, fr. Sep–Oct.*

- Alpine grasslands and meadows; 3200–3900 m. S Shaanxi (Taihai Shan).


裸头雪莲 luǒ tóu xuě lián


Herbs 9–35(–55) cm tall, perennial. Caudex stout, simple or few branched, apically with black fibrous remains of petioles. Stems solitary, 2–4 mm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade narrowly elliptic to elliptic, 4–18(–27) × 0.9–2.5(–3.8) cm, both surfaces gland-dotted, abaxially glaucous green and glabrescent, adaxially green and scabrous, base cuneate, margin subentire to minutely denticulate, apex acute to acuminate. Middle stem leaves sessile, narrowly elliptic and boat-shaped, 2.6 × 0.5–1.5 cm, half-enclosing synflorescence, both surfaces purple, margin entire. *Capitula* 1–4,
solitary or in a congested corymbiform synflorescence, shortly pedunculate. Involucre campanulate to obconic, 1.5–2.5 cm in diam. Phyllaries in 4 or 5 rows, straw-colored to purplish but with a dark margin, sparsely pilose, glabrescent, apex acuminate; outer phyllaries triangular-ovate, 8–10 × 3–4 mm; middle phyllaries narrowly ovate-elliptic, 10–14 × 1.5–2.5 mm; inner phyllaries linear, 14–17 × 1–1.5 mm. Receptacle bristles 4–6 mm. Corolla purple, 1.3–1.7 cm, tube 5–9 mm, limb 6–8 mm, lobes 3–5 mm. Achene brown, cylindric, 3–3.5 mm. Pap-ppus straw-colored; outer bristles 2–5 mm; inner bristles 1.1–1.3 cm. Fl. and fr. Jul–Sep.

- Marshlands, wet meadows; 3400–4300 m. Qinghai, W Sichuan, E Xizang.

This species has frequently been confused with Saussurea erubes-cens, due to an unfortunate, questionable synonymy by the monographer of the genus, Lipschitz. It is morphologically quite different from both S. obvallata and S. erubes-cens.


钝苞雪莲 dun bao xue lian

Herbs 8–50 cm tall, perennial. Stems solitary or few, 1–2 mm in diam., erect, simple. Basal and lower stem leaves peti-olate; leaf blade narrowly elliptic, 3.5–15 × 0.8–2.3 cm, both sur-faces green and sparsely villous but glabrescent, margin denti-culate, apex acute. Middle and upper stem leaves sessile, nar-rowly elliptic to linear, 2.8–7.7 × 0.6–1.1 cm, base semiamplexicaul, ovate to elliptic and boat-shaped, 2.5–15 × 0.8–2.3 cm, both surfaces green to purple, margin entire or dentate in basal part, apex acute to acuminate. Middle stem leaves sessile, narrowly ovate to linear and boat-shaped, 1.4–3 × 0.2–0.8 cm, not enclosing syn-florescence, both surfaces purplish, margin entire, apex acuminate. Capitula 1–3(–6), solitary or in a corymbiform synflorescence, pedunculate. Involucre campanulate to obconic, 1–1.5 cm in diam. Phyllaries in 4 or 5 rows, straw-colored to purple and with a dark margin, sparsely pilose, glabrescent, apex obtuse; outer phyllaries triangular-ovate, 5.6 × 2.5–4 mm; middle phyllaries narrowly ovate, 6.5–12 × 2–3 mm; inner phyllaries linear, 12–16 × 1–2 mm. Receptacle bristles 5–6 mm. Corolla purple, 1.3–1.8 cm, tube 7–9 mm, limb 5.5–9 mm, lobes 3–4 mm. Achene cylindric, ca. 3 mm. Pappus dirty white; outer bristles 1–3 mm; inner bristles 1.2–1.3 cm. Fl. and fr. Jul–Oct. 2n = 32*.

- Grasslands; 1900–4000 m. Gansu, W Henan, Qinghai, Shaanxi.


华中雪莲 hua zhong xue lian

Herbs 20–70 cm tall, perennial. Caudex simple or branched. Stems solitary, 3–6 mm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade narrowly ovate-elliptic to linear, 8–45 × 0.6–5 cm, both sur-faces green, sometimes spotted, abaxially glabrescent, adaxially sparsely villous, margin sinuate-dentate, apex acute. Middle and upper stem leaves sessile, ovate and boat-shaped, 3–8 × 0.6–3 cm, both surfaces green to purple, base semiamplexical, margin dentate to subentire, apex acuminate. Uppermost stem leaves ovate to elliptic and boat-shaped, 2.5–6.5 × 0.5–2.3 cm, membranous, half-enclosing synflorescence, both surfaces purple, margin subentire. Capitula (1 or)2–10, in a corym-biform synflorescence or rarely solitary, pedunculate. Involucre cylin-dric to obconic, 0.9–1.7 cm in diam. Phyllaries in 3 or 4 rows, villous, apex obtuse; outer phyllaries elliptic to suborbicular, 4.5–7.5 × 3–4.5 mm; middle phyllaries narrowly elliptic, 6–12 × 2–3 mm; inner phyllaries linear, 12–15 × 1.5–2.5 mm. Receptacle bristles 2.5–6(–10) mm. Corolla purple, 1.3–1.4 cm, tube 6–7 mm, limb 6.5–7.5 mm, lobes 4.2–5 mm. Achene dark brown, obovoid, 4.5–5.5 mm. Pappus pale brown; outer bristles 1–4 mm; inner bristles 1–1.1 cm. Fl. and fr. Jul–Sep.

- Grasslands, meadows, forests on mountain slopes; 1300–3500 m. Gansu, Hebei, Nei Mongol, Ningxia, Shaanxi, Shanxi.

The proximal part of multicellular flagellate hairs on leaves and peduncles is often remaining when the distal, long, hairlike part of the trichome is shed. These remaining basal parts are sometimes colored and are easily mistaken for glandular hairs. The two varieties of Saus-surea iodostegia, which have been distinguished based on this mis-leading character, both from the same locality, are not recognized here.


紫苞雪莲 zi bao xue lian

Saussurea iodostegia var. ferruginipes J. R. Drummon ex Handel-Mazzetti; S. iodostegia var. glandulifera X. Y. Wu.

Herbs (5–)10–80 cm tall, perennial. Caudex simple or few branched. Stems solitary or 2–4, 1.5–7 mm in diam., erect, simple. Rosette and lower stem leaves petiolate; leaf blade narrowly ovate-elliptic to linear, 8–45 × 0.6–5 cm, both sur-faces green, sometimes spotted, abaxially glabrescent, adaxially sparsely villous, margin sinuate-dentate, apex acute. Middle and upper stem leaves sessile, ovate and boat-shaped, 3–8 × 0.6–3 cm, both surfaces green to purple, base semiamplexical, margin dentate to subentire, apex acuminate. Uppermost stem leaves ovate to elliptic and boat-shaped, 2.5–6.5 × 0.5–2.3 cm, membranous, half-enclosing synflorescence, both surfaces purple, margin subentire. Capitula (1 or)2–10, in a corym-biform synflorescence or rarely solitary, pedunculate. Involucre cylin-dric to obconic, 0.9–1.7 cm in diam. Phyllaries in 3 or 4 rows, villous, apex obtuse; outer phyllaries elliptic to suborbicular, 4.5–7.5 × 3–4.5 mm; middle phyllaries narrowly elliptic, 6–12 × 2–3 mm; inner phyllaries linear, 12–15 × 1.5–2.5 mm. Receptacle bristles 2.5–6(–10) mm. Corolla purple, 1.3–1.4 cm, tube 6–7 mm, limb 6.5–7.5 mm, lobes 4.2–5 mm. Achene dark brown, obovoid, 4.5–5.5 mm. Pappus pale brown; outer bristles 1–4 mm; inner bristles 1–1.1 cm. Fl. and fr. Jul–Sep.

- Montane grasslands, meadows, thickets, forest margins; 1600–3000 m. E Chongqing, W Hubei, SE Shaanxi.


Theodorea (Cassini) Cassini.

Herbs, biennial or perennial. Stems usually tall, many branched, leafy. Capitula usually numerous to very numerous, in a corym-
biform or paniculiform synflorescence. Phyllaries imbricate, margin sometimes dentate, all or only middle and inner phyllaries with colored and membranous or green and herbaceous apical appendage; appendage sometimes inconspicuous or apex spiniform-acuminate. Receptacle with subulate or filiform bristles. Corolla limb deeply cleft (more than 2/3–4/5), usually gland-dotted. Achene smooth or ribbed, sometimes wrinkled, glabrous or gland-dotted, without a conspicuous apical crown. Pappus white, straw-colored, or pale brown, always in 2 rows; outer bristles sebrad or rarely plumose.

Twenty species: China, Japan, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Russia, Tajikistan, Uzbekistan; Europe; 17 species (seven endemic) in China.

1a. Phyllaries without a conspicuous appendage, apex cartilaginous, spiniform, and usually reflexed.
2a. Capitula numerous; plants biennial or perennial, without woody caudex ........................................................... 66. *S. malitiosa*
2b. Capitulum solitary; plants perennial, with a stout woody caudex ........................................................... 67. *S. jurineoides*
1b. Phyllaries with a ± widened, membranous, or callose-serrulate appendage, apex not spiniform but sometimes needlelike or ± long acuminate.
3a. Phyllaries or at least inner ones with a small herbaceous callose-serrulate apical appendage.
  4a. Leaf blade undivided, margin entire ........................................................... 72. *S. chinnampoensis*
  4b. Leaf blade pinnatisect, pinnately lobed, or margin sinuate-lobate.
   5a. Leaf blade adaxially green, sparsely pubescent, abaxially pale grayish green, sparsely arachnoid; inner phyllaries apically not barbellate ........................................................... 70. *S. nematolepis*
   5b. Leaf blade green, concolorous, sparsely strigose; inner phyllaries apically densely barbellate .............................. 71. *S. ladyginii*
3b. Phyllaries or at least inner ones with a purple membranous apically widened but sometimes inconspicuous appendage.
  6a. Outer phyllaries with an apical cartilaginous mucro.
   7a. Plants biennial ........................................................... 68. *S. pseudomalitiosa*
   7b. Plants perennial.
   8a. Stems wingless or wing inconspicuous ........................................................... 62. *S. runcinata*
   8b. Stems conspicuously winged.
   9a. Basal leaves bipinnately parted; apex of outer phyllaries reflexed ........................................................... 63. *S. laciniata*
   9b. Basal leaves pinnately parted to undivided; apex of outer phyllaries not or barely reflexed.
   10a. Basal leaves lyrate-pinnately lobed to undivided and with sinuate-dentate or subentire margin ........................................................... 64. *S. grubovii*
   10b. Basal leaves pinnately lobed or pinnately parted .................................................. 65. *S. alata*
  6b. Outer phyllaries without an apical cartilaginous mucro.
   11a. Outer phyllaries with a long needlelike recurved apex ........................................ 60. *S. robusta*
   11b. Outer phyllaries without a needlelike apex.
   12a. Involucre cylindric, narrowly obconic, or narrowly campanulate; outer phyllaries without a membranous appendage.
   13a. Stem usually wingless ........................................................... 56. *S. amara*
   13b. Stem winged.
   14a. Middle and upper stem leaves ovate, base amplexicaul, margin entire and undivided ........................................................... 57. *S. chingiana*
   14b. Middle and upper stem leaves narrowly elliptic to linear, base not amplexicaul, margin pinnately lobed or dentate .............................. 61. *S. prostrata*
12b. Involucre globose, ovoid, or campanulate; all phyllaries usually with a membranous appendage.
   15a. Involucre globose, 10–15 mm in diam.; phyllary appendages showy, 2–3 mm wide, usually overlapping ........................................................... 59. *S. pulchella*
   15b. Involucre campanulate, 4–10 mm in diam.; phyllary appendages not showy, 1–2 mm wide, not overlapping.
   16a. Stem usually wingless; involucre cylindric to narrowly campanulate; outer phyllaries sometimes without an appendage ........................................................... 58. *S. japonica*
   16b. Stem narrowly winged; outer phyllaries with an appendage.
   17a. Involucre tubular to narrowly campanulate, 4–6 mm in diam.; capitula numerous in a large corymbiform synflorescence ........................................................... 58. *S. japonica*
   17b. Involucre campanulate, 8–10 mm in diam.; capitula solitary or few at branch ends ........................................................... 69. *S. pinnatidentata*


草地风毛菊 cao di feng mao ju
glabrous, and gland-dotted, base cuneate-attenuate, margin entire or obtusely sinuate-dentate, apex acute to obtuse. Middle and upper stem leaves shortly petiolate or sessile, elliptic to narrowly ovate, gradually smaller upward on stem, base cuneate and rarely auriculate. Capitula numerous, in a corymbiform or paniculiform synflorescence, pedunculate. Involute narrowly campanulate to narrowly obconic, 0.8–1.2 cm in diam. Phyllaries in 4–6 rows, sparsely pubescent, sometimes gland-dotted; outer phyllaries ovate to narrowly ovate, 3–5 × 1–1.5 mm, apex blackish and acuminate or tricuspidate; middle and inner phyllaries narrowly elliptic to linear, 5–14 × 1–1.5 mm, appendage purple, orbicular, 0.5–1.5 mm wide, and membranous or rarely appendage lacking. Receptacle bristles 8–10 mm. Corolla pale purple, rarely white, 1.3–1.8 cm, gland-dotted, tube 8–10 mm, limb 5–7 mm, lobes 3–5 mm. Achene brown, cylindric, 3–3.5 mm, 4-ribbed. Pappus dirty white; outer bristles 1–5 mm; inner bristles 1.2–1.7 cm. Fl. and fr. Jul–Oct. 2n = 26.

Wastelands, by trails, forest steppes, steppes, saline and alkaline soils, dikes of streams, dunes, river and lake shores, sandy soils; 500–3200 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Uzbekistan; E Europe].

The type of *Saussurea tenuicaulis* has the upper stem leaves with a widened auriculate base, a character not found in typical specimens of *S. amara*. Such plants may deserve separate taxonomic status.

1a. Middle and inner phyllaries with a purple appendage; corolla pale purple .................. 56a. var. *amara*

1b. All phyllaries acuminate at apex and without an appendage; corolla white ...................... 56b. var. *exappendiculata*

56a. *Saussurea amara* var. *amara*

草地风毛菊(原变种) cao di feng mao ju (yuan bian zhong)

*Serratula amara* Linnaeus, Sp. Pl. 2: 819. 1753; *Saussurea amara* var. *glomerata* (Poiret) Trautvetter; *S. amara* f. *microcephala* Franchet; *S. glomerata* Poiret; *S. tenuicaulis* Y. Ling.

Middle and inner phyllaries with a purple membranous appendage. Corolla pale purple.

Wastelands, by trails, forest steppes, steppes, saline and alkaline soils, dikes of streams, dunes, river and lake shores; 500–3200 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Uzbekistan; E Europe].


尖苞草地风毛菊 jian bao cao di feng mao ju

All phyllaries without an apical appendage, apex acuminate. Corolla white.

Sandy soils. Nei Mongol (Dulad Qi, Ih Ju Meng).


抱茎风毛菊 bao jing feng mao ju

Herbs 45–100 cm tall, ?perennial. Stem solitary, 5–10 mm in diam., erect, apically much branched, narrowly winged. Lower stem leaves petiolate; leaf blade narrowly elliptic to narrowly ovate, 5–20 × 1–4 cm, runcinate-pinnatifid or undivided, both surfaces green, sparsely striose or glabrescent, and gland-dotted, base decurrent; lateral lobes (if present) narrowly triangular to linear, margin entire, apex acuminate. Middle and upper stem leaves ovate to linear, 1–6 × 0.2–2.5 cm, undivided, base auriculate and amplexicaul, margin entire, apex acuminate. Capitula numerous, clustered at end of branches, in a corymbiform synflorescence, sub sessile or pedunculate. Involute campanulate, 1–1.5 cm in diam. Phyllaries in 5 or 6 rows, straw-colored to green, distinctly striate, sparsely arachnoid or glabrous; outer phyllaries narrowly ovate-triangular, 2–3 × 1–1.5 mm, apex acuminate; middle and inner phyllaries narrowly ovate-elliptic to linear, 3–10 × 1–1.7 mm, appendage purple, orbicular, widened, and membranous. Receptacle bristles whitish, to 8 mm. Corolla reddish purple, 1.3–1.4 cm, tube 4–6 mm, limb 7–8 mm, lobes 3–3.5 mm. Achene obovoid, ca. 3 mm, glabrous. Pappus dirty white; outer bristles ca. 3 mm; inner bristles ca. 1.4 cm. Fl. and fr. Jul–Aug.

• Forests, gravelly open soil near rivers, by trails and ditches; ca. 2400 m. Gansu.

*Saussurea chingiana* is only known from the incomplete type, which lacks basal and underground parts. The plants from Qinghai (S. W. Liu, Fl. Qinghai. 3: 461. 1996) do not belong here but are winged forms of *S. japonica* (see *S. japonica* var. *pteroclada*).


风毛菊 feng mao ju

Herbs (0.2–)0.5–2 m tall, biennial. Stem solitary, 3–10 mm in diam., erect, much branched. Lower stem leaves petiolate; leaf blade elliptic to narrowly ovate-elliptic, 7–30 × 3.5–9 cm, pinnately lobed, both surfaces green, scabrous, and gland-dotted; lateral lobes 5–8 pairs, obliquely triangular to linear-oblong, margin usually entire, apex obtuse; terminal lobe narrowly ovate-elliptic to linear. Middle and upper stem leaves shortly petiolate or sessile, gradually smaller upward on stem, pinnately lobed or undivided. Capitula very numerous, in a corymbiform or paniculiform synflorescence, shortly pedunculate. Involute narrowly campanulate, 5–8(–10) mm in diam. Phyllaries in 5 or 6 rows, green with a dark purple midvein, arachnoid to glabrescent, gland-dotted, apical appendage purple, orbicular, 1–2 mm wide, and membranous; outer phyllaries ovate to narrowly triangular-ovate, 2–3 × 1–1.5 mm, apex acute or with a small appendage; middle and inner phyllaries narrowly elliptic to linear, 4–10 × 0.8–1.5 mm, apex with a larger appendage. Receptacle bristles 5–6 mm. Corolla purple, 1–1.4 cm, gland-dotted, tube 6–8 mm, limb 4–6 mm, lobes 4–5 mm. Achene straw-colored with dark spots, cylindric to obconic, 3–4 mm. Pappus dirty white; outer bristles ca. 2 mm; inner bristles 7–9 mm. Fl. and fr. Jun–Nov. 2n = 26, 28.

Mountain slopes, forests, thickets, loess slopes, roadsides, wastelands, fallow fields; 200–2900 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea, Mongolia].
S. japonica has often been confused with *S. amara* (e.g., S. W. Liu, Fl. Yunnan. 13: 538. 2004), mainly because many herbarium specimens lack underground and basal parts. *S. amara* is a perennial species with undivided basal leaves of steppe and often saline and alkaline soils in N and W parts of the country, whereas *S. japonica* is a very widespread tall biennial plant with pinnatifid to pinnatisect basal leaves in a variety of habitats but usually not on saline soils. *S. japonica* seems to be absent from Xinjiang and Xizang. Plants in the SE part of the country tend to have smaller capitula (matching *S. microcephala*) and may deserve separate taxonomic status.

### 1a. Stem not winged; leaf blade base not or very shortly decurrent


### 58a. *S. japonica* var. *japonica*

风毛菊（原变种）feng mao ju （yuán biàn zhòng）

*Serratula japonica* Thunberg in Murray, Syst. Veg., ed. 14, 723. 1784; *Saussurea amara* (Linnaeus) Candolle var. *microcephala* (Fanchet) Lipschitz (1979), not *S. amara* f. *microcephala* Franchet (1883); *S. glomerata* Poiret var. *chinensis* F. H. Chen; *S. intermedia* Turczaninow; *S. japonica* var. *intermedia* (Turczaninow) Lipschitz; *S. japonica* f. *leucocephala* (Nakai & Kitagawa) Nakai & Kitagawa; *S. japonica* var. *longiceps* Hayata; *S. japonica* var. *maritima* Kitagawa; *S. linearis* Champion ex Bentham; *S. microcephala* Franchet; *S. microcephala* f. *aptera* Nakai & Kitagawa; *S. microcephala* f. *leucocephala* Nakai & Kitagawa; *S. taquetii* H. Léveillé & Vaniot.

Stem not winged. Leaf blade base not or very shortly decurrent.

Mountain slopes, forests, thickets, loess slopes, roadsides, wastelands, fallow fields; 200–2800 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea, Mongolia, Russia (Far East, E Siberia)].

Winged forms of *S. japonica* have not been distinguished in China.


美花风毛菊 mei hua feng mao ju


Herbs 25–120 cm tall, biennial. Stem solitary, 3–6 mm in diam., erect, apically branched. Basal, lower, and middle stem leaves petiolate; leaf blade oblong to elliptic, 10–25 × 4–14 cm, pinnately lobed to pinnatisect, both surfaces green, scabrous, strigose, and gland-dotted, sometimes abaxially grayish white tomentose; segments 4–8 pairs, narrowly ovate-elliptic to linear, margin entire or dentate, apex acuminate. Upper stem leaves sessile, narrowly ovate-elliptic to linear, 4–12 × 0.1–2 cm, pinnately lobed to pinnatisect or undivided. Capitula numerous, in a corymbiform or paniculiform synflorescence, pedunculate. Involucre globose, 0.8–1.5 cm in diam. Phyllaries in 6 or 7 rows, subglabrous and gland-dotted, all with an apical appendage; appendage purple, orbicular, 2–3 mm wide, membranous; outer phyllaries narrowly triangular-ovate to linear, 2–3 × 0.5–1.5 mm; middle and inner phyllaries narrowly ovate-elliptic to linear, 4–11(–15) × 1–3 mm. Receptacle bristles 4–6 mm. Corolla pale purple, 1.1–1.3 cm, gland-dotted, tube 5–8 mm, limb 4–6.5 mm, lobes 4–5 mm. Achene ivory-colored with dark spots, obconic, 3–5 mm, obtusely 5-angled. Pappus dirty white; outer bristles 0.5–2.5 mm; inner bristles 7–8(–13) mm. Fl. and fr. Aug.–Oct. 2n = 26, 28.

Forest steppes, thickets, meadows; 300–2000 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi [Japan, Korea, Mongolia, Russia (Far East, E Siberia)].

Winged forms of *S. pulchella* (S. *pulchella* var. *alata*) have not been distinguished in China.


强壮风毛菊 qiáng zhuàng feng mao ju

Herbs 30–80 cm tall, biennial or perennial. Stem solitary, 5–6 mm in diam., erect, branched, narrowly winged. Basal and lower stem leaves sessile, oblanceolate, 6–20 × 1–6 cm, both surfaces green, scabrous, and gland-dotted, base semiamplexicaul and decurrent, margin entire or sparsely dentate, apex acuminate. Middle and upper stem leaves sessile, narrowly ovate-elliptic to linear, 5–8 × 0.5–1.5 cm, margin entire, apex acuminata. Capitula numerous, in a corymbiform or paniculiform synflorescence, pedunculate. Involucrue campanulate, (0.6–)1–2(–3) cm in diam. Phyllaries in ca. 5 rows; outer phyllaries narrowly tri-
angular-subulate, 8–11 × 1–2 mm, basally arachnoid lanate, apically glabrous, apex needlelike and reflexed; middle and inner phyllaries subulate to linear, 10–14 × 1–2 mm, densely arachnoid lanate and gland-dotted, appendage narrowly triangular to ovate, 0.5–1 mm wide, and membranous. Receptacle bristles filiform, 7–9 mm, hyaline. Corolla purple, 1.6–1.9 cm, gland-dotted, tube 0.9–1.2 cm, limb 6–7 mm, lobes 3.5–4.5 mm. Achene blackish brown, cylindric, 2–3 mm. Pappus pale yellowish brown; outer bristles 2–3 mm; inner bristles 7–9 mm. Fl. and fr. Jul–Sep.

River and lake shores, rock fissures near moist places, saline lowlands, saline and alkaline soils, salt and alkaline marshes; 700–1300 m. Hebei, Heilongjiang, Jilin, Nei Mongol, Ningxia, Shaanxi, Shanxi [Mongolia, Russia (Siberia)].

1a. Basal and lower stem leaves lyrate to pinnatisect; involucre campanulate to tubular-campanulate, 5–10 mm in diam. .............................................. 62a. var. runcinata
1b. Basal and lower stem leaves undivided; involucre narrowly tubular, 4–5 mm in diam. ................................. 62b. var. integrifolia

62a. Saussurea runcinata var. runcinata

倒羽叶风毛菊 (原变种) dao yu ye feng mao ju (yuan bian zhong)

Saussurea alata Candolle var. runcinata (Candolle) Herder; S. crepidifolia Turczaninow.

Basal and lower stem leaves lyrate, pinnately parted, or pinnatisect; lateral lobes 1–7 pairs, narrowly triangular, elliptic, falcate, or linear, recurved to patent, margin usually entire or sometimes dentate, apex acute to obtuse and with a cartilaginous mucro; terminal lobe narrowly ovate, narrowly triangular, or linear, margin entire or dentate, apex acute to obtuse. Involucre campanulate to tubular-campanulate, 5–10 mm in diam.

River and lake shores, rock fissures near moist places, saline lowlands, saline and alkaline soils, salt and alkaline marshes; 700–1300 m. Hebei, Heilongjiang, Jilin, Nei Mongol, Ningxia, Shaanxi, Shanxi [Mongolia, Russia (Siberia)].


全叶石咸地风毛菊 quan ye shi xian di feng mao ju

All leaves undivided, margin entire. Involucre narrowly tubular, 4–5 mm in diam.

- Salt and alkaline marshes. Nei Mongol.


裂叶风毛菊 lie ye feng mao ju

Saussurea alata Candolle var. laciniata (Ledebour) Herder; S. laciniata var. pygmaea Lipschitz.

Herbs 15–60 cm tall, perennial. Stems solitary or few, erect, simple or branched from base, narrowly winged; wings entire or dentate. Basal and lower stem leaves petiolate; petiole 1–5 cm; leaf blade narrowly obovate, narrowly ovate-elliptic, or linear, 4–20 × 0.5–7 cm, lyrate, pinnately parted, pinnatisect, or undivided, both surfaces green and glabrous. Middle and upper stem leaves sessile, narrowly elliptic to linear, undivided, margin entire or basally dentate. Capitula few to numerous, in a corymbiform or paniculiform synflorescence, shortly pedunculate. Involucre tubular to campanulate, 4–10 mm in diam. Phyllaries in 4–6 rows, glabrous or glabrously pubescent; outer phyllaries ovate to narrowly ovate, ca. 3.5 × 1.5 mm, appendage widened, herbaceous, and with a cartilaginous mucro; middle and inner phyllaries narrowly elliptic to linear, 7–10 × 1–1.8 mm, appendage red, widened, membranous, and denticulate. Corolla purplish red, 1–1.5 cm, gland-dotted, tube 7–8 mm, limb 6–8 mm, lobes 3–4 mm. Achene blackish brown, cylindric, 2–3 mm. Pappus pale yellowish brown; outer bristles 2–3 mm; inner bristles 7–9 mm. Fl. and fr. Jul–Sep.

Grassy shores, salt marshes, wastelands, saline soils; 700–2000 m. NW Xinjiang [Kazakhstan, Mongolia, Russia (Siberia)].


全叶石咸地风毛菊 quan ye shi xian di feng mao ju

Herbs 10–60 cm tall, biennial or perennial. Stems solitary or several, procumbent, ascending, or erect, simple or branched in upper half, distinctly winged. Stem leaves narrowly elliptic to linear, 1.5–2.5 × 0.3–0.7 cm, both surfaces green, scabrid, and pilose, base long decurrent, margin pinnately lobed or dentate, apex acute. Capitula 1–8, solitary or clustered in a corymbiform synflorescence, sessile or shortly pedunculate. Involucre campanulate, (0.5–)1–1.5 cm in diam. Phyllaries in 4 or 5 rows, greenish with dark midvein, villous to glabrescent; outer phyllaries narrowly elliptic, 2–4 × 1–2 mm, erect or slightly recurved, apex acuminate; middle phyllaries narrowly elliptic, 4–8 × 1–2 mm, appendage dark, widened, and cuspidate; inner phyllaries linear, 8–11 × 1.5–2 mm, appendage purple, suborbicular, widened, membranous, and denticulate. Receptacle bristles 7–8 mm. Corolla purple, 1.7–1.8(–2) cm, tube ca. 1 cm, lobes ca. 5 mm. Achene brown dark, cylindric, ca. 3.5 mm, ribbed, glabrous. Pappus white; outer bristles to 5 mm; inner bristles 7–8 mm. Fl. and fr. Jul–Aug.

Salt meadows, saline and alkaline sandy soils; 500–2500 m. Xinjiang [Kazakhstan, Kyrgyzstan].


倒羽叶风毛菊 dao yu ye feng mao ju

Herbs (5–)15–50 cm tall, perennial. Stems solitary or few, procumbent, ascending, or erect, simple or branched in upper half, distinctly winged. Stem leaves narrowly elliptic to linear, 1.5–2.5 × 0.3–0.7 cm, both surfaces green, scabrid, and pilose, base long decurrent, margin pinnately lobed or dentate, apex acute. Capitula 1–8, solitary or clustered in a corymbiform synflorescence, sessile or shortly pedunculate. Involucre campanulate, (0.5–)1–1.5 cm in diam. Phyllaries in 4 or 5 rows, greenish with dark midvein, villous to glabrescent; primary phyllaries ovate, 0.5–1 mm wide, and membranous. Receptacle bristles ca. 1.2 cm. Fl. and fr. Jul–Aug.

Grassy shores, salt marshes, wastelands, saline soils; 700–2000 m. NW Xinjiang [Kazakhstan, Mongolia, Russia (Siberia)].


裂叶风毛菊 lie ye feng mao ju

Saussurea alata Candolle var. pygmaea Lipschitz.

Herbs 15–60 cm tall, perennial. Stems solitary or few, erect, apically branched, covered with fibrous lacerate remains of petioles at base, wingless or narrowly winged; wings entire or dentate. Basal and lower stem leaves petiolate; petiole 1–5 cm; leaf blade narrowly obovate, narrowly ovate-elliptic, or linear, 4–20 × 0.5–7 cm, lyrate, pinnately parted, pinnatisect, or undivided, both surfaces green and glabrous. Middle and upper stem leaves sessile, narrowly elliptic to linear, undivided, margin entire or basally dentate. Capitula few to numerous, in a corymbiform or paniculiform synflorescence, shortly pedunculate. Involucre tubular to campanulate, 4–10 mm in diam. Phyllaries in 4–6 rows, glabrous or glabrously pubescent; outer phyllaries ovate to narrowly ovate, ca. 3.5 × 1.5 mm, appendage widened, herbaceous, and with a cartilaginous mucro; middle and inner phyllaries narrowly elliptic to linear, 7–10 × 1–1.8 mm, appendage red, widened, membranous, and denticulate. Corolla purplish red, 1–1.5 cm, gland-dotted, tube 7–8 mm, limb 6–8 mm, lobes 3–4 mm. Achene blackish brown, cylindric, 2–3 mm. Pappus pale yellowish brown; outer bristles 2–3 mm; inner bristles 7–9 mm. Fl. and fr. Jul–Sep.

River and lake shores, rock fissures near moist places, saline lowlands, saline and alkaline soils, salt and alkaline marshes; 700–1300 m. Hebei, Heilongjiang, Jilin, Nei Mongol, Ningxia, Shaanxi, Shanxi [Mongolia, Russia (Siberia)].

1a. Basal and lower stem leaves lyrate to pinnatisect; involucre campanulate to tubular-campanulate, 5–10 mm in diam. .............................................. 62a. var. runcinata
1b. Basal and lower stem leaves undivided; involucre narrowly tubular, 4–5 mm in diam. ................................. 62b. var. integrifolia
phyllaries narrowly ovate, 4–5 × 1.5–2 mm, appendage green, herbaceous, reflexed, and mucronate; middle phyllaries narrowly ovate-elliptic, 6–8 × 1.5–2 mm, appendage green, herbaceous, widened, margin dentate, and apex mucronate; inner phyllaries narrowly elliptic to linear, 9–11 × 1.5–2 mm, appendage purplish, membranous, villous and gland-dotted, and margin erose-denticulate. Corolla reddish purple, 1–1.4 cm, tube 6–7 mm, limb 4–6 mm, lobes 3–4 mm. Achene dark brown, cylindric to obconic, (2–)3–4 mm. Pappus yellowish white; outer bristles 1–5 mm, scabrid to plumose; inner bristles 9–10 mm. Fl. and fr. Jul–Aug. 2n = 28.

Desert steppes, saline and alkaline soils; 1300–2200 m. Gansu, Nei Mongol, Ningxia, Shaanxi, Xinjiang [Kazakhstan, Mongolia, Russia (Siberia)].


蒙新风毛菊 meng xin feng mao ju

*Saussurea paradoxa* Lipschitz.

Herbs 30–80 cm tall, perennial. Stems solitary or few, erect, simple or branched in upper part, narrowly winged. Basal and lower stem leaves petiolate; leaf blade ovate, elliptic, obovate, or oblong, 5–20 × 2.5–5 cm, thick, fleshy, lyrate, pinnately lobed, or undivided, both surfaces green, scabrous, and appressed pubescent, base cuneate, margin sinuate-dentate or entire, apex acute. Middle and upper stem leaves shortly petiolate or sessile, narrowly ovate, obovate, elliptic, or linear, 2.5–5 × 0.5–2 cm, margin entire. Capitula clustered 2–6 at end of stem and branches, in a corymbiform synflorescence, shortly pedunculate. Involucre campanulate, 5–10 mm in diam. Phyllaries in 5 or 6 rows; outer phyllaries narrowly ovate, 2–4 × 1–2 mm, apex acuminately with a cartilaginous mucro; middle and inner phyllaries narrowly elliptic to linear, 3–8 × 1–2 mm, appendage pink, widened, and membranous. Receptacle densely bristly. Corolla pink, 1.2–2 cm, tube 6–12 mm, limb 6–8 mm, lobes ca. 5 mm. Achene light brown, cylindric, ca. 3.5 mm, ribbed. Pappus white; outer bristles 0.5–3 mm; inner bristles [0.8–]1.2–1.4 cm. Fl. and fr. Jul–Sep.

Salt marshes, fallow and cultivated fields, sandy soils; 500–1200 m. Nei Mongol, Xinjiang [Mongolia, Russia (Siberia)].


具翅风毛菊 ju chi feng mao ju

*Saussurea runcinata* Candolle var. dentata Ledebour.

Herbs, perennial, 20–70 cm tall. Stem solitary, erect, apically branched, winged; wings entire or dentate. Basal leaves petiolate; leaf blade narrowly elliptic, 10–20 × 1–6 cm, lyrate, pinnately lobed, pinnatisect, or rarely undivided, both surfaces green, strigose, and gland-dotted; lateral lobes triangular to narrowly ovate-elliptic, margin sinuate-dentate or entire, apex with cartilaginous mucro. Lower and middle stem leaves petiolate or sessile, gradually smaller upward on stem. Upper stem leaves sessile, narrowly elliptic to linear, margin entire. Capitula numerous, in a corymbiform or paniculiform synflorescence, sessile or pedunculate. Involucre cylindric to ovoid, 8–10 mm in diam. Phyllaries in ca. 5 rows; outer phyllaries narrowly ovate-elliptic, ca. 4 × 1.5 mm, apex acute to obtuse; middle phyllaries narrowly elliptic, 5–6 × ca. 2 mm, apex obtuse to rounded; inner phyllaries narrowly elliptic to linear, ca. 8 × 2 mm, appendage purple, widened, membranous, and denticulate. Receptacle bristles 4–5 mm. Corolla purplish red, 1.1–1.6 cm, tube ca. 6 mm, limb ca. 8 mm, lobes ca. 3 mm. Achene dark brown, obconic to cylindric, 3–4 mm. Pappus straw-colored; outer bristles 2–5 mm; inner bristles 8–10 mm. Fl. and fr. Jul–Sep.

Salt marshes, fallow and cultivated fields, sandy soils; 500–1200 m. Nei Mongol, Xinjiang [Mongolia, Russia (Siberia)].


尖头风毛菊 jian tou feng mao ju

Herbs 10–40 cm tall, biennial or perennial. Stem solitary, 3–10 mm in diam., erect, simple or branched, usually wingless. Basal leaves petiolate; leaf blade narrowly obovate, oblong, or narrowly elliptic, 2–12 × 0.5–2.5 cm, pinnately lobed or pinnatisect, both surfaces green, strigose, gland-dotted, and scabrous; lateral lobes linear, narrowly ovate-elliptic, or narrowly triangular, recurved, margin entire or dentate, apex acute to acuminate and with cartilaginous mucro. Middle and upper stem leaves sessile, base semiamplexicaul. Capitula usually 3–15, clustered in a terminal corymbiform synflorescence or sometimes solitary on lower branch ends, sessile or pedunculate. Involucre campanulate, 1–2 cm in diam. Phyllaries in 5–7 rows, densely villous, apex long acuminate to spiniform and with a cartilaginous tip; outer phyllaries ovate to narrowly ovate-elliptic, 8–12 × 3–4 mm, apical part usually reflexed; middle phyllaries narrowly ovate-elliptic, 10–20 × 2–3 mm, apical part reflexed to patent; inner phyllaries linear, 2.5–5 × 0.1–0.2 cm, appressed. Receptacle bristles 0.8–1.4 cm. Corolla pink, 2–2.5 cm, gland-dotted, tube 1–1.2 cm, limb 1.3–1.4 cm, lobes 5–6 mm. Achene obconic, ca. 2 mm, wrinkled, gland-dotted. Pappus white; outer bristles 1–2 mm; inner bristles 1.8–2 cm. Fl. and fr. Jun–Sep.

* Sandy and gravelly mountain slopes; 3000–4300 m. W Gansu, Qinghai.


阿右风毛菊 a you feng mao ju

Herbs 10–20 cm tall, perennial. Caudex stout, densely covered with dark brown remains of petioles. Stems solitary or few, erect, simple. Lower stem leaves petiolate; petiole 2–3 cm; leaf blade elliptic to narrowly ovate-elliptic, 5–8 × 1.5–2 cm, pinnately lobed or pinnatisect, both surfaces green, pilose, and gland-dotted; lateral lobes 4–8, narrowly ovate to linear, margin entire or sparsely dentate, apex acuminate and mucronate; terminal lobe linear to narrowly ovate-elliptic, margin entire, apex acuminate. Middle and upper stem leaves narrowly ovate-elliptic to linear, gradually smaller upward on stem, pinnately lobed.
or margin dentate. Capitulum solitary. Involucre broadly campanulate, 1.5–2 cm in diam. Phyllaries in ca. 5 rows, yellowish green, densely villous and gland-dotted, apex spiniform, reflexed, and with a cartilaginous tip; outer phyllaries ovate to narrowly ovate; middle phyllaries narrowly ovate; inner phyllaries narrowly ovate to linear. Receptacle bristly. Corolla purple, ca. 1.8 cm, tube ca. 1 cm, limb ca. 8 mm, lobes ca. 3 mm. Achene brown, cylindric, 3–4 mm, sparsely puberulent and glandular. Pappus white; inner bristles ca. 1.7 cm. Fl. and fr. Jul–Aug.

- Stony mountain slopes; 2400–2500 m. Nei Mongol (Alxa Meng).

No specimens of *Saussurea jurinoides* were seen by the present authors, and the description here is based on the original publication. It is very close to *Saussurea multiloba*, differing from that species only in the stout caudex and the solitary capitulum with somewhat smaller florets.


69. *Saussurea runcinata* Candolle var. *pinnatidentata* (Lipschitz) A. C. Fu & D. C. Wen.

- Juniperus and *Picea* forests, open mountain slopes; 3300–4200 m. Qinghai.


middle and inner phyllaries narrowly ovate to narrowly elliptic, 6–9 × 1.8–2 mm, appendage greenish, herbaceous, gland-dotted, and densely villous. Receptacle bristles ca. 4 mm. Corolla purplish red, 9–10 mm, gland-dotted, tube 3–4 mm, limb ca. 6 mm. Achene dark brown, obconic, 3.5–4 mm. Pappus pale brown; outer bristles 2–3 mm; inner bristles 7–8 mm. Fl. and fr. Aug.

- About 3500 m. Qinghai.

**Saussurea ladyni** is only known from the type. It is morphologically very close to *S. pseudomalitiosa* but differs from that species in the shape and color of the phyllaries.


**京风毛菊 jìng fēng mào ju**

*Saussurea chinampoenensis* var. *gracilis* H. C. Fu & D. S. Wen; *S. peipingensis* F. H. Chen.

Herbs 10–60(–100) cm tall, biennial. Stem solitary, erect, branched from base. Basal leaves shortly petiolar; leaf blade linear, narrowly ovate, narrowly elliptic, or narrowly obovate, 4–13 × 0.4–1 cm, thick, scabrous, gland-dotted, base attenuate-cuneate, margin revolute, subentire, mucronulate, apex acute to obtuse. Lower and middle stem leaves sessile, gradually smaller upward on stem, base semiamplexicaul. Capitula solitary or few on ends of branches in a corymbose or paniculiform synflorescence, pedunculate. Involucre broadly campanulate to hemispheric, 1–2 cm in diam. Phyllaries in 4–6 rows, narrowly ovate-elliptic to linear, green, gland-dotted; outer phyllaries 4–8 × 1.5–2 mm, apex cartilaginous mucronate; middle phyllaries 8–10 × 1.5–2 mm, appendage green, herbaceous, margin and apically cartilaginous mucronate; inner phyllaries 10–13 × 1.5–2 mm, appendage green to purple, herbaceous, brownish tomentose, acuminate, and recurved. Receptacle bristles white, filiform, 6–9 mm. Corolla pale purple, 1.2–1.6 cm, gland-dotted, tube 8–11 mm, limb 5–6 mm, lobes 4–4.5 mm. Achene cylindric, ca. 3 mm, ribbed. Pappus pale yellowish brown; outer bristles 3–5 mm; inner bristles 7–10 mm. Fl. and fr. Jul.–Oct.

About 333 species: Asia, C, E, and N Europe, W North America; 217 species (152 endemic) in China.

4. **Saussurea**

**风毛菊亚属 fēng mào ju yà shù**

Perennial herbs or rarely subshrubs, cauliforous or stemless. Leaves undivided or pinnately divided. Uppermost stem leaves herbaceous, green, not densely lanate. Capitula usually in a corymbiform or paniculiform synflorescence or sometimes solitary. Phyllaries usually without an appendage but sometimes with a green herbaceous appendage, apex obtuse, acute, acuminate, or caudate and usually appressed or sometimes reflexed. Receptacle usually densely bristly, rarely paleate, papillose, or naked. Corolla usually glabrous, rarely gland-dotted. Anther tails ± lacerate, lanate, or entire. Achene cylindric, oblong, or fusiform, usually less than 1 cm in diam. Pappus bristles in 1 row.

1a. Subshrubs, repeatedly virgately branched from base ................................................................. 1. *S. sect. Jurineiformes*

1b. Perennial herbs or rarely subshrubs, never virgately branched.

2a. Phyllaries straw-colored, with a black or brown membranous margin; receptacle with paleae as long as or longer than inner phyllaries; pappus bristles in 1 row ......................................................... 2. *S. sect. Jacea*

2b. Phyllaries straw-colored, greenish, yellow, brown, purple, or black, without a black or brown membranous margin; receptacle with bristles shorter than inner phyllaries or naked; pappus bristles usually in 2 rows.

3a. Plants stemless or substemless and sometimes forming dense cushions; leaves undivided, usually less than 2 cm wide, if wider then margin dentate or serrate; capitula usually solitary, rarely few or numerous ........................................................................................................... 3. *S. sect. Gymnocline*

3b. Plants usually with well-developed stem, if stemless then leaves either pinnately lobed to pinnately divided or leaf blade more than 2 cm wide and with an entire margin; capitula in a corymbiform, paniculiform, or racemiform synflorescence or solitary.

4a. Roots and caudex fibrously split; capitula usually numerous, in a corymbiform or paniculiform synflorescence; involucre cylindric, tubular, or narrowly campanulate, usually less than 1 cm in diam. ................................................................. 4. *S. sect. Laguranthera*

4b. Roots and caudex not fibrously split; capitula solitary to numerous; involucre usually campanulate, more than 1 cm in diam.

5a. Anther tails ciliate or lanate, rarely lacerate; capitula mostly solitary and usually more than 1.5 cm in diam.

6a. Leaf blade undivided, narrowly linear and grasslike, or narrowly obovate, narrowly ovate-elliptic to narrowly obovate-elliptic ................................................................. 5. *S. sect. Lagropestemon*

6b. Leaf blade usually pinnately lobed to pinnately divided, if rarely undivided then not narrowly linear and grasslike but elliptic, obovate, or oblong ......................................... 6. *S. sect. Strictae*

5b. Anther tails ciliate or lanate, not corynthy or lanate; capitula usually numerous and less than 1.5 cm in diam.
7a. Plants scapiform or subscapiform; basal leaves rosulate; stem leaves much reduced ........................................... 7.  S. sect. Rosulascentes

7b. Plants not scapiform; basal leaves not rosulate (often withered at anthesis); stem leaves usually well developed ........................................ 8.  S. sect. Saussurea


木质风毛菊组 mu zhi feng mao ju zu


Three species: Afghanistan, China, N Pakistan, Tajikistan, Uzbekistan; one species in China.


木质风毛菊 mu zhi feng mao ju

Jurinea chondrilloides (C. Winkler) O. Fedtschenko; Saussurea aphylla K. H. Rechinger; S. rupestris Hemsley & Lace.

Subshrubs 60–80 cm tall. Stem green, erect, strongly and repeatedly branched. Leaves elliptic to linear, 1–7.5 × 0.2–0.5(–1) cm, both surfaces green or glaucous, sparsely pubescent, and gland-dotted, margin entire or with few teeth, apex acute. Uppermost stem leaves linear, ca. 10 × 2–3 mm. Capitula numerous, solitary on branch ends in a lax paniculiform synflorescence. Involucre campanulate to obconic, (3–)6–10 mm in diam. Phyllaries in 5–7 rows, arachnoid tomentose and glandular, apex acuminate; outer phyllaries triangular-ovate, 2–3 × 1–1.5 mm; middle phyllaries narrowly elliptic, 3–10 × 1.5–2 mm; inner phyllaries linear, 10–12 × 1–1.5 mm. Receptacle bristles silvery, subulate, 6–8 mm. Corolla pale reddish purple, 1.1–1.6 cm, glandular, tube 5–8 mm, limb 6–8 mm, lobes 2.5–3 mm. Achene brown, cylindrical, 2.5–6 mm, gland-dotted, ribbed, apex with a dentate and lacerate crown. Pappus white or dirty white; outer bristles 1–4–6 mm, barbellate to plumose, sometimes lacking; inner bristles ca. 1 cm. Fl. and fr. Jul–Sep.

Stony slopes; 1800–2800 m. W Xinjiang [Afghanistan, N Pakistan, Tajikistan, Uzbekistan].

No specimens of Saussurea chondrilloides from China were seen by the present authors. The description here is based on the treatment by G M. Shen (Fl. Xinjiang. 5: 275. 1999), on material from Afghanistan, and on an image of the type specimen in LE.


栗缘风毛菊组 li yuan feng mao ju zu

Herbs, perennial. Stem solitary, branched, densely leafy. Capitula numerous or few, solitary at stem and branch ends, supported by uppermost stem leaves. Phyllaries straw-colored, leathery, with brown or black membranous margin. Receptacle paleate; paleae 1–2 cm, approximately as long as inner phyllaries. Anther tails short, undivided. Achene ribbed, glabrous. Pappus bristles in 1 row, plumose, persistent.

Three species: Afghanistan, Bhutan, China, NE and NW India, Kashmir, N Myanmar, Nepal, N Pakistan, Tajikistan; one species in China.

The species of Saussurea sect. Jacea, including its only Chinese representative, almost certainly do not belong in Saussurea. In a cladogram from a recent molecular analysis (Y. J. Wang et al., Biol. J. Linn. Soc. 97: 893–903. 2009), S. fastuosa (= S. fastuosa) was positioned far from the Saussurea clade. The affinities of S. fastuosa could not be further elucidated, however, and it is treated here under Saussurea.


奇形风毛菊 qi xing feng mao ju

Aplotaxis fastuosa Decaisne in Jacquemont, Voy. Inde 4(Bot.): 97. 1843; A. denticulata Candolle; A. denticulata var. glabrata Candolle; A. denticulata var. hypoleuca Candolle; Saussurea denticulata (Candolle) Wallich ex C. B. Clarke (1876), not Ledebour (1829); S. forrestii Diels; S. glabrata (Candolle) C. Shih; S. wallichii Schultz Bipontinus.

Herbs 0.6–1.5 m tall, perennial. Stem solitary, erect, simple or apically branched. Basal and lower stem leaves withered at anthesis. Middle stem leaves petiolate; petiole ca. 5 mm; leaf blade narrowly ovate-elliptic, 6–15 × 2–4.5 cm, abaxially grayish white and densely tomentose or sometimes glabrescent, adaxially green and glabrous, base rounded to broadly cuneate, margin serrulate, apex acute to acuminate. Upper stem leaves gradually smaller upward on stem. Capitula solitary at end of stem or branches, in a lax corymbiform synflorescence, large, on a ± widened peduncle. Involucre campanulate, 1.5–2.5 cm in diam. Phyllaries in 4 or 5 rows, straw-colored, margin membranous, brown, and erose-lacerate, apex rounded; outer phyllaries ovate, 4–8 × 4–5 mm; middle phyllaries elliptic to narrowly elliptic, 7–13 × 2–4 mm; inner phyllaries narrowly elliptic to linear, 13–15 × 1.5–2 mm. Receptacle with paleae but without alveolate bristles; paleae 1.2–1.7 cm. Corolla purple, 1.3–1.4 cm, glabrous, tube 6–8 mm, limb 5–7 mm, lobes 2.5–3

Forests, forest or thicket margins, grasslands, moist meadows; 2400–4000 m. SW Sichuan, S Xizang, NW Yunnan [Bhutan, NE and NW India, N Myanmar, Nepal].

This taxon is very variable with respect to the indumentum of the abaxial leaf surface, which ranges from grayish white and densely tomentose to green and glabrous, and to the shape of the peduncles, which are ± inflated below the capitulum. *Saussurea forestii*, which has less dense indumentum and barely inflated peduncles, was described from material from Yunnan and accepted by S. W. Liu (Fl. Yunnan. 13: 550. 2004); and *S. glabrata* with glabrous leaves was recognized by C. Shih (FRPS 78(2): 84. 1999). However, as no discontinuous characters could be found that would justify separation of these taxa at species level, a broad species concept is adopted here. While the rank of variety might be appropriate, we refrain from validating a name at this rank, as long as the generic affiliation of this species is not yet clear.


无茎风毛菊组 无茎风毛菊属

Herbs, stemless or substemless but sometimes with branched woody caudex and densely caespitose or forming dense cushions. Leaf blade margin entire, serrate, dentate, or sinuate. Capitula usually solitary in center of leaf rosette, large or medium-sized, sometimes several in a clustered synflorescence, sessile or shortly pedunculate. Receptacle with subulate, sometimes very short bristles or naked. Corolla glabrous or sometimes gland-dotted. Anther tails lacerate or lanate. Achene glabrous or glandular, without an apical crown but sometimes with a crenulum rim. Pappus usually in 2 rows; outer bristles scabrid or plumose, rarely very few or lacking.

Twenty species: Bhutan, China, NE and NW India, Japan, Kashmir, Nepal, Tajikistan; 17 species (13 endemic) in China.

*S. glabrata* sect. *Acaules* C. B. Clarke (Compos. Ind. 220. 1876) was lectotypified by Kitamura (Acta Phytotax. Geobot. 24: 22. 1969) with *S. stoliczkae* (= *S. andryaloides*), a species now included in *S. sect. Stricteae*. Lipschitz (Rod Saussurea, 106. 1979) explicitly excluded this lectotype from his *S. sect. Acaules* and thereby created an illegitimate later homonym (Vienna Code, Art. 48.1). The lectotype of *S. sect. Depressae* C. B. Clarke (loc. cit.: 221; chosen by Lipschitz, loc. cit.: 96–97) is *S. andersonii*, now also included in *S. sect. Stricteae*. *Saussurea sect. Depressae* has often been regarded as highly artificial (Lipschitz, loc. cit.: 97). Moreover, its key character is not even very useful for grouping of species. Naked receptacles can be observed in most other sections as well and may only be used for keying out certain groups within a section. For this reason, *S. sect. Depressae* is merged here with *S. sect. Acaules*. The correct name for this section is *S. sect. Gymnocline*, typified by *S. ciliaris*.

1a. Receptacle naked, without bristles; outer phyllaries apically green and reflexed; leaf margin entire; capitulum solitary.

2a. Leaf blade narrowly linear, 1–2 mm wide ................................................................. 77. *S. pochlamys*

2b. Leaf blade narrowly obovate-elliptic to linear, 3–15 mm wide.

3a. Leaf blade adaxially green when dry, glabrous, rigid, and leathery; inner phyllaries acute at apex ............ 78. *S. ciliaris*

3b. Leaf blade adaxially black when dry, puberulent or glabrous, soft, and herbaceous; inner phyllaries obtuse at apex ........................................................................................................ 79. *S. coriolepis*

1b. Receptacle with sometimes very shortly subulate bristles; outer phyllaries apically not green or reflexed; leaf margin entire, dentate, or pinnately lobed; capitula solitary or several.

4a. Leaves long petiolate; petiole 1.5–10 cm; leaf blade elliptic, ovate, or obovate, large (more than 1.5 cm wide), margin coarsely dentate or serrate; capitulum solitary or several.

5a. Outer pappus bristles reflexed and appressed on achene; capitulum 1 (or 2–4); leaf base cuneate, margin sharply dentate or serrate ................................................................. 75. *S. katochaete*

5b. Outer pappus bristles neither reflexed nor appressed on achene; capitulum 4–18 in a corymbiform synflorescence; leaf base cordate, margin shallowly sinuate-dentate ........................................ 76. *S. bella*

4b. Leaves shortly petiolate or sessile; petiole 0.1–2 cm; leaf blade spatulate, narrowly ovate, narrowly elliptic, or linear, small (less than 1.5 cm wide), margin entire, denticulate, sinuate-dentate, or pinnately lobed.

6a. Outer pappus bristles plumose but sometimes very few or lacking; leaf blade spatulate, adaxially villous or tomentose.

7a. Leaf blade adaxially green, sparsely villous, abaxially glaucous but glabrescent ......................... 82. *S. montana*

7b. Leaf blade adaxially grayish green, sparsely tomentose, abaxially grayish white densely tomentose.

8a. Phyllaries sparsely white or yellowish villous, apex usually acuminate; leaf margin entire ....... 80. *S. spatulifolia*

8b. Phyllaries dark brown or black villous, apex usually obtuse; leaf margin sinuate-dentate with short purple mucros ............................................................... 81. *S. melanotricha*

6b. Outer pappus bristles scabrid; leaf blade narrowly elliptic, linear, sometimes narrowly obovate, adaxially glabrous or sparsely pubescent.

9a. Plants forming dense cushions.

10a. Leaf blade pinnately lobed, apex rounded to subobtuse .................................................... 90. *S. pulviniformis*

10b. Leaf blade undivided, apex acuminate or spinulose.
11a. Leaf blade 2–7 cm, abaxially white and tomentose; capitulum 2–3 cm in diam. .......... 88. S. columnaris
11b. Leaf blade 0.5–1.2 cm, abaxially green and glabrous; capitulum 0.5–0.7 cm in diam. ...... 89. S. subulata
9b. Plants not forming dense cushions but sometimes densely caespitose.

12a. Leaf blade green on both surfaces, glabrous or with glandular hairs.
13a. Leaf blade glabrous, margin subentire ................................................................. 86. S. pumila
13b. Leaf blade densely glandular hairy, margin conspicuously sinuate-dentate ........... 87. S. apus
12b. Leaf blade abaxially white and densely tomentose, adaxially green or brown.
14a. Leaf blade margin dentate, crenate, or pinnate; plants densely caespitose .......... 91. S. wernerioides
14b. Leaf blade margin entire or denticulate; plants not caespitose.
15a. Leaf blade ovate to elliptic, 1–3.5 × 0.5–1.5 cm; capitula 2–5 .................................. 83. S. ovatifolia
15b. Leaf blade narrowly obovate to linear, 2.5–7 × 0.2–0.6 cm; capitulum solitary.
16a. Leaf blade spatulate to narrowly obovate, 3–6 mm wide, adaxially arachnoid and glandular ........................................................... 84. S. cochlearifolia
16b. Leaf blade linear to narrowly ovate-elliptic, 2–5 mm wide, adaxially glabrous .......................................................... 85. S. minuta


重齿风毛菊  chong chi feng mao ju

Saussurea anochae Handel-Mazzetti; S. katochaete var. caulescens Lipschitz; S. katochaetoides Handel-Mazzetti; S. rohmoona C. Marquand & Airy Shaw.

Herbs 3–10(–20) cm tall, perennial, stemless or shortly stemmed. Caudex stout, simple or few branched. Rosette leaves petiolate; petiole 1.5–6(–10) cm; leaf blade elliptic, obovate, or ovate, 2.5–11 × 1.5–4.5 cm, abaxially white or grayish white and densely tomentose, adaxially green and glabrous, base cuneate to rounded, margin sharply and narrowly serrate-dentate, apex acuminulate, acute, or obtuse. Capitulum 1(or 2–4), in center of leaf rosette, sessile or pedunculate. Involucre broadly campanulate, 2.5–4 cm in diam. Phyllaries in 4 or 5 rows, brown to black, glabrous, apex acute to acuminulate; outer phyllaries triangular-ovate, 9–15 × 4–6 mm; middle phyllaries ovate to narrowly ovate-elliptic, 12–15 × 4–6 mm; inner phyllaries narrowly elliptic to linear, 1.5–2 × 0.2–0.4 cm. Receptacle bristles yellowish, subulate, 1–3 mm. Corolla purple, 1.3–1.9 cm, tube 7–12 mm, limb 6–8 mm, lobes 4–5 mm. Achene brown, cylindrical, 4–6 mm, obtusely 4- or 5-ribbed. Pappus pale brown; outer bristles 3–5.5 mm, usually reflexed and appressed to achene, scabrid; inner bristles 1.3–1.5 cm, erect. Fl. and fr. Jul.–Oct.

Alpine meadows and pastures, scree slopes, thicket and forest margins; 2200–4800 m. Gansu, Qinghai, W Sichuan, Xizang, NW Yunnan (Dêqên) [Bhutan, India (Sikkim)].


漂亮风毛菊  piao liang feng mao ju


Herbs 3–10 cm tall, perennial, stemless or shortly stemmed. Caudex long, stout, usually simple. Rosette leaves petiolate; petiole 2–7 cm; leaf blade ovate, elliptic, or suborbicular, 2–7 × 1–4.5 cm, abaxially white and densely arachnoid tomentose, adaxially green and arachnoid but glabrescent, base cordate, truncate, or cuneate, margin sinuate-dentate and sometimes proximally pinnately lobed, apex rounded or obtuse to acuminate. Capitula numerous, 4–18, in a clustered corymbiform synflorescence, pedunculate. Involucre campanulate, 1.2–3 cm in diam. Phyllaries in 4 or 5 rows, green and herbaceous in distal part, arachnoid; outer phyllaries narrowly ovate-elliptic to linear, 10–15 × 3–5 mm, apex with a reflexed spiniform mucro; inner phyllaries linear, 1.6–2 × ca. 0.2 cm, yellowish, apex herbaceous and acuminate. Receptacle bristles subulate, ca. 4 mm. Corolla purple, 1.7–2 cm, tube 0.9–1.1 cm, limb 9–10 mm, lobes 5–5.5 mm. Achene gray, 4–5 mm, 4-angled, glabrous. Pappus straw-colored; outer bristles ca. 2 mm, scabrid; inner bristles ca. 1.6 cm. Fl. and fr. Aug.–Sep.

- Alpine pastures, meadows, and scree slopes; 3200–4500 m. Qinghai, E Xizang.


革叶风毛菊  ge ye feng mao ju

Herbs 2–5 cm tall, perennial, stemless or substemless. Caudex simple or few branched. Rosette leaves sessile, linear, 2–12 × 0.1–0.2(–0.4) cm, leathery, both surfaces green, shiny, and glabrous, margin entire and revolute, apex obtuse. Innermost leaves gradually merging into phyllaries. Capitulum solitary in center of leaf rosette, sessile or on a peduncle to 4 cm. Involucre narrowly campanulate, 0.6–1.5 cm in diam. Phyllaries in 4 or 5 rows; outer phyllaries with straw-colored, leathery proximal part and with a green, herbaceous distal part, glabrous, proximal part ovate, 8–10 × 3–5 mm, distal part linear, 1–4 × 0.1–0.2 cm, margin revolute, apex obtuse; middle phyllaries with gradually reduced herbaceous part, narrowly ovate-elliptic, 11–15 × 2–3 mm, glabrescent, apex acute to obtuse; inner phyllaries narrowly elliptic to linear, 15–17 × 1–2 mm, apically purplish, margin membranous, apex obtuse and mucronate or acuminate. Receptacle usually naked, rarely with 1–2 mm yellowish bristles. Corolla bluish purple, 1.6–2.2 cm, tube 0.8–1.5 cm, limb 5–7 mm, lobes 4.5–5.5 mm. Achene brown, cylindrical, 3.5–4 mm, 5-ribbed, glabrous, tuberculate. Pappus dirty white; outer bristles 4–5 mm, plumose; inner bristles 1.2–1.3 cm. Fl. and fr. Aug.–Oct.

- Thickets, alpine meadows and pastures; 3200–4300 m. SW and W Sichuan (Kangding, Muli), NW Yunnan (Lijiang, Zhongdian).
78. Saussurea ciliaris Franchet, J. Bot. (Morot) 2: 337. 1888.

尖叶风毛菊  jian ye feng mao ju

**Saussurea ciliaris** var. major Y. Ling.

Herbs 2.5–6 cm tall, perennial, stemless or shortly stemmed. Caudex short, simple or few branched. Rosette leaves sessile, narrowly obovate-elliptic to linear, 1.5–13 × 0.3–1.2 cm, rigid and leathery, glabrous, abaxially pale green, adaxially green and shiny, base cuneate-attenuate, margin entire, revolute, and ciliate, apex acute. Uppermost leaves gradually merging into phyllaries. Capitulum solitary, in center of leaf rosette, sessile. Involucre campanulate, 1–2 cm in diam. Phyllaries in 3 or 4 rows; outer phyllaries with brown leathery basal part and a green herbaceous reflexed apical part, glabrous, basal part ovate and 7–10 × 3–5 mm, apical part linear-oblong and 0.7–3 × 0.4–1 cm, margin revolute and ciliate, apex obtuse; inner phyllaries narrowly elliptic to linear, 10–15 × 3–5 mm, with a gradually reduced herbaceous apical part, apical purple, apex acuminate. Receptacle without bristles. Corolla purple, 1.5–1.7 cm, sparsely gland-dotted, tube 8–9 mm, limb 4.5–5.5 mm. Achene brown, cylindrical, 1.5–1.6 cm, sparsely gland-dotted, apex obtuse. Receptacle bristles few, triangular-subulate, to 1 mm. Corolla purple, 1.3–1.6 cm, sparsely gland-dotted, tube 7–8 mm, limb 6–8 mm, lobes 5–6 mm. Achene dark brown, cylindrical, 4–4.5 mm, transversely rugose, glabrous or with few sessile glands, apex with a crenulate rim. Pappus dirty white to pale brown; outer bristles very few or sometimes lacking, 2–3 mm, plumose; inner bristles 1.2–1.4 cm. Fl. and fr. Jul.–Oct.

- Alpine meadows and pastures, thickets, scree slopes: 3000–4600 m. SW Sichuan, NW Yunnan.


黑苞风毛菊  hei bao feng mao ju

**Saussurea xanthotricha** Handel-Mazzetti.

Herbs 1.5–5 cm tall, perennial, stemless or substemless, laxly caespitose. Caudex usually branched with several sterile and flowering leaf rosettes. Leaves petiolate; petiole purple, to 1.5 cm; leaf blade elliptic to spatulate-elliptic, 1–3.5 × 0.4–1 cm, abaxially white, densely tomentose, and with a conspicuous midvein, adaxially grayish green and densely villous, base cuneate-attenuate, margin entire or obtusely sinuate-dentate with purple mucronulate teeth, apex rounded to obtuse with a short mucro. Capitulum solitary, in center of leaf rosette. Involucre campanulate, 1–1.5 cm in diam. Phyllaries in 3 or 4 rows, purplish brown and dark brown to blackish villous in distal part, apex acute to obtuse; outer phyllaries, 9–11 × 4–6 mm; middle phyllaries narrowly ovate-elliptic, 12–13 × 3–4 mm; inner phyllaries narrowly elliptic-linear, 12–14 × 2–3 mm. Receptacle bristles few, triangular-subulate, to 1 mm. Corolla purple, 1.2–1.6 cm, sparsely gland-dotted, tube 5–8 mm, limb 6–8 mm, lobes 3.5–4 mm. Achene cylindrical, 3–5 mm, gland-dotted. Pappus pale brown; outer bristles 3–5 mm, plumose; inner bristles 1.2–1.4 cm. Fl. and fr. Sep.

- Alpine scree slopes, open rocky mountain slopes; 3500–4700 m. SW Sichuan, NW Yunnan.

**Saussurea melanotricha** is very close to *S. spatulifolia* and probably not clearly separated at species level. The type specimen of *S. xanthotricha* from Sichuan holds an intermediate position between *S. spatulifolia* and *S. melanotricha*, combining the acuminate phyllaries with yellowish indumentum of the former with the sinuate-dentate leaf margins with purple mucros of the latter.


维西风毛菊  wei xi feng mao ju

**Saussurea ciliaris** var. major Y. Ling.

Herbs 2–4 cm tall, perennial, stemless, sometimes laxly caespitose. Caudex simple or branched with several sterile and flowering leaf rosettes. Leaves petiolate; petiole purple, to 1 cm; leaf blade spatulate to oblong-spataulate, 0.5–3 × 0.5–1 cm, abaxially white and densely tomentose, adaxially grayish green and tomentose, base cuneate, margin entire, apex rounded and with a small mucro. Capitulum solitary, in center of leaf rosette. Involucre campanulate, 1–1.5 cm in diam. Phyllaries in ca. 4 rows, pale brown to blackish purple, sparsely white or yellowish villous, apex acute to acuminate; outer phyllaries ovate, 8–10 × 4–5 mm; middle phyllaries narrowly ovate-elliptic, 10–12 × 3–4 mm; inner phyllaries narrowly elliptic to linear, 12–14 × 2–3 mm. Receptacle bristles brownish, subulate, 0.5–1.5 mm. Corolla purple, 1.3–1.6 cm, sparsely gland-dotted, tube 7–8 mm, limb 6–8 mm, lobes 5–6 mm. Achene dark brown, cylindrical, obconic, 4–4.5 mm, transversely rugose, glabrous or with few sessile glands, apex with a crenulate rim. Pappus dirty white to pale brown; outer bristles very few or sometimes lacking, 2–3 mm, plumose; inner bristles 1.2–1.4 cm. Fl. and fr. Jul.–Oct.

- Alpine meadows and pastures, scree slopes; 3000–4600 m. SW Sichuan, NW Yunnan.

- Alpine meadows and pastures, thickets, scree slopes: 2600–4400 m. W Sichuan, NW Yunnan (Eryuan, Lijiang, Zhongdian).


维西风毛菊  wei xi feng mao ju

**Saussurea ciliaris** var. major Y. Ling.

Herbs 2–3 cm tall, perennial, stemless, sometimes laxly caespitose. Caudex simple or branched with several sterile and flowering leaf rosettes. Leaves petiolate; petiole purple, to 1 cm; leaf blade spatulate to oblong-spataulate, 0.5–3 × 0.5–1 cm, abaxially white and densely tomentose, adaxially grayish green and tomentose, base cuneate, margin entire, apex rounded and with a small mucro. Capitulum solitary, in center of leaf rosette. Involucre campanulate, 1–1.5 cm in diam. Phyllaries in ca. 4 rows, pale brown to blackish purple, sparsely white or yellowish villous, apex acute to acuminate; outer phyllaries ovate, 8–10 × 4–5 mm; middle phyllaries narrowly ovate-elliptic, 10–12 × 3–4 mm; inner phyllaries narrowly elliptic to linear, 12–14 × 2–3 mm. Receptacle bristles brownish, subulate, 0.5–1.5 mm. Corolla purple, 1.3–1.6 cm, sparsely gland-dotted, tube 7–8 mm, limb 6–8 mm, lobes 5–6 mm. Achene dark brown, cylindrical, obconic, 4–4.5 mm, transversely rugose, glabrous or with few sessile glands, apex with a crenulate rim. Pappus dirty white to pale brown; outer bristles very few or sometimes lacking, 2–3 mm, plumose; inner bristles 1.2–1.4 cm. Fl. and fr. Jul.–Oct.

- Alpine meadows and pastures, scree slopes; 3000–4600 m. SW Sichuan, NW Yunnan.
flowering leaf rosettes. Leaves petiolate; petiole purple, to 5 mm; leaf blade narrowly obovate or narrowly elliptic, 1–3 × 0.4–1 cm, abaxially glaucous and sparsely villous but glabrescent, adaxially green and villous, base cuneate-attenuate, margin entire, apex obtuse to rounded and with a short mucro. Capitulum solitary, in center of rosette, sessile. Involucre campanulate, 0.8–1.2 cm in diam. Phyllaries in ca. 4 rows, purple and yellowish to brownish villous in distal part, apex usually obtuse; outer phyllaries ovate, 6–7 × 3–4 mm; middle phyllaries narrowly ovate-elliptic, 7–11 × 2–3 mm, apex acute to obtuse; inner phyllaries narrowly elliptic to linear, 11–15 × 1.5–3 mm, apex acute. Receptacle bristles subulate, ca. 1.5 mm. Corolla purple, 1.6–1.7 cm, gland-dotted, tube 7–10 mm, limb 6–10 mm, lobes 5–6 mm. Achene ca. 1.5 mm. Transversely rugose. Pappus brown; outer bristles 2–3 mm, scabrid; inner bristles ca. 1 mm. Fl. and fr. Aug.–Sep.

- Alpine pastures; 3600–4600 m. SW Sichuan (Muli), NW Yunnan (Lijiang).

Like *Saussurea melanotricha*, *S. montana* is also very close to *S. spathulifolia* and probably not clearly separated at species level. However, the indumentum is clearly very different, and no transient forms have been observed.


青藏风毛菊  qìng zāng fēng máo ju

Herbs 2–6 cm tall, perennial, stemless or shortly stemmed. Caudex elongate, 2–3 mm in diam., simple or few branched, covered with brown remains of petioles. Rosette leaves petiolate; petiole 3–10 mm; leaf blade ovate to elliptic, 1–3.5 × 0.5–1.5 cm, abaxially white and densely tomentose, adaxially grayish green and sparsely arachnoid, base rounded to cuneate, margin sparsely denticulate or entire, apex acute, acuminate, or obtuse. Capitula (1 or)2–5, in a hemispherically condensed corymbiform synflorescence or rarely solitary, subseisso. Involucre campanulate, 6–10 mm in diam. Phyllaries in 3–5 rows, brownish or greenish yellow, villous, apex acute to acuminate; outer phyllaries narrowly ovate, 4–6 × 2–3 mm; middle phyllaries narrowly ovate-elliptic, 5–8 × 1.5–2 mm; inner phyllaries linear, 8–10 × 1–1.5 mm. Receptacle bristles 1–2 mm. Corolla purplish red, 1.2–1.5 cm, tube 4–6 mm, limb 5–5.5 mm, lobes ca. 3 mm. Achene 3–4 mm, glabrous. Pappus basally pale brown, apically dirty white; outer bristles scabrid. Fl. and fr. Aug.–Sep.

- Alpine meadows, riverbanks; 4200–5200 m. Qinghai, Xizang.

*Saussurea ovatifolia* may be very closely related to the geographically distant *S. elliptica*, known from the Karakorum range and attributed to *S. sect. Saussurea*. Records of *S. ovata* in the sense of *S. W. Liu (Fl. Qinghai, 3: 469. 1996) are probably referable to *S. ovatifolia*.


匙叶风毛菊  shì yě fēng máo ju

Herbs ca. 2 cm tall, perennial, stemless. Caudex stout, few branched. Rosette leaves petiolate; petiole 1–1.5 cm; leaf blade spatulate to narrowly obovate-oblung, 2.5–4 × 0.3–0.6 cm, abaxially grayish green and densely tomentose, adaxially green, glandular hairy, and sparsely arachnoid, base attenuate, margin entire, apex acute. Capitulum solitary, in center of leaf rosette, sessile. Involucre narrowly campanulate, 0.8–1.2 cm in diam. Phyllaries in 3 or 4 rows, margin and distally purplish black, sparsely arachnoid, apex acuminate; outer phyllaries narrowly triangular-ovate, 5–8 × 2–3 mm; middle phyllaries narrowly ovate-elliptic, 8–12 × 1–2 mm; inner phyllaries linear, 12–14 × 1 cm. Receptacle not seen. Corolla purple, 1.5–1.6 cm, tube 7–8 mm, limb 7–8 mm, lobes ca. 5 mm. Achene ca. 1.5 mm. Transversely rugose. Pappus pale brown; outer bristles 2–3 mm, scabrid; inner bristles ca. 1 mm. Fl. and fr. Aug.–Sep.

- Moraines, alpine meadows; ca. 4000 m. S Xizang (Yadong) [India (Sikkim)].

*Saussurea cochlearifolia* may occur in India (Sikkim) (see Grierson & Springate, Fl. Bhutan 2(3): 1441. 2001).


小风毛菊  xiǎo fēng máo ju

*Saussurea lancifolia* Handel-Mazzetti.

Herbs 2.5–7 cm tall, perennial, stemless or shortly stemmed. Caudex 2–3 mm in diam., creeping, usually few branched, with several sterile and flowering leaf rosettes. Rosette leaves petiolate; leaf blade narrowly elliptic to linear, 3–7 × 0.2–0.5 cm, abaxially white and densely tomentose, adaxially green and glabrous, base attenuate, margin revolute and entire, apex acute. Stem leaves (if present) similar to rosette leaves but gradually shorter upward on stem; uppermost leaves sessile, subtending and overtopping capitulum. Capitulum solitary, in center of leaf rosette or terminal on a short stem. Involucre narrowly campanulate, 0.8–1.2 cm in diam. Phyllaries in 3 or 4 rows, purple; outer phyllaries triangular-ovate, 9–11 × 3–5 mm, glabrous, apex acute; middle phyllaries ovate, 12–14 × 3–4 mm, glabrous, apex acute; inner phyllaries narrowly ovate-linear, 14–16 × 2–3 mm, apically densely villous, apex obtuse. Receptacle bristles subulate-filiform, 7–8 mm. Corolla purple, 1.2–1.4 cm, tube 5–6 mm, limb 6–7 mm, lobes 3–4 mm. Achene only seen as immature. Pappus dirty white; outer bristles ca. 2 mm, scabrid; inner bristles 1–1.1 cm. Fl. and fr. Jul.–Sep.

- Alpine scree slopes; 3500–4900 m. Gansu, Qinghai, W Sichuan.


矮小风毛菊  ái xiǎo fēng máo ju

Herbs 2–4(–8) cm tall, perennial, stemless or shortly stemmed. Caudex 1–3 mm in diam., simple or few branched. Rosette leaves shortly petiolate; leaf blade narrowly ovate-elliptic, narrowly spatulate, or linear-elliptic, 0.8–3(–5) × 0.2–0.7(–1) cm, both surfaces green and glabrous, base cuneate-attenuate, margin subentire to minutely denticulate-serrulate, apex acute to obtuse and mucronate. Stem leaves (if present) similar to rosette leaves. Capitulum 1–3, in center of leaf rosette or terminal on stem. Involucre campanulate, 1–1.5 cm in diam. Phyllaries in 4 or 5 rows, blackish brown or straw-
colored with dark midvein and margin, sometimes tinged purple, glabrous or sparsely villous, apex acute to acuminate; outer phyllaries narrowly ovate-triangular, 7–11 × 3–5 mm; middle phyllaries narrowly ovate-elliptic, 8–13 × 2–3 mm; inner phyllaries narrowly elliptic-linear, 13–15 × ca. 2 mm. Receptacle bristles 3–5 mm. Corolla purple, 1–1.3 cm, tube 5–7 mm, limb 5–6 mm, lobes 3–3.5 mm. Achene brown, cylindrical, ca. 3 mm, glabrous. Pappus straw-colored; outer bristles 1–3 mm, scabrid; inner bristles 1–1.1 cm. Fl. and fr. Jul–Sep. 2n = 30* (as *Saussurea apus* but see discussion below).

- Alpine meadows, in turf; 3600–4700 m. Qinghai, Sichuan, Xizang.

*Saussurea pumila* has often been confused with *S. apus*. The two taxa are probably closely related. *Saussurea apus* differs from *S. pumila* by the usually larger size and always densely glandular, distinctly dentate leaves.


无梗风毛菊 wu geng feng mao ju

*Saussurea humilis* Ostenfeld; *S. koslowii* C. Winkler.

Herbs 2–6(–10) cm tall, perennial, caespitose, shortly stemmed. Caudex branched, with many sterile and flowering leaf rosettes. Rosette leaves shortly petiolate; leaf blade narrowly elliptic to linear, 2–7 × 0.2–1.5 cm, both surfaces green and densely glandular hairy, abaxially with a prominent straw-colored midvein, base cuneate-attenuate, margin sharply sinuate-dentate, apex acuminate. Stem leaves (if present) similar to colored midvein, base cuneate-attenuate, margin sharply sinuate-dentate, apex acuminate. Uppermost leaves sometimes tinged purple, uppermost stem leaves sometimes tinged purple, subterminal capitulum. Capitulum solitary, in center of leaf rosette or terminal on stem, sessile. Involucre campanulate, 1.2–2(–3) mm in diam. Phyllaries in 3–5 rows, blackish purple, villous but glabrescent, apex acute to acuminate; outer phyllaries narrowly ovate, 7–12 × 3–4 mm; middle phyllaries narrowly elliptic, 10–14 × 2–3 mm; inner phyllaries narrowly elliptic-linear, 13–15 × 1–2 mm. Receptacle bristles 1.5–3 mm. Corolla purple, 1.2–1.5 cm, tube 6–8 mm, limb 5–7 mm, lobes 3.5–4.5 mm. Achene cylindrical, 2.3–3.5 mm, glabrous. Pappus dirty white; outer bristles 1–2(–3) mm, scabrid; inner bristles 0.9–1.1(–1.3) cm. Fl. and fr. Jul–Sep.

- Alpine steppes and pastures; 4000–5400 m. Gansu, Qinghai, Xizang.

Some populations of this taxon have purplish leaves subtending the capitulum, thereby showing similarity and possible relationship with *S. bracteata* from SW Xizang, a member of *S. subg. Amphilaena*.


柱茎风毛菊 zu jing feng mao ju

Herbs 4–10 cm tall, perennial, stemless or shortly stemmed. Caudex 1–1.5 cm in diam., usually much branched, with many sterile and flowering leaf rosettes forming large cushions, densely covered with persistent withered leaves. Rosette leaves sessile, linear, 2–7 × 0.1–0.2(–0.3) cm, abaxially grayish white and densely tomentose-sericeous, adaxially green to dark brown, shiny, and glabrous, base enlarged, sheathing, and white villous, margin entire and revolute, apex acute. Uppermost leaves merging into phyllaries. Capitulum solitary, in center of leaf rosette or terminal on stem, sessile. Involucrre campanulate, 2–3 cm in diam. Phyllaries in ca. 5 rows, apex acuminate to caudate; outer phyllaries narrowly ovate-elliptic-linear, 10–16 × 3–4 mm, basal part blackish purple, apical part greenish or brown, shiny, glabrous, and reflexed; middle and inner phyllaries narrowly ovate-triangular to narrowly elliptic-linear, 11–15 × 2–4 mm, basal part pale yellow, apical part blackish purple, villous, and erect. Receptacle bristles 7–8 mm. Corolla purplish red, 1.3–1.5 cm, tube 7–8 mm, limb 6–7 mm, lobes 3.5–4 mm. Achene dark brown, conic, ca. 3 mm, glabrous. Pappus in 2 rows; outer bristles white, 2–4 mm, scabrid; inner bristles pale brown, 9–10 mm. Fl. and fr. Aug–Oct.

- Alpine meadows, rocky mountain slopes; 3000–4700 m. SW Sichuan, SE Xizang (Zayü), NW Yunnan [Bhutan].

The record of *Saussurea columnaris* in Bhutan (see Grierson & Springate, Fl. Bhutan 2(3): 1441. 2001) is now confirmed by more recent collections.

89. *Saussurea subulata* C. B. Clarke, Compos. Ind. 226. 1876.

钻叶风毛菊 zuan ye feng mao ju

*Saussurea setifolia* Klatt.

Herbs 1.5–10 cm tall, perennial, caespitose. Caudex much branched, with numerous sterile and flowering leaf rosettes forming dense cushions. Leaves sessile; leaf sheath purple, 1–1.2 cm, apically densely villous at margin; leaf blade subulate-linear, 5–12 × 0.5–1 mm, leathery, both surfaces green and glabrous, margin revolute and entire, apex with a white cartilaginous mucro to 1 mm. Uppermost leaves merging into phyllaries. Capitulum solitary, in center of leaf rosettes, very shortly pedunculate. Involucrre campanulate, 5–7 mm in diam. Phyllaries in ca. 4 rows, glabrous, apex acuminate; outer phyllaries ovate, 10–14 × 3–5 mm, basal part brownish or purple, apical part green, leaflike, and subulate, apex with a white cartilaginous mucro; middle phyllaries narrowly ovate-elliptic, 6–9 × 2–3 mm, basal part pale yellow, apical part purple; inner phyllaries narrowly elliptic to linear, 6–9 × 1–2 mm. Receptacle bristles brown, to 1 mm. Corolla purplish red, 1–1.2 cm, tube 5–6 mm, limb 4–5 mm, lobes 2.5–3 mm. Achene cylindrical, 1.5–3.5 mm, smooth, glabrous. Pappus brown; outer bristles 2–3 mm, scabrid; inner bristles 7–8(–12) mm. Fl. and fr. Jul–Sep.

- Gravelly and moist places near rivers, alpine grasslands and meadows, saline or alkaline sandy soils; 4100–5300 m. Gansu, Qinghai, Xinjiang, Xizang [NW India, Kashmir].

The erroneous record of *Saussurea subulata* from Yunnan by H. Léveillé (Cat. Pl. Yun-Nan, 50. 1916) must be referable to *S. wernerioides*. Although S. W. Liu (Fl. Yunnan. 13: 543–544. 2004) listed *S. subulata* for this province as well, he mentioned that he did not see any specimens from there. Consequently, this species should be excluded from the flora of Yunnan.


热状风毛菊 dian zhuang feng mao ju
Herbs to 3.5 cm tall, perennial, caespitose. Caudex thick, much branched, with many sterile and flowering leaf rosettes forming dense cushions, with fibrously split bark, densely covered with remains of leaves. Rosette leaves petiolate; petiole sheathing at base; leaf blade narrowly elliptic to obovate in outline, 1.5–2.5 × 0.3–0.8 cm, pinnately lobed, both surfaces green and glabrous; lateral lobes 3–6, ovate-elliptic to sub-bulbar, margin entire or obtusely dentate, apex obtuse; terminal lobe orbicular or oblong-elliptic, larger than lateral ones, apex obtuse to rounded. Capitula solitary, sessile. Involucre campanulate, 5–8 mm in diam. Phyllaries in 5 or 6 rows, straw-colored, glabrous; outer phyllaries ovate, apex subobtuse; inner phyllaries narrowly ovate-elliptic, apex subobtuse or with a short cusp. Receptacle with short bristles. Corolla pale to deep red, laries narrowly ovate-elliptic, apex subobtuse or with a short glabrous; outer phyllaries ovate, apex subobtuse; inner phyllaries narrowly ovate-elliptic, apex subobtuse or with a short cusp. Receptacle with short bristles. Corolla pale to deep red, laries narrowly ovate-elliptic, apex subobtuse or with a short

## 91. Saussurea wernerioides

- Alpine grasslands and stony slopes; 2100–3500 m. NW Xinjiang (Tian Shan).

### 9. Saussurea wernerioides

*Saussurea wernerioides* (Asteraceae) is a species of flowering plant in the family Asteraceae. It is found in the Alpine regions of Xinjiang, China, growing in alpine grasslands and stony slopes at altitudes of 2100–3500 meters. It is a perennial herb, forming dense cushions with fibrously split bark. The leaves are petiolate, with petioles sheathing the base of the leaves. The leaf blades are narrowly elliptic to obovate, with a short cusp at the apex. The capitula are solitary, sessile, and surrounded by a campanulate involucre. The corolla is typically red, with laries narrowly ovate-elliptic, apex subobtuse. The achene is brown, obconic, to 5 mm, 4-angled, glabrous. The pappus is 1.2–1.4 cm, tube 5–7 mm, limb 6–7 mm, lobes to 4 mm.

**Key to Saussurea Species**

1a. Leaf blade thick, fleshy; plants usually on saline or alkaline soils.

1b. Flowering stems procumbent to ascending; receptacle usually naked

2a. Flowering stems procumbent to ascending; receptacle usually naked

2b. Flowering stems erect; receptacle with bristles.

3a. Leaf blade bipinnately divided or pinnatisect, secondary segments linear.

3b. Leaf blade pinnately divided, pinnately lobed, lyrate-pinnately lobed, or undivided with a sinuate-dentate margin.

4a. Leaf blade glabrous or hispidulous; capitula 6–10 mm in diam.; outer phyllaries glabrous, apex acuminate

4b. Leaf blade strigose or arachnoid; capitula 4–5 mm in diam.; outer phyllaries pubescent, apex subobtuse

5a. Plants grayish green; achene with a short crown.

5b. Plants green; achene without a crown.

6a. Capitula numerous, in a densely congested corymbose hemispheric synflorescence; stem 4–20(–30) cm tall; leaves to 3 cm wide

6b. Capitula solitary or few on branch ends; stem 15–50 cm tall; leaves 0.4–1.5 cm wide.

7a. Leaf blade ovate, rhombic, obovate, or elliptic

7b. Leaf blade linear or narrowly elliptic

8a. Lower stem leaves pinnately cleft or pinnately divided; outer pappus bristles persistent

8b. Lower stem leaves lyrate-pinnately lobed or lyrate-pinnately divided; outer pappus bristles caducous.

**Sixty-four species: C, E, and SW Asia, E Europe; 49 species (30 endemic) in China.**


### 4. Saussurea sect. Laguranthera


Perennial herbs or subshrubs, sometimes densely caespitose, with well-developed stems. Rootstock or caudex distinctly fibrous or with woody bark split in fibers. Stems solitary or several, erect or sometimes procumbent or ascending, usually branched, leafy. Leaves fleshy or herbaceous, undivided to pinnatisect. Capitula usually numerous, rarely solitary or few, solitary or in a corymbose or paniculiform synflorescence, narrowly campanulate, tubular, or cylindric, usually not more than 1 cm in diam. Phyllaries imbricate, appressed, margin entire, without an apical appendage, apex acute to obtuse and sometimes with a mucro or an erect or reflexed cusp. Receptacle usually with filiform or subulate bristles, rarely without bristles. Corolla glabrous or minutely gland-dotted. Anther tails lanate. Achene glabrous or rarely gland-dotted, with or without a short apical crown. Pappus always in 2 rows; outer bristles usually scabrid; inner bristles plumose.

**Sixty-four species: C, E, and SW Asia, E Europe; 49 species (30 endemic) in China.**

1a. Leaf blade thick, fleshy; plants usually on saline or alkaline soils.

2a. Flowering stems procumbent to ascending; receptacle usually naked

2b. Flowering stems erect; receptacle with bristles.

3a. Leaf blade bipinnately divided or pinnatisect, secondary segments linear.

3b. Leaf blade pinnately divided, pinnately lobed, lyrate-pinnately lobed, or undivided with a sinuate-dentate margin.

4a. Leaf blade glabrous or hispidulous; capitula 6–10 mm in diam.; outer phyllaries glabrous, apex acuminate

4b. Leaf blade strigose or arachnoid; capitula 4–5 mm in diam.; outer phyllaries pubescent, apex subobtuse

5a. Plants grayish green; achene with a short crown.

5b. Plants green; achene without a crown.

6a. Capitula numerous, in a densely congested corymbose hemispheric synflorescence; stem 4–20(–30) cm tall; leaves to 3 cm wide

6b. Capitula solitary or few on branch ends; stem 15–50 cm tall; leaves 0.4–1.5 cm wide.

7a. Leaf blade ovate, rhombic, obovate, or elliptic

7b. Leaf blade linear or narrowly elliptic

8a. Lower stem leaves pinnately cleft or pinnately divided; outer pappus bristles persistent

8b. Lower stem leaves lyrate-pinnately lobed or lyrate-pinnately divided; outer pappus bristles caducous.


Herbs 1–3 cm tall, perennial, caespitose, stemless. Caudex stout, fibrous, much branched, with many sterile and flowering leaf rosettes. Rosette leaves petiolate; petiole to 4 mm; leaf blade narrowly obovate or elliptic, 8–15 × 1–4 mm, abaxially grayish white and densely tomentose, adaxially green and glabrous, base cuneate-attenuate, margin with 2 or 3 acute lobes or teeth, apex acuminate. Uppermost leaves merging into phyllaries. Capitula solitary, in center of leaf rosettes, sessile. Involucre campanulate, 0.8–1.5 cm in diam. Phyllaries in 3 or 4 rows, apex acuminate; outer phyllaries narrowly triangular-ovate, 7–15 × 2–5 mm, basal part brownish or purple, glabrous, apical part leaflike and tomentose; middle phyllaries narrowly ovate-elliptic, 6–10 × 1.5–3 mm, purplish brown, apically arachnoid; inner phyllaries linear, 8–10 × 1–1.5 mm, glabrous, apically purple. Receptacle bristles light brown, 1–3 mm. Corolla purplish red, 9–10(–16) mm, tube 4–5(–8) mm, limb 4.5–5(–8) mm, lobes 3–3.5 mm. Achene pale brown, cylindric, 2–3 mm, glabrous. Pappus pale brown; outer bristles 3–5 mm, scabrid; inner bristles 6–7–(10) mm. Fl. and fr. Aug.–Oct. 2n = 32.

Alpine pastures, meadows, and scree slopes; 4200–5400 m. W Sichuan, S Xizang, NW Yunnan (Dêqên) [Bhutan, India (Sikkim), Nepal].
9a. Terminal lobe of leaf blade large, triangular, sagittate, or hastate .................................................... 98. *S. salsa*
9b. Terminal lobe of leaf blade smaller, narrowly ovate to elliptic .................................................... 100. *S. maximowiczii*

1b. Leaf blade thin, not fleshy; plants not on saline or alkaline soils.
10a. Leaf sheath and base of petiole adaxially densely white lanate .................................................... 101. *S. pulvinata*
10b. Leaf sheath and base of petiole adaxially glabrous.

11a. Achene transversely rugose; capitula large, broadly obconic, 1–2 cm in diam.; corolla more than 1.8 cm ................................................................................................................................. 102. *S. pulchra*
11b. Achene not transversely rugose; capitula smaller, cylindric to narrowly campanulate, usually less than 1 cm in diam.; corolla usually less than 1.5 cm.

12a. Phyllaries with apex acuminate and with a long conspicuous mucro.
13a. Leaf blade green and glabrous on both surfaces; capitula pendent ........................................ 105. *S. alberti*
13b. Leaf blade abaxially grayish green, arachnoid or tomentose; capitula erect.

14a. Leaf blade narrowly ovate or narrowly ovate-oblong, pinnately lobed, or undivided and margin sinuate-dentate ................................................................. 106. *S. larionowii*
14b. Leaf blade linear, undivided, margin entire ........................................................ 107. *S. mucronulata*

12b. Phyllaries with apex obtuse, acute, or shortly acuminate or with a short mucro.
15a. Perennial herbs, densely or laxly caespitose, or subshrubs; caudex or rootstock woody, branched; stems several to many.
16a. Leaf blade pinnately lobed, pinnatisect, or bipinnatisect.
17a. Leaf blade clearly bipinnatisect; segments 11–13 pairs .................. 119. *S. deserticola*
17b. Leaf blade pinnatisect or pinnately lobed; segments 2–5 pairs.

18a. Leaf blade segments subulate, linear, or narrowly triangular.
19a. Leaf blade of lower stem leaves sparsely gland-dotted on both surfaces otherwise glabrous; leaf blade segments 2 or 3 pairs, subulate; phyllaries in 7 or 8 rows ................................................................. 117. *S. yabulaiensis*
19b. Leaf blade of lower stem leaves sparsely arachnoid and glandular on both surfaces; leaf blade segments 3–5 pairs, linear or narrowly triangular; phyllaries in 5 or 6 rows ............... 118. *S. mae*

18b. Leaf blade segments ovate, elliptic, or triangular-ovate.
20a. Involucre cylindric, 4–5 mm in diam. ........................................ 110. *S. kanzanensis*
20b. Involucre campanulate, 7–10 mm in diam.

21a. Leaf blade elliptic, pinnately lobed to pinnatisect .................... 109. *S. blanda*
21b. Leaf blade obovate, pinnately dentate to lyrate-pinnately lobed .................. 115. *S. salmannii*

23a. Leaf blade grayish white and tomentose on both surfaces.
24a. Leaf margin entire ........................................................................ 112. *S. cana*
24b. Leaf margin sinuate-dentate ......................................................... 114. *S. canescens*
23b. Leaf blade abaxially green and subglabrous or grayish white tomentose, adaxially green and subglabrous.
25a. Leaf blade linear or narrowly linear, 5 mm wide or less.
26a. Leaf blade narrowly linear, 1–4 mm wide, margin dentate .... 113. *S. petrovii*
26b. Leaf blade linear, 2–5 mm wide, margin entire .............. 120. *S. salicifolia*
25b. Leaf blade narrowly elliptic, narrowly ovate, or oblong, more than 10 mm wide.
27a. Phyllaries not with a dark margin, apex acuminate and shortly mucronate; leaf blade abaxially pale or grayish green and glabrous or pubescent ......................................................... 108. *S. coronata*
27b. Phyllaries with a narrow dark margin, apex obtuse to rounded; leaf blade abaxially grayish white and densely arachnoid tomentose ......................................................... 121. *S. lomatolepis*

15b. Perennial herbs, not caespitose, without a woody caudex or rootstock, rhizomatous; stem solitary.
28a. Leaf blade green, concolorous or abaxially paler green, abaxially sparsely strigose or glabrous.
29a. Leaf blade pinnately dentate to pinnatisect.
30a. Leaf blade pinnately lobed or pinnately dentate ............................. 135. *S. tianshuiensis*
30b. Leaf blade pinnatisect.
   31a. Involucre tubular, 5–8 mm in diam. .............................................  133. S. acroura
   31b. Involucre campanulate to globose, 10–15 mm in diam. ............  134. S. megaphylla

29b. Leaf blade undivided.
   32a. Plants shortly stemmed, at most ca. 0.2 m tall ............................ 103. S. ovata
   32b. Plants with tall stems, 0.3–2 m tall.
      33a. Plants 1–2 m tall; stem ca. 1 cm in diam. at base ....................... 111. S. elata
      33b. Plants to 1.4 m tall; stem less than 1 cm in diam. at base.
         34a. Middle stem leaves triangular-ovate with a truncate base; phyllaries arachnoid lanate, apex reflexed and herbaceous ............................................. 127. S. sutchuenensis
         34b. Middle stem leaves elliptic or narrowly elliptic; phyllaries glabrous, sparsely arachnoid, or only apically bearded and surface scarious, apex erect and not herbaceous.
            35a. Leaves sessile; leaf blade narrowly ovate-elliptic to narrowly elliptic, 1–2 cm wide ......................... 124. S. zhuxiensis
            35b. Leaves petiolate; leaf blade elliptic, 3–7 cm wide.
               36a. Capitula in a diffuse corymbiform-panciculiform synflorescence, long pedunculate ................................................... 128. S. dolichopoda
               36b. Capitula clustered at end of branches, in congested corymbiform synflorescence, shortly pedunculate ........................................ 129. S. saligna

28b. Leaf blade abaxially grayish white or grayish green and densely tomentose, arachnoid, or pubescent, adaxially green.

37a. Leaf blade pinnately lobed, pinnatisect, or lyrate.
   38a. Leaf blade lyrate-pinnatisect; plants less than 15 cm tall ............. 140. S. bartholomewii
   38b. Leaf blade not lyrate-pinnatisect; plants more than 15 cm tall.
      39a. Stem and petioles winged ........................................................ 136. S. pteridophylla
      39b. Stem and petioles unwinged.
         40a. Stem usually with short sterile axillary shoots .......................... 132. S. elegans
         40b. Stem without short sterile axillary shoots.
            41a. Leaf blade bipinnately divided ............................................ 139. S. chrysanthemoides
            41b. Leaf blade pinnately lobed to pinnatisect.
               42a. Middle stem leaves with 2 or 3 pairs of lobes, abaxially white and densely tomentose; involucre obconic, 6–8 mm in diam. ..................... 137. S. compta
               42b. Middle stem leaves with 4–14 pairs of lobes, abaxially grayish green and thinly arachnoid; involucre tubular, ca. 5 mm in diam. .................. 138. S. variiloba

37b. Leaf blade undivided and margin entire or dentate.
   43a. Leaf blade ovate, ovate-elliptic, elliptic, or oblong, more than 3 cm wide.
      44a. Leaves shortly petiolate (to 1 cm); leaf blade broadly ovate, margin sharply serrate; synflorescence supported by uppermost stem leaves .............................................................. 104. S. licentiana
      44b. Leaves long petiolate (2.5–5 cm); leaf blade ovate, elliptic, or narrowly ovate-elliptic, margin denticulate or sinuate-dentate; synflorescence not supported by uppermost stem leaves.
         45a. Petiole unwinged; involucre narrowly cylindric, (3–)5–8 mm in diam.; phyllaries straw-colored, subglabrous, without a dark mucro ........................................... 130. S. conyzoides
         45b. Petiole winged; involucre narrowly campanulate, 8–10 mm in diam.; phyllaries whitish, arachnoid, with a dark mucro ......................................................... 131. S. flexuosa

43b. Leaf blade narrowly oblong, narrowly ovate-elliptic, narrowly elliptic, or linear, less than 3 cm wide.
   46a. Leaf blade linear, less than 1 cm wide ........................................ 126. S. integrifolia
46b. Leaf blade narrowly ovate to narrowly elliptic, 1.5–3 cm wide.
47a. Stem winged; leaf base decurrent, margin usually entire ........ 125. S. virgata
47b. Stem unwinged; leaf base not decurrent, margin sinuate-dentate.
48a. Plants 60–100 cm tall; middle stem leaves petiolate; capitula very numerous, in an ample paniculiform-corymbiform synflorescence .................. 122. S. polycarpa
48b. Plants 30–75 cm tall; middle stem leaves sessile; capitula 10–20, in a compact corymbiform synflorescence ........................................ 123. S. chinensis

中新风毛菊 zhong xin feng mao ju
Saussurea colorata C. Winkler.
Herbs 2–12 cm tall, perennial, densely caespitose. Rootstock stout, with fibrously split bark. Caudex stout, much branched, densely covered with remains of petioles, with many sterile and flowering leaf rosettes. Stem solitary, prostrate or ascending, simple or apically branched. Rosette and lower stem leaves petiolate; petiole 0.5–2.5 cm; leaf blade narrowly ovate, 2–4–(–10) × 0.3–0.5(–1.2) cm, slightly fleshy, pinnately lobed or subentire, scabrid, arachnoid or subglabrous, margin coarsely dentate. Upper stem leaves sessile, base weakly amplexicaul. Capitula 3–7, in a corymbiform synflorescence, shortly pedunculate. Involucre narrowly campanulate, 5–12 mm in diam. Phyllaries in 4 or 5 rows, arachnoid to glabrescent, apex obtuse; outer phyllaries ovate, 4–5 × 2–3 mm; middle phyllaries narrowly ovate-elliptic, 5–8 × 1.5–2.5 mm; inner phyllaries narrowly elliptic-linear, 8–11 × 1–1.5 mm. Receptacle with few bristles or naked. Corolla pale purple, 1.3–1.4 cm, gland-dotted, tube 6–7 mm, limb 6–7 mm, lobes 3.5–4 mm. Achenes ca. 4 mm, smooth, glabrous, apex with a short crown. Pappus dirty white; outer bristles 3–6 mm, plumose; inner bristles 1–1.1 mm. Fl. and fr. Jul–Sep.

Herbs 20–50 cm tall, perennial, caespitose. Caudex stout, branched, with many sterile and flowering leaf rosettes. Stems several, erect, branched from middle or above. Rosette and lower stem leaves shortly petiolate; leaf blade linear-oblong, 3–10 × 0.5–1.5(–2) cm, pinnately divided or bipinnately divided, both surfaces green to grayish green, scabrid, and shortly striate or arachnoid; lobes ovate to linear, apex acute. Middle and upper stem leaves gradually smaller upward on stem; uppermost leaves linear, undivided, margin dentate to almost entire. Capitula 2–8, on stem and branch ends, in a corymbiform synflorescence, shortly pedunculate. Involucre cylindrical or narrowly campanulate, 4–5 mm in diam. Phyllaries in ca. 4 rows, often reddish, pubescent or glabrescent, apex subobtuse; outer phyllaries ovate, 3–5 × 2–3 mm; middle phyllaries narrowly ovate-elliptic, 5–8 × 1.5–2.5 mm; inner phyllaries linear-oblong, 8–10 × 1–2 mm. Receptacle with subulate bristles. Corolla reddish purple or pink, ca. 1.2 cm, tube ca. 7 mm, limb ca. 5 mm. Achenes light brown, cylindrical, ca. 2.5 mm, smooth. Pappus white or light brown; outer bristles to 5 mm; inner bristles ca. 9 mm. Fl. and fr. Jul–Sep.

Saline sands, stony slopes, moraines, alpine steppes; ca. 3700–4200 m. Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan].
No specimens of Saussurea famintziniana from China were seen by the present authors. The description here is based on specimens from outside the Flora area and on the treatments by Lipschitz (Fl. URSS 27: 510. 1962) and G. M. Shen (Fl. Xinjiang, 5: 278. 1999).

高盐地风毛菊 gao yan di feng mao ju
Herbs 10–25 cm tall, perennial. Caudex stout, densely covered with remains of old leaves. Stems solitary or several, erect, branched from middle. Rosette leaves petiolate; petiole 2.4(–7.5) cm; leaf blade narrowly elliptic, 5–8 × 1–3 cm, bipinnately divided, both surfaces green and sparsely hispidulous; primary lobes 5–12 pairs, narrowly ovate to narrowly elliptic; secondary lobes 1–4 pairs, margin dentate, teeth and apex mucronate. Stem leaves similar to basal leaves, gradually smaller upward on stem. Capitula 1–6, on stem and branch ends, solitary or in a corymbiform synflorescence; peduncle 1–5 mm. Involucre obconic to narrowly campanulate, 6–10 mm in diam. Phyllaries in 4 or 5 rows, greenish or straw-colored, purplish in apical part, glabrous; outer phyllaries ovate, 4–5 × 2–3 mm, apex acuminate; middle phyllaries narrowly elliptic, 5–10 × 2–5 mm, apex acute; inner phyllaries narrowly elliptic to linear, 10–12 × 1.5–2 mm, apex acute. Receptacle bristles subulate, 6–8 mm. Corolla pale purple, 1.2–2.1(–2.4) cm, tube 5.5–10(–16) mm, limb 6.5–8 mm, lobes 2.5–4 mm. Achenes brown, oblong, ca. 5 mm, glabrous. Pappus dirty white; outer bristles 1–3 mm; inner bristles 0.9–1.3 cm. Fl. and fr. Jul–Sep.

● Rocky dry mountain slopes, alpine saline soils; 2600–3000 m. W Xinjiang.

太加风毛菊 tai jia feng mao ju
Herbs 20–50 cm tall, perennial, caespitose. Caudex stout, branched, with many sterile and flowering leaf rosettes. Stems several, erect, branched from middle or above. Rosette and lower stem leaves shortly petiolate; leaf blade linear-oblong, 3–10 × 0.5–1.5(–2) cm, pinnately divided or bipinnately divided, both surfaces green to grayish green, scabrid, and shortly striate or arachnoid; lobes ovate to linear, apex acute. Middle and upper stem leaves gradually smaller upward on stem; uppermost leaves linear, undivided, margin dentate to almost entire. Capitula 2–8, on stem and branch ends, in a corymbiform synflorescence, shortly pedunculate. Involucre cylindrical or narrowly campanulate, 4–5 mm in diam. Phyllaries in ca. 4 rows, often reddish, pubescent or glabrescent, apex subobtuse; outer phyllaries ovate, 3–5 × 2–3 mm; middle phyllaries narrowly ovate-elliptic, 5–8 × 1.5–2.5 mm; inner phyllaries linear-oblong, 8–10 × 1–2 mm. Receptacle with subulate bristles. Corolla reddish purple or pink, ca. 1.2 cm, tube ca. 7 mm, limb ca. 5 mm. Achenes light brown, cylindrical, ca. 2.5 mm, smooth. Pappus white or light brown; outer bristles to 5 mm; inner bristles ca. 9 mm. Fl. and fr. Jul–Sep.

Saline meadows; 200–700 m. Xinjiang [Kazakhstan, Kyrgyzstan, Russia, Tajikistan].

假盐地风毛菊 jia yan di feng mao ju
Herbs 10–60 cm tall, perennial. Rootstock apically branched. Stems solitary or several, erect or ascending, simple or much branched. Lower stem leaves petiolate; petiole to 1.5 cm; leaf blade oblong, elliptic, rhombic, or narrowly ovate, 0.4–3.5(–10) × 0.2–1.2(–4) cm, fleshy, both surfaces grayish green and scabrid, base cuneate, margin dentate, denticate, or entire, apex acute. Middle and upper stem leaves sessile, narrowly obovate, elliptic, or linear-oblong, margin en-
Herbs 8–40 cm tall, perennial. Rootstock stout, apically branched, densely covered with remains of leaf sheaths. Stems solitary or 2 or 3, ca. 5 mm in diam., erect, simple or branched from base. Leaves petiolate; petiole to 2 cm; leaf blade narrowly elliptic to linear, 5–10 × 0.2–0.8 cm, thick, fleshy, both surfaces green and gland-dotted but otherwise glabrous or sparsely pubescent, base attenuate, margin entire or remotely denticulate, apex acute to obtuse. Involucre campanulate, 8–10 mm in diam. Phyllaries in 4 rows, pilose, gland-dotted, apex acute; outer phyllaries ovate, 6–7 × 4–5 mm; middle phyllaries narrowly elliptic, 7–10 × 1.5–4 mm; inner phyllaries linear, 10–11 × 1–1.5 mm. Receptacle bristles to 2 mm. Corolla purple, 0.9–1.1 cm, gland-dotted, tube 4–6 mm, limb 4–5 mm. Achene obconic, ca. 3 mm, ribbed, glabrous. Pappus white; outer bristles ca. 3 mm, scabrid; inner bristles 1.1–1.2 mm. Fl. and fr. Jul–Aug.

Saline soils and gravelly shores near rivers and lakes; 2700–2800 m. NW Gansu, Nei Mongol, Qinghai, Xinjiang [Mongolia].


阿尔金风毛菊

Herbs 8–40 cm tall, perennial. Rootstock stout, apically branched, densely covered with remains of leaf sheaths. Stems solitary or 2 or 3, ca. 5 mm in diam., erect, simple or branched from base. Leaves petiolate; petiole to 2 cm; leaf blade narrowly elliptic to linear, 5–10 × 0.2–0.8 cm, thick, fleshy, both surfaces green and gland-dotted but otherwise glabrous or sparsely pubescent, base attenuate, margin entire or remotely denticulate, apex acute to obtuse. Involucre campanulate, 8–10 mm in diam. Phyllaries in 4 rows, pilose, gland-dotted, apex acute; outer phyllaries ovate, 6–7 × 4–5 mm; middle phyllaries narrowly elliptic, 7–10 × 1.5–4 mm; inner phyllaries linear, 10–11 × 1–1.5 mm. Receptacle bristles to 2 mm. Corolla purple, 0.9–1.1 cm, gland-dotted, tube 4–6 mm, limb 4–5 mm. Achene obconic, ca. 3 mm, ribbed, glabrous. Pappus white; outer bristles ca. 3 mm, scabrid; inner bristles 1.1–1.2 mm. Fl. and fr. Jul–Aug.

Salt meadows and marshes, alkaline moist soils near rivers and lakes, riverbeds; 1000–3600 m. W Gansu, Heilongjiang, Nei Mongol, Ningxia, Qinghai, Xinjiang [Mongolia, Russia].


盐地风毛菊

Herbs 15–50 cm tall, perennial. Stems solitary or several, branched above middle. Basal and lower stem leaves petiolate; leaf blade ovate to broadly elliptic, 5–30 × 2–6 (–12) cm, fleshy, lyrate-pinnately parted or pinnately lobed, both surfaces green, abaxially gland-dotted, adaxially sparsely strigose or glabrous; lateral lobes elliptic to triangular, margin entire or subentire; terminal lobe triangular, sagittate, or hastate, large, margin sinuately-dentate or entire. Middle and upper stem leaves sessile, oblong, linear-oblong, or narrowly ovate, margin entire or sparsely dentate. Capitula numerous, in a corymbiform synflorescence, pedunculate. Involucre narrowly cylindric, 4–5 mm in diam. Phyllaries in 5–7 rows, arachnoid, glabrescent, apex obtuse to subacute; outer phyllaries ovate, 2–3 × 2–2.5 mm; middle phyllaries narrowly ovate, 3–10 × 1.5–2 mm; inner phyllaries narrowly ovate-elliptic, 10–12 × 1–2 mm. Receptacle bristles subulate, 4–4.5 mm. Corolla pale purple, (1–)1.3–1.6 cm, tube 7–9 mm, limb 6–7 mm. Achene reddish brown, cylindric, 2.5–3 mm, glabrous. Pappus white; outer bristles ca. 3 mm; inner bristles (0.9–)1.3–1.5 cm. Fl. and fr. Jul–Sep. 2n = 28*.

Saline grasslands, alkaline steppes and meadows; 100–3300 m. Gansu, Nei Mongol, Ningxia, Qinghai, Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Uzbekistan; SW Asia, E Europe].


喀什风毛菊

Herbs 4–20 (–30) cm tall, perennial. Taproot slender, 2–4 mm in diam. Stems solitary or several, ascending, erect, or sometimes procumbent, branched from base or apically. Basal leaves petiolate; petiole 0.5–3 cm; leaf blade narrowly ovate to narrowly elliptic, 2–10 × 0.5–3 cm, fleshy, both surfaces grayish green, gland-dotted, and scabridulous but glabrescent, base cuneate, margin entire, sinuate-dentate, runcinate-pinnately lobed, or pinnately parted, apex acute to subobtuse. Lower stem leaves similar to basal leaves but smaller, margin sinuate-dentate or entire. Upper stem leaves sessile, narrowly elliptic to broadly linear. Capitula usually numerous, in a globose condensed corymbiform synflorescence. Involucre cylindric, (3–)5–6 mm in diam. Phyllaries in 6 or 7 rows, purplish red in apical part, subglabrous, margin pubescent, apex acute to obtuse; outer phyllaries ovate to elliptic, 2–4 × 1–1.5 mm; middle phyllaries narrowly elliptic, 4–9 × 1–1.5 mm; inner phyllaries linear, 9–11 × 1 cm. Corolla pink, 1.3–1.8 cm, tube 8–11 mm, limb 6–7 mm, lobes 3–3.5 mm. Achene cylindric, 2–3 mm, ribbed, glabrous, apex with a short crown. Pappus white; outer bristles 1–3 mm, scabrid; inner bristles 1.1–1.2 cm. Fl. and fr. Jul–Sep. 2n = 28*.

Salt meadows and marshes, alkaline moist soils near rivers and lakes, riverbeds; 1000–3600 m. W Gansu, Heilongjiang, Nei Mongol, Ningxia, Qinghai, Xinjiang [Mongolia, Russia].

The basionym, *Serratula salsa* Pallas, Reise Russ. Reich. 3: 607. 1776; *Heterotrichum salsum* (Pallas) M. Bieberstein; *S. crassifolia* Candolle.

Herbs 15–50 cm tall, perennial. Stems solitary or several, branched above middle. Basal and lower stem leaves petiolate; leaf blade ovate to broadly elliptic, 5–30 × 2–6 (–12) cm, fleshy, lyrate-pinnately parted or pinnately lobed, both surfaces green, abaxially gland-dotted, adaxially sparsely strigose or glabrous; lateral lobes elliptic to triangular, margin entire or subentire; terminal lobe triangular, sagittate, or hastate, large, margin sinuately-dentate or entire. Middle and upper stem leaves sessile, oblong, linear-oblong, or narrowly ovate, margin entire or sparsely dentate. Capitula numerous, in a corymbiform synflorescence, pedunculate. Involucre narrowly cylindric, 4–5 mm in diam. Phyllaries in 5–7 rows, arachnoid, glabrescent, apex obtuse to subacute; outer phyllaries ovate, 2–3 × 2–2.5 mm; middle phyllaries narrowly ovate, 3–10 × 1.5–2 mm; inner phyllaries narrowly ovate-elliptic, 10–12 × 1–2 mm. Receptacle bristles subulate, 4–4.5 mm. Corolla pale purple, (1–)1.3–1.6 cm, tube 7–9 mm, limb 6–7 mm. Achene reddish brown, cylindric, 2.5–3 mm, glabrous. Pappus white; outer bristles ca. 3 mm; inner bristles (0.9–)1.3–1.5 cm. Fl. and fr. Jul–Sep. 2n = 28*.

Saline grasslands, alkaline steppes and meadows; 100–3300 m. Gansu, Nei Mongol, Ningxia, Qinghai, Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Uzbekistan; SW Asia, E Europe].
Herbs 14–25 cm tall, perennial. Caudex stout, apically branched, covered with dark brown remains of leaf sheaths. Stems several, ascending to erect, few branched. Basal and lower stem leaves petiolate; leaf blade narrowly obovate-elliptic, to 10 × 2.5 cm, pinnately lobed or pinnately divided, scabrid, hispid; lobe margins dentate, apex acute. Middle and upper stem leaves similar to lower leaves, gradually smaller upward on stem, shortly petiolate to subsessile; leaf blade small, not decurrent. Capitula in a densely corymbiform synflorescence. Involucre 6–10 mm in diam. Phyllaries in ca. 4 rows, apically purple and densely pubescent to glabrescent; outer phyllaries ovate, 3–4 mm, apex subobtuse; middle and inner phyllaries narrowly ovate-elliptic to linear, 4–12 mm, apex subacute. Receptacle with subulate bristles. Corolla pale brown, cylindric, 5–6 mm, glabrous. Pappus dirty white; outer bristles 3–5 mm, rigid, serrulate, persistent; inner bristles 1–1.2 cm. Fl. and fr. Jul–Aug.

Gravelly riverbanks in high mountain valleys, saline soils; ca. 3200 m. W Xinjiang (Wuqia) [Kyrgyzstan].

No specimens of Saussurea kaschgarica were seen by the present authors, and the description here is based on the treatments by Lipschitz (Fl. URSS 27: 509. 1962) and G. M. Shen (Fl. Xinjiang. 5: 280. 1999).


Herbs 40–100 cm tall, perennial. Rhizome stout, with many fibrous roots. Stem solitary, erect, apically branched, unwinged. Basal and lower stem leaves petiolate; petiole 5–13(–20) cm; leaf blade oblong to obovate in outline, (10)–20–50(–70) × (3)–7–10(–15) cm, thick, pinnately divided or pinnately lobed, both surfaces green, scabrid, and hispid; lateral lobes 4–8 pairs, narrowly obovate-elliptic to oblong, margin serrate, dentate, or entire, apex acuminate; terminal lobe narrowly ovate to elliptic. Middle stem leaves gradually smaller upward on stem. Upper stem leaves sessile, narrowly elliptic to linear, undivided. Capitula numerous, in a corymbiform-paniculiform synflorescence. Involucre cylindric to narrowly campanulate, 6–7 mm in diam. Phyllaries in 4 or 5 rows, sparsely arachnoid; outer phyllaries ovate, 3–4 × ca. 2 mm, apex acuminate; middle phyllaries oblong, 4–9 × 1.5–2 mm, apex subobtuse and mucronate; inner phyllaries narrowly elliptic, 9–11 × 1.5–1.5 mm, apex obtuse. Receptacle bristles to 7 mm. Corolla purple, 1.1–1.5 cm, tube 6–9 mm, limb 5–6 mm, lobes 3–3.5 mm. Achene yellowish brown to black, obconic, 5–7 mm, obconsely ribbed, glabrous. Pappus white; outer bristles 2–5 mm; inner bristles ca. 1 cm. Fl. and fr. Aug–Oct. 2n = 26.

Forest margins, thickets, meadows; near sea level to 1000 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Korea, Russia (Far East)].

Herbs 1.5–15 cm tall, perennial. Caudex slender, 2–3 mm in diam., simple or few branched. Stem solitary, erect or ascending, simple. Basal and lower stem leaves petiolate; petiole 1–5 cm, winged; leaf blade ovate, elliptic, obovate, or suborbicular, 1.5–6 × 1.2–4 cm, both surfaces green, glabrescent or arachnoid villous, and glandular hairy at margin, margin sinuate-dentate, apex rounded to acuminate and mucronate. Upper stem leaves similar to lower ones, gradually smaller upward on stem; uppermost stem leaf narrowly elliptic to linear, subterminally congested corymbiform synflorescence. Capitula 3–15–25), in a densely condensed globose or lax corymbiform synflorescence. Involucre campanulate, 8–9 mm in diam. Phyllaries in 4 rows, purple and villous in apical part, apex subacute; outer phyllaries broadly triangular-ovate, 2–3 × ca. 2 mm; middle and inner phyllaries narrowly ovate-elliptic, 3–10 × ca. 2 mm. Receptacle without bristles. Corolla purplish red, 1.2–1.3 cm, glabrous, tube 6–7 mm, limb 6–7 mm. Achene brown, 2.5–8 mm, ribbed, glabrous. Pappus white; outer bristles 4–5 mm, scabrid; inner bristles 1–1.1 cm. Fl. and fr. Aug–Sep.

Alpine meadows, gravelly mountain slopes, moist riverbeds, sand dunes; 2400–4300 m. SW Xinjiang [Tajikistan].


Herbs 1.5–15 cm tall, perennial. Rhizomes procumbent, with many black fibrous roots. Stem solitary, erect, simple or apically few branched. Basal and lower stem leaves withered at anthesis. Middle stem leaves petiolate; petiole to 1 cm; leaf blade ovate, obovate, narrowly ovate-elliptic, or elliptic, 4–13 × 2.5–8 cm, abaxially grayish white and densely tomentose, adaxially green and sparsely strigose, base cuneate, margin serrate, apex acuminate to caudate. Upper stem leaves similar to middle stem leaves but gradually smaller upward on stem, subterminally congested corymbiform synflorescence. Capitula few to numerous, in an ample corymbiform synflorescence, pedunculate, with 19–20 florets. Involucre obconic, ca. 1 cm in diam. Phyllaries in 5 or 6 rows, arachnoid, glabrescent, apex acute and mucronate; outer phyllaries ovate; middle phyllaries narrowly ovate-oblong; inner phyllaries sublinear. Receptacle bristles to 8 mm. Corolla rose-pink, ca. 1.3 cm, tube 6–7 mm, limb 6–7 mm. Achene cylindric to oblong, ribbed, apex with a short crown. Pappus in 2 rows; outer bristles short, scabrid; inner bristles ca. 4 × as long as outer ones. Fl. and fr. Aug–Sep.

Scree slopes; 2700–2900 m. Xinjiang (Tian Shan) [Kyrgyzstan].

No specimens of Saussurea alberti from China were seen by the present authors. This description is based on an image of the cultivated type specimen (LE), on the original description, and on the account by Lipschitz (Fl. URSS 27: 426. 1962).


Herbs, perennial. Stem apically branched, slightly winged. Basal leaves petiolate; leaf blade narrowly ovate-elliptic, to 7 × 2–3 cm, both surfaces green and glabrous, base cuneate, margin sinuate-dentate or runcinate and scabrous, apex acute. Stem leaves narrower than basal leaves, base deciduous to stem, margin subacute. Capitula numerous, at ends of flexuous or apically nodding branches, in an ample corymbiform synflorescence, pedunculate, with 19–20 florets. Involucre obconic, ca. 1 cm in diam. Phyllaries in 5 or 6 rows, arachnoid, glabrescent, apex acute and mucronate; outer phyllaries ovate; middle phyllaries narrowly ovate-oblong; inner phyllaries sublinear. Receptacle bristles to 8 mm. Corolla rose-pink, ca. 1.3 cm, tube 6–7 mm, limb 6–7 mm. Achene cylindric to oblong, ribbed, apex with a short crown. Pappus in 2 rows; outer bristles short, scabrid; inner bristles ca. 4 × as long as outer ones. Fl. and fr. Aug–Sep.

Forests, scree slopes, and alpine and subalpine meadows; 1800–3800 m. Xinjiang (Tian Shan) [Kazakhstan, Kyrgyzstan].


Herbs 10–40(–60) cm tall, perennial. Caudex fibrous, branched, with several sterile and flowering leaf rosettes. Stems solitary or several, erect, simple or branched, slightly winged. Lower stem leaves petiolate; petiole 2–3(–5) cm; leaf blade narrowly ovate, ovate-oblong, or narrowly ovate-elliptic, 5–10 × (0.4–)1.5–4.5 cm, undivided, pinnately cleft, or pinnately lobed, abaxially grayish white and arachnoid tomentose, adaxially green, scabrous, and spinulose-strigose, margin sinuate or dentate. Middle and upper stem leaves sessile, gradually smaller upward on stem, base deciduous. Capitula in a densely congested corymbiform synflorescence, erect, shortly pedunculate, with 10–13 florets. Involucre narrowly cylindric, 4–9 mm in diam. Phyllaries in 4 or 5 rows, apically reddish, arachnoid, glabrescent, with a conspicuous midvein, apex acuminate and with a straight or weakly curved cusp; outer phyllaries ovate; inner phyllaries narrowly ovate-oblong. Receptacle bristles subulate, to 8 mm. Corolla rose-pink, 1.4–1.5 cm, sometimes sparsely glandular, tube 7–8 mm, limb 7–8 mm. Achene ca. 3 mm, glabrous, apex with a short crown. Pappus white or basally pale brown; outer bristles 2–4 mm; inner bristles 1.1–1.2 mm. Fl. and fr. Jul.–Oct.

Forests, scree slopes, and alpine and subalpine meadows; 1800–3800 m. Xinjiang (Tian Shan) [Kazakhstan, Kyrgyzstan].

Grassy slopes, montane forests; 1900–3300 m. Gansu, Hubei, Shaanxi, Sichuan.


新疆风毛菊 xin jiang feng mao ju

Herbs, perennial. Stem apically branched, slightly winged. Basal leaves petiolate; leaf blade narrowly ovate-elliptic, to 7 × 2–3 cm, both surfaces green and glabrous, base cuneate, margin sinuate-dentate or runcinate and scabrous, apex acute. Stem leaves narrower than basal leaves, base deciduous to stem, margin subacute. Capitula numerous, at ends of flexuous or apically nodding branches, in an ample corymbiform synflorescence, pedunculate, with 19–20 florets. Involucre obconic, ca. 1 cm in diam. Phyllaries in 5 or 6 rows, arachnoid, glabrescent, apex acute and mucronate; outer phyllaries ovate; middle phyllaries narrowly ovate-oblong; inner phyllaries sublinear. Receptacle bristles to 8 mm. Corolla rose-pink, ca. 1.3 cm, tube 6–7 mm, limb 6–7 mm. Achene cylindric to oblong, ribbed, apex with a short crown. Pappus in 2 rows; outer bristles short, scabrid; inner bristles ca. 4 × as long as outer ones. Fl. and fr. Aug–Sep.

Scree slopes; 2700–2900 m. Xinjiang (Tian Shan) [Kyrgyzstan].

No specimens of Saussurea alberti from China were seen by the present authors. This description is based on an image of the cultivated type specimen (LE), on the original description, and on the account by Lipschitz (Fl. URSS 27: 426. 1962).

天山风毛菊 tian shan feng mao ju

Saussurea salicifolia (Linnaeus) Candolle var. shensiensis Y. Ling.

Herbs 40–80 cm tall, perennial. Rhizomes procumbent, with many black fibrous roots. Stem solitary, erect, simple or apically few branched. Basal and lower stem leaves withered at anthesis. Middle stem leaves petiolate; petiole to 1 cm; leaf blade ovate, obovate, narrowly ovate-elliptic, or elliptic, 4–13 × 2.5–8 cm, abaxially grayish white and densely tomentose, adaxially green and sparsely strigose, base cuneate, margin serrate, apex acuminate to caudate. Upper stem leaves similar to middle stem leaves but gradually smaller upward on stem, subterminally congested corymbiform synflorescence. Capitula few to numerous, in a paniculate or corymbiform synflorescence, pedunculate. Involucre narrowly campanulate to cylindric, 4–5 mm in diam. Phyllaries in 4 or 5 rows, straw-colored or brown, glabrous; outer phyllaries broadly ovate, 1.5–3 × 1.5–1.5 mm, apex acute; middle phyllaries elliptic, 3–6 × 1–1.5 mm, apex obtuse; inner phyllaries elliptic to broadly linear, 6–8 × 1–1.5 mm, apex obtuse. Corolla purple, 7–8 mm, tube 4–5 mm, limb 2.5–3 mm, lobes 1.5–2 mm. Achene pale brown, ca. 4 mm, glabrous. Pappus pale brown; outer bristles ca. 3 mm, scabrid; inner bristles 6–8 mm. Fl. and fr. Aug–Sep.

Forests, scree slopes, and alpine and subalpine meadows; 1800–3800 m. Xinjiang (Tian Shan) [Kazakhstan, Kyrgyzstan].
**Saussurea larionowii** may be conspecific with the insufficiently known *S. alberti*, which has been described from a cultivated plant. Further studies in the field are needed to clarify the taxonomic status of these species.


**Saussurea komuroba** Saposhnikow.

Herbs or subshrubs, 10–30 cm tall, perennial, caespitose. Roots fibrous. Caudex much branched, with several leaf rosettes and flowering shoots. Stem erect or ascending, simple or apically branched, woody at base. Lower and middle stem leaves petiolate; petiole ca. 2 cm; leaf blade narrowly obovate to oblong, 3–5 × 2–2.5 cm, pinnately lobed to pinnatisect, both surfaces green and gland-dotted; middle lobes 2–5 pairs, triangular-ovate, margin entire or dentate, apex acute to obtuse. Upper stem leaves sessile, gradually smaller upward on stem, pinnately lobed or pinnatisect. Capitula 1–5, solitary or in a corymbiform or paniculiform synflorescence, pedunculate. Involucre campanulate, 7–10 mm in diam. Phyllaries in ca. 5 rows, green or purple, glabrous or sparsely arachnoid, gland-dotted, apex acute; outer phyllaries ovate, 5–6 × 1.5–2.5 mm; middle phyllaries elliptic, 6–9 × ca. 2 mm; inner phyllaries linear-oblong, 9–10 × 1–1.5 mm. Receptacle bristles subulate, 5–6 mm. Corolla purple, 1.2–1.4 cm, gland-dotted, tube 5–6 mm, limb 7–8 mm, lobes ca. 3 mm. Achene ca. 4 mm, ribbed, glabrous, apex with a short crown. Pappus white; outer bristles 3–5 mm; inner bristles 1–1.2 cm. Fl. and fr. Jul–Aug.

Rocky mountain slopes; ca. 1600 m. N Xinjiang (Toli) [Kazakhstan].


**Saussurea konuroba** Saposhnikow.

Herbs or subshrubs, 10–30 cm tall, perennial, caespitose. Roots fibrous. Caudex much branched, with several leaf rosettes and flowering shoots. Stem erect or ascending, simple or apically branched, woody at base. Lower and middle stem leaves petiolate; petiole ca. 2 cm; leaf blade narrowly obovate to oblong, 3–5 × 0.2–0.5 cm, both surfaces grayish white and with a prominent midvein, abaxially densely arachnoid tomentose, adaxially sparsely arachnoid tomentose, margin entire or denticulate and subrevolute, apex acute. Middle and upper stem leaves sessile, gradually smaller upward on stem, linear–oblong, 5–8 × 1–1.5 mm. Receptacle with bristles. Co- cusp; outer phyllaries ovate, 3–8 × 1–2 mm; inner phyllaries linear-oblong, 5–8 × 1–1.5 mm. Phyllaries in ca. 5 rows, green, apically purple, arachnoid or almost glabrous, apex with a short crown. Pappus white; outer bristles 1–5 mm; inner bristles 1–1.2 cm. Fl. and fr. Jul–Aug.

Rocky mountain slopes; 1400–2100 m. NW Xinjiang (Huocheng) [Kazakhstan, Mongolia].

**Saussurea larionowii** may be conspecific with the insufficiently known *S. alberti*, which has been described from a cultivated plant. Further studies in the field are needed to clarify the taxonomic status of these species.


**Saussurea komuroba** Saposhnikow.

Herbs or subshrubs, 10–30 cm tall, perennial, caespitose. Roots fibrous. Caudex much branched, with several leaf rosettes and flowering shoots. Stem erect or ascending, simple or apically branched, woody at base. Lower and middle stem leaves petiolate; petiole ca. 2 cm; leaf blade narrowly obovate to oblong, 3–5 × 2–2.5 cm, pinnately lobed to pinnatisect, both surfaces green and gland-dotted; middle lobes 2–5 pairs, triangular-ovate, margin entire or dentate, apex acute to obtuse. Upper stem leaves sessile, gradually smaller upward on stem, pinnately lobed or pinnatisect. Capitula 1–5, solitary or in a corymbiform or paniculiform synflorescence, pedunculate. Involucre campanulate, 7–10 mm in diam. Phyllaries in ca. 5 rows, green or purple, glabrous or sparsely arachnoid, gland-dotted, apex acute; outer phyllaries ovate, 5–6 × 1.5–2.5 mm; middle phyllaries elliptic, 6–9 × ca. 2 mm; inner phyllaries linear-oblong, 9–10 × 1–1.5 mm. Receptacle bristles subulate, 5–6 mm. Corolla purple, 1.2–1.4 cm, gland-dotted, tube 5–6 mm, limb 7–8 mm, lobes ca. 3 mm. Achene ca. 4 mm, ribbed, glabrous, apex with a short crown. Pappus white; outer bristles 3–5 mm; inner bristles 1–1.2 cm. Fl. and fr. Jul–Aug.

Rocky mountain slopes; ca. 1600 m. N Xinjiang (Toli) [Kazakhstan].


leaves usually withered at anthesis, petiolate. Middle stem leaves sessile or subsessile; leaf blade oblong-elliptic to narrowly ovate-elliptic, 6–15 × 1–4 cm, both surfaces green and stigose, abaxially glandular, margin entire or irregularly dentate, apex acute to acuminate. Upper stem leaves narrowly ovate-elliptic to linear. Capitula numerous, in a long and spreading corymbiform-paniculiform synflorescence. Involucre cylindric to narrowly campanulate, 5–7 mm in diam. Phyllaries greenish, colored in apical part, pubescent, apex subobtuse to obtuse; outer phyllaries ovate to ovate-oblong; inner phyllaries linear-oblong. Receptacle bristles ca. 3 mm. Corolla bluish purple, ca. 1.4 cm, tube ca. 7 mm, limb ca. 7 mm. Achene smooth, 7–8 mm. Pappus dirty white; outer bristles ca. 3 mm; inner bristles 8–10 mm. Fl. and fr. Jun–Aug.

Steppe meadows, thickets. N Xinjiang (Tacheng) [Kazakhstan].

No specimens of *Saussurea elata* from China have been seen by the present authors. The description here is based on plants from outside the Flora area, as well as on the treatments by Lipschitz (Fl. URSS 27: 422, 1962) and G. M. Shen (Fl. Xinjiang. 5: 285. 1999).


灰白风毛菊 hui bai feng mao ju

*Saussurea cana* var. *angustifolia* Ledebour; *S. fruticulosa* Karelin & Kirilov.

Herbs 8–25 cm tall, perennial, densely caespitose. Caudex much branched, with many leaf rosettes and flowering shoots. Stems erect, simple or apically branched. Rosette and lower stem leaves petiolate; petiole 1.5–3 cm; leaf blade narrowly elliptic, linear-oblong, or linear, 1.5–10 × 0.2–1.5 cm, abaxially grayish white and densely tomentose, adaxially grayish green and sparsely tomentose, margin entire, dentate, or pinnately lobed; lateral lobes or lateral teeth few, small, apex acuminate. Middle and upper stem leaves petiolate or sessile; leaf blade gradually smaller upward on stem. Uppersmost stem leaves sessile, linear. Capitula 4–20, in a corymbiform synflorescence, shortly pedunculate. Involucre narrowly cylindric, 4–8 mm in diam. Phyllaries in 4–7 rows, apically purplish red, sparsely arachnoid, apex acute to obtuse; outer phyllaries ovate, 3–3.5 × ca. 2 mm; middle phyllaries ovate to narrowly elliptic, 3.5–9 × 1.5–2 mm; inner phyllaries linear, 9–10 × 1.5 mm. Receptacle bristles subulate, to 8 mm. Corolla pale red, 1.2–1.3 cm, gland-dotted, tube 6–7 mm, limb 6–7 mm. Achene brown, cylindric, 4–7 mm, glabrous. Pappus white; outer bristles 2–3 mm; inner bristles 7–11 mm. Fl. and fr. Jul–Aug.

River valleys, rocky and dry mountain slopes; 800–2800 m. Gansu, Nei Mongol, Ningxia, Qinghai, Shanxi, Sichuan, Xinjiang [Kazakhstan, Russia (Siberia)].


西北风毛菊 xi bei feng mao ju

*Saussurea petrovii* var. *latifolia* H. C. Fu.

Herbs 5–30 cm tall, perennial. Roots woody, fibrous. Caudex branched, covered with remains of leaf sheaths. Stem 1.5–2 mm in diam., erect, simple or apically branched. Lower and middle stem leaves sessile, linear, linear-oblong, or oblong, 2–11 × 0.1–0.4 cm, abaxially grayish white and densely tomentose, adaxially green and glabrous, base attenuate, margin revolute and entire or with 1–5 pairs of remote teeth, apex acute to acuminate. Upper stem leaves narrowly linear, 1–4 × ca. 0.1 cm. Capitula 2–6, in a corymbiform synflorescence, pedunculate. Involucre cylindric, 5–8 mm in diam. Phyllaries in 4 or 5 rows, greenish yellow to straw-colored, apically purple, sparsely arachnoid, gland-dotted, apex shortly acuminate; outer phyllaries ovate, 2–3 × 1–2 mm; middle phyllaries oblong, 3–7 × 1–2 mm; inner phyllaries narrowly elliptic to linear, 7–9 × 1–2 mm. Receptacle with bristles. Corolla purple, (0.8–)1–1.4 cm, minutely gland-dotted, tube 5–7 mm, limb 5–7 mm, lobes 3–3.5 mm. Achene brown, cylindric, 3–4 mm, obtusely 4-angled, glabrous. Pappus white; outer bristles 2–3 mm, scabrid; inner bristles (0.7–)0.9–1.1 cm. Fl. and fr. Jun–Sep.

● Mountain slopes; 1700–2500 m. Gansu, Nei Mongol, Ningxia.

*Saussurea cana* and *S. petrovii* are very closely related and may even be conspecific. Further studies are needed to clarify if the characters that distinguish *S. petrovii* fall within the variation range of *S. cana*.


伊宁风毛菊 yi ning feng mao ju

*Saussurea canescens* var. *major* C. Winkler.

Herbs 1.5–20 cm tall, perennial, caespitose. Rootstock stout, fibrously split. Caudex much branched, with many leaf rosettes and flowering shoots, covered with remains of leaf sheaths. Stem solitary, ascending or erect, simple. Rosette and lower stem leaves petiolate; leaf blade narrowly elliptic or narrowly obovate, 1.5–7 × 0.2–0.6 cm, both surfaces grayish green to grayish white and densely arachnoid tomentose, margin sinuate-dentate or pinnately lobed. Upper stem leaves subsessile, linear to subulate, 0.6–2 cm. Capitula 1–3, solitary or in a condensed corymbiform synflorescence, slightly nodding, shortly pedunculate. Involucre campanulate, (5–)7–10 mm in diam. Phyllaries in ca. 5 rows, apically purplish, arachnoid pubescent, glabrescent, apex acuminate; outer phyllaries ovate; inner phyllaries narrowly ovate-elliptic to linear. Receptacle with bristles. Corolla pink, 1.1–1.3 cm, tube 5–6 mm, limb ca. 7 mm. Achene brown, cylindric, 2–3 mm, with a short crown. Pappus basally pale brown, apically white; outer bristles 2–3 mm; inner bristles 1–1.1 cm. Fl. and fr. Jul–Aug.

Rocky mountain slopes; 1600–2500 m. Xinjiang [Kazakhstan].


倒卵叶风毛菊 dao luan ye feng mao ju

Herbs 15–25 cm tall, perennial. Roots stout, fibrous. Caudex branched, with several leaf rosettes and flowering shoots. Stem solitary, erect, simple or branched. Basal and lower stem leaves petiolate; leaf blade obovate, 7–8 × 1.5–2 cm, pinnately lobed, pinnately dentate, or lyrate-pinnately lobed, both surfaces green, strongly scabrous, hispid, apex rounded. Middle and upper stem leaves sessile, gradually smaller upward on stem, narrowly ovate-elliptic, base amplexicaul, margin pin-
nately dentate, apex acuminate. Capitula 1 to few, solitary or in a corymbiform synflorescence, sessile or shortly pedunculate. Involucre obconic, 7–10 mm in diam. Phyllaries in 4–6 rows, pubescent, apex attenuate into a short cusp; outer phyllaries ovate; inner phyllaries narrowly ovate-elliptic to linear. Receptacle with bristles. Corolla pale red, 1.4–1.5 cm, tube ca. 7 mm, limb ca. 8 mm, lobes ca. 4 mm. Achene cylindrical, 4–5 mm, glabrous. Pappus white; outer bristles 1–5 mm; inner bristles 1.2–1.3 cm. Fl. and fr. Jun–Aug.

Mountain steppes and rock crevices; 1600–2200 m. NW Xinjiang (Bolé, Huocheng) [Kazakhstan].


寡头风毛菊 gua tou feng mao ju

Herbs or subshrubs, 20–50(–100) cm tall, perennial, densely caespitose. Rootstock stout and fibrous. Caudex much branched. Stems very numerous, 1.5–2 mm in diam., ascending or erect, virgately branched from base, woody at base. Rosette and lower stem leaves shortly petiolate; leaf blade linear, 4.5–5.5 × 0.5–0.6 cm, thick, both surfaces greyish green, abaxially arachnoid and gland-dotted, margin entire or sparsely dentate, apex mucronate. Middle and upper stem leaves gradually smaller upward on stem, 3–30 × 1–3 mm. Capitula solitary or to 3 clustered on end of branches in a corymbiform synflorescence, pedunculate. Involucre narrowly campanulate to tubular, 3–6 mm in diam. Phyllaries in 4–6 rows, straw-colored, apically purplish, pubescent, gland-dotted, glabrescent, apex obtuse to shortly acuminate; outer phyllaries broadly ovate, 1–2 × 0.5–1 mm; middle and inner phyllaries narrowly ovate to linear, 2–7 × ca. 1 mm. Receptacle bristles subulate, to 8 mm. Corolla pink, ca. 1.6 cm, gland-dotted, tube ca. 6 mm, limb ca. 1 cm, lobes ca. 4 mm. Achene dark brown, 5–6 mm, 4-ribbed. Pappus white; outer bristles 1–4 mm; inner bristles 1.1–1.1 cm. Fl. and fr. Aug–Sep.

Gravelly shores, saline deserts; ca. 600 m. Xinjiang [W Mongolia].


雅布赖风毛菊 ya bu lai feng mao ju

Herbs 12–35 cm tall, perennial. Rootstock stout. Stems many, erect or ascending, apically few branched, base densely covered with yellowish white or yellowish brown remains of leaf petiole and rachis. Lower stem leaves 2–15 cm, irregularly pinnately parted; segments 2 or 3, distant, needlelike, 3–20 × 0.5–3 mm, both surfaces sparsely gland-dotted otherwise glabrous, base widened and semiamplexicaul, margin entire, apex acuminate or sometimes obtuse and mucronate. Middle and upper stem leaves gradually smaller upward on stem, filiform, 1.5–3 cm, undivided. Capitula 1–4, solitary or in a lax corymbiform synflorescence. Involucre obconic, obovoid, or campanulate, 5–8 mm in diam. Phyllaries yellowish green, in 7 or 8 rows, glandular hairy, apex acute to acuminate and mucronate; outer phyllaries ovate; middle phyllaries narrowly ovate; inner phyllaries linear. Receptacle bristles subulate, 2–2.5 mm. Corolla purple, 1.2–1.5 cm, gland-dotted, tube 7–8 mm, limb 5–7 mm. Achene cylindrical to ovoid, 4–5-angled, sparsely glandular. Pappus white; outer bristles 2–3 mm; inner bristles 9–10 mm. Fl. and fr. Aug–Sep.

● Desert areas; 1300–1400 m. Nei Mongol (Alxa Meng).

No specimens of *Saussurea yabulaiensis* were seen by the present authors. The description here is based on the original publication and on the treatment by H. C. Fu (in Ma, Fl. Intramongol., ed. 2, 4: 749. 1993).

This species is close to and may be conspecific with *Saussurea catharinae* Lipschitz from Mongolia, which was described as having always undivided leaves.


毓泉风毛菊 yu quan feng mao ju

Herbs 4–15 cm tall, perennial. Caudex stout, much branched. Stems many, erect or ascending, base densely covered with brown remains of old petioles. Basal and lower stem leaves 3–7 cm, pinnately divided; segments 3–5, linear to narrowly ovate-linear, 3–10 × 0.5–2 cm, both surfaces sparsely arachnoid and glandular, margin entire or denticulate, apex acute to subobtuse and mucronate. Middle and upper stem leaves gradually smaller upward on stem, pinnately parted or undivided. Capitula 1–3, solitary or in a corymbiform synflorescence. Involucre campanulate, 8–10 mm in diam. Phyllaries in 5 or 6 rows, purplish, arachnoid, glandular; outer phyllaries ovate, apex acute; inner phyllaries narrowly ovate to linear, apex acuminate. Receptacle with bristles. Corolla rose, 1.3–1.6 cm, tube 6–7 mm, limb 7–9 mm. Achene cylindrical, ca. 4 mm, 4- or 5-angled, rugose, densely glandular. Pappus white; inner bristles 1.1–1.2 cm. Fl. and fr. Jul–Aug.

● Stony mountain slopes; ca. 2400 m. Nei Mongol (Alxa Meng, Longshou Shan).

No specimens of *Saussurea mae* were seen by the present authors, and the treatment here is based on the original description.


荒漠风毛菊 huang mo feng mao ju

Herbs 30–40 cm tall, perennial. Caudex stout, apically covered with blackish brown remains of old petioles. Stem solitary, erect, apically branched. Lower stem leaves petiolate; petiole 1–2 cm, winged, base semiamplexicaul; leaf blade ovate to narrowly ovate-elliptic in outline, 5–9 × 1.5–2 cm, bipinnately parted; segments 11–13 pairs, linear, needlelike, 2–12 × 1–3 mm, both surfaces arachnoid and densely glandular, apex obtuse to acute. Middle and upper stem leaves gradually smaller upward on stem, linear, undivided, margin subentire to dentate. Capitula many, in a paniculiform or corymbiform synflorescence, pedunculate. Involucre campanulate, 7–12 mm in diam. Phyllaries in 5–7 rows, apical half and margin purple, arachnoid pubescent, midvein dark; outer phyllaries ovate, apex obtuse or mucronate; middle phyllaries oblong-elliptic, apex acute; inner phyllaries narrowly elliptic to linear, apex obtuse. Receptacle bristles 1.5–6 mm. Corolla rose-purple, ca. 1.4 cm, tube ca. 6 mm, limb ca. 8 mm. Achene dark green, obconic, 3.5–4 mm, 4-angled, sparsely glandular, apically squamulose, apex with an
obtusely dentate crown. Pappus white; outer bristles short; inner bristles 1–1.1 cm. Fl. Sep.

- Desert areas; 1300–1400 m. Nei Mongol (Ih Ju Meng).

No specimens of *Sauurea deserticola* were seen by the present authors, and the description here is based on the treatment by H. C. Fu (in Ma, Fl. Intramongol., ed. 2, 4: 749. 1993).


柳叶风毛菊 liu ye feng mao ju


Herbs 15–50 cm tall, perennial, caespitose. Roots stout, fibrous. Caudex much branched near ground level. Stems usually numerous, erect, simple or branched. Leaves shortly petiolate or sessile; leaf blade narrowly elliptic to linear, 2–10 × 0.2–0.5 cm, abaxially white and densely tomentose, adaxially green and glabrous or sparsely pubescent, base cuneate-attenuate, margin entire or rarely basally dentate and usually revolute, apex acuminate. Capitula numerous in flower heads, pedunculate. Involucre campanulate, 8–10 mm in diam. Phyllaries in 4 or 5 rows, purplish red; outer phyllaries ovate, 1.5–2 × 1.5–2 mm, apex acute to obtuse; middle phyllaries narrowly ovate-elliptic to linear, 6–8 × 1–2 mm, apex acute. Receptacle bristles 6–8 mm. Corolla pink, 1.2–1.5 cm, tube 6–8 mm, limb 6–7 mm. Achene brown, 3.5–4.5 mm, glabrous. Pappus white; outer bristles ca. 2 mm; inner bristles 1–1.1 cm. Fl. and fr. Jun–Sep.

- Thickets, meadows, moist places in gullies; 1600–3800 m. Gansu, Heilongjiang, Nei Mongol [Mongolia, Russia (Siberia)].


纹苞风毛菊 wen bao feng mao ju

Herbs 15–35 cm tall, perennial. Roots woody, fibrous. Caudex branched with several flowering shoots. Stem erect or ascending, simple or rarely branched from base. Basal and lower stem leaves shortly petiolate; leaf blade ovate-elliptic to oblong, 8–10 × 1.5–2 cm, abaxially grayish white and densely arachnoid tomentose, adaxially green, almost glabrous, and scabrous, margin sinuate-dentate to pinnately cleft. Upper stem leaves sessile, gradually smaller upward on stem, usually with sterile shoots in axils. Capitula 2–5, in a condensed corymbiform synflorescence, pedunculate. Involucre campanulate, 8–10 mm in diam. Phyllaries in 4 or 5 rows, straw-colored, pubescent, margin distinct, narrow, and brown or black, apex obtuse to rounded; outer phyllaries ovate; inner phyllaries oblong. Receptacle bristles subulate, to 8 mm. Corolla dark red, ca. 1.2 cm, gland-dotted, tube ca. 6 mm, limb ca. 6 mm. Achene dark brown, cylindric, 4–6 mm, glabrous. Pappus white; outer bristles 1.5–3 mm; inner bristles 1–1.1 cm. Fl. and fr. Jul–Oct.

- Mountain steppes, meadows; 1300–2700 m. Xinjiang.


多头风毛菊 duo tou feng mao ju

*Sauurea polycephala* Franchet, J. Bot. (Morot) 8: 338. 16 Oct 1894, not *S. tibetica* C. Winkler (1894); *S. leucota* Handel-Mazzetti.

Herbs 60–100 cm tall, perennial. Rhizome stout. Stem solitary, erect, much branched in apical part, unwinged. Basal and lower stem leaves withered at anthesis. Middle stem leaves petiolate; petiole 4–7 mm; leaf blade narrowly ovate to narrowly elliptic, 10–18 × 1.5–3 cm, abaxially white and densely tomentose, adaxially green and sparsely strogose, base cuneate, margin denticulate, apex acuminate. Upper stem leaves narrowly ovate-elliptic, gradually smaller upward on stem. Capitula very numerous, in an ample corymbiform-paniculiform synflorescence, pedunculate. Involucre cylindric, 5–6 mm in diam. Phyllaries in 5 or 6 rows; outer phyllaries ovate, 2–3 × 1.5–2 mm, sparsely arachnoid, apex acuminate; middle phyllaries narrowly elliptic, 3–6 × 1–1.5 mm, densely villous, apex acute; inner phyllaries narrowly elliptic, 6–9 × 1–1.5 mm, sparsely villous, apex obtuse. Receptacle bristles to 5 mm. Corolla purple, 0.9–1.1 cm, tube 5–6 mm, limb 4–5 mm, lobes 2.5–3 mm. Achene brown, ca. 3 mm, ribbed. Pappus white; outer bristles ca. 2 mm; inner bristles ca. 8 mm. Fl. and fr. Aug–Sep.

- Forests, forest margins, near mountain trails, mountain slopes; 1200–2200 (–4600) m. Hubei, Sichuan.

*Sauurea leucota*, described from W Sichuan, is preliminarily included here as a synonym; it may deserve separate taxonomic status. It is certainly not conspecific with *S. salicifolia*.


中华风毛菊 zhong hua feng mao ju


Herbs 30–75 cm tall, perennial. Stem solitary, simple or apically branched. Basal leaves withered at anthesis. Lower stem leaves sessile, narrowly ovate-elliptic to narrowly elliptic, 9–10 × 1.5–2.5 cm, abaxially white, densely tomentose, and gland-dotted, adaxially green and glabrous, base cuneate, margin denticulate, apex long acuminate. Middle stem leaves sessile, narrowly ovate-elliptic, 9–12 × 1.5–2.5 cm, base semi-amplexical, margin denticulate, apex acuminate. Upper stem leaves sessile, narrowly elliptic to linear, margin entire. Capitula 10–20, in a compact corymbiform synflorescence, pedunculate. Involucre cylindric, 4–5 mm in diam. Phyllaries in 4 or 5 rows, straw-colored, pubescent; outer phyllaries ovate, 2–3 × 1–1.5 mm, sparsely arachnoid, apex acuminate; middle phyllaries narrowly elliptic, 3–8 × 1–2 mm, acutely apressed villous; inner phyllaries linear, 7–8 × 1–1.5 mm, apex obtuse to acute. Receptacle bristles 2–3 mm. Corolla pale purple, 8–9 mm, tube 3–4 mm, limb 4–5 mm, lobes 2–2.5 mm. Achene brown, ca. 2 mm, glabrous. Pappus straw-colored; outer bristles 1–3 mm; inner bristles 5–7 mm. Fl. and fr. Aug–Sep.

- Grasslands on mountain slopes; 1900–2300 m. Hebei (Xiaowutai Shan).
**Saussurea chinensis** is very close to *S. polycephala*, only differing by fewer capitula in a smaller and more compact synflorescence.


**Zhu xi feng mao ju**

Herbs 30–50 cm tall, perennial. Rhizome stout, with numerous fibrous roots. Stems solitary or 3–5, erect, apically branched. Basal and lower stem leaves sessile, narrowly ovate-elliptic, 5–15 × 1–2 cm, abaxially light green and puberulent, adaxially green and puberulent, base attenuate, margin sparsely dentate or incised, apex acuminate and mucronate. Middle stem leaves narrowly ovate-elliptic, margin usually entire or sometimes minutely denticulate. Upper stem leaves smaller upward on stem, margin entire. Capitula numerous, in a lax corymbose-synflorescence, shortly pedunculate. Involucre campanulate, 8–10 mm in diam. Phyllaries in ca. 5 rows; outer phyllaries green, narrowly ovate-oblong, 4–5 × ca. 1 mm, sparsely arachnoid, apex acute; inner phyllaries green, narrowly ovate-elliptic, 10–12 × 1–1.5 mm, glabrous, apex acuminate. Receptacle bristles filiform, 5–6 mm. Corolla purplish red, ca. 1.4 cm, elliptic, 10–12 × 1–1.5 mm, glabrous, apex acuminate. Receptacle bristles subulate, ca. 3 mm. Papillae brown. Pappus straw-colored; outer bristles ca. 3 mm; inner bristles ca. 9 mm. Fl. and fr. Aug–Sep.

- Rock crevices, sandy places along streams; ca. 900 m. Hubei (Zhuixi).

### 125. **Saussurea virgata** Franchet, J. Bot. (Morot) 8: 340. 1894.

**Zhou zhuang feng mao ju**

Herbs 20–90 cm tall, perennial. Stem solitary, 5–7 mm in diam., erect, apically branched, winged, densely leafy. Lower and middle stem leaves shortly petiolate or sessile; leaf blade narrowly ovate-elliptic, 6–10 × 1–2 cm, abaxially greyish white or greyish green and arachnoid, adaxially green and glabrous or with short glands hairs, base decurrent, margin entire, crenate, or apically denticulate, apex acute to acuminate. Upper stem leaves linear, 1–5 × 0.1–0.3 cm, margin entire. Capitula numerous, clustered at end of branches, in a corymbose synflorescence, shortly pedunculate. Involucre narrowly obovoid, 5–8 mm in diam. Phyllaries in ca. 5 rows, narrowly ovate-elliptic to linear, arachnoid, apex acute; outer phyllaries ovate-elliptic, 5–6 × 2–2.5 mm, apical part herbaceous and reflexed, apex acuminate to ciliate; middle and inner phyllaries 7–11 × 1–2 mm, apically and near margin purplish red, scarious, apex acute and erect. Receptacle bristles 4–7 mm. Corolla purplish red, ca. 9 mm. Achenes glabrous. Pappus pale brown; outer bristles scabrid; inner bristles ca. 8 mm. Fl. and fr. Jul–Sep.

- Grasslands on mountain slopes; 2800–3400 m. Yunnan (Dali, Huize).


**Quan yuan ye feng mao ju**

Herbs 30–100 cm tall, perennial. Stem erect, simple or branched in apical part. Basal and lower stem leaves withered at anthesis. Middle stem leaves sessile or subsessile; leaf blade narrowly ovate-elliptic to linear, 5–12 × 0.6–0.7 cm, abaxially white and densely tomentose, adaxially green and slightly scabrid, base cuneate-attenuate, margin entire and revolute, apex long acuminate. Upper stem leaves similar to middle stem leaves, gradually smaller upward on stem. Capitula numerous, in a corymbic-paniculate synflorescence, shortly pedunculate. Involucre narrowly campanulate, ca. 5 mm in diam. Phyllaries in 5 or 6 rows, dark purple, sparsely pubescent, glabrescent; outer phyllaries ovate, ca. 3 × 1–1.5 mm, apex acute to obtuse, middle phyllaries elliptic, ca. 7 × 2 mm, apex obtuse; inner phyllaries narrowly linear-elliptic, 7–8 × ca. 1 mm, apex acute to obtuse. Corolla purplish red, ca. 9 mm, tube ca. 4 mm, limb ca. 5 mm. Achenes brown, ca. 3 mm. Pappus straw-colored; outer bristles ca. 3 mm; inner bristles ca. 9 mm. Fl. and fr. Aug–Sep.

- Thickets in mountain valleys, grasslands, by trails on mountain slopes; 2000–3500 m. NW Sichuan, ?NW Yunnan (Dêqên).

It is not clear if the much smaller specimens of *Saussurea integrifolia* from Yunnan (10–18 cm tall) with fewer (3–7) but slightly larger capitula really belong to the same taxon as the plants from NW Sichuan.

### 127. **Saussurea sutchuenensis** Franchet, J. Bot. (Morot) 8: 353. 1894.

**Si chuan feng mao ju**

**Saussurea dutailiyanavar. macrocephala** (Y. Ling) X. Y. Wu; **Saussurea dutailiyanavar. shensiensis** Y. Y. Pai; **Saussurea rufostrigillosa** Y. Ling; **Saussurea rufostrigillosavar. macrocephala** Y. Ling.

Herbs 40–100 cm tall, perennial. Rhizome stout. Stem solitary, erect, apically branched. Basal and lower stem leaves petiolate; petiole 10–25 cm; leaf blade ovate to triangular-ovate, ca. 14 × 10 cm, both surfaces green and glabrous or strigillose, base truncate to cordate, margin sharply dentate, apex acuminate. Median stem leaves petiolate; petiole 1.5–3.5 cm; leaf blade gradually smaller upward on stem, ovate to triangular-ovate, 4–6 × 2–4 cm. Upper stem leaves petiolate; leaf blade narrowly ovate, base cuneate-attenuate. Capitula numerous, clustered 3–6 at end of branches in a corymbiform-paniculiform synflorescence, pedunculate. Involucre campanulate to obconic, 5–9–(15) mm in diam. Phyllaries in 6 or 7 rows, arachnoid lanate; outer and middle phyllaries narrowly ovate to narrowly ovate-elliptic, 3–10 × 1–2 mm, margin apically crenate-dentate, apex herbaceous, acute, and reflexed; inner phyllaries linear, 8–10 × 1.5–2 mm, apex obtuse and erect. Receptacle bristles subulate, 4–6 mm. Corolla purple or white, 1–1.2(–1.5) cm, tube 6–7 mm, limb 5–5.5 mm, lobes 3–3.5 mm. Achenes brown, ca. 3 mm, smooth, glabrous. Pappus straw-colored; outer bristles 2–4 mm; inner bristles 7–9 mm. Fl. and fr. Jul–Sep.

- Forests, forest margins; 700–2000 m. N Chongqing (Chengkou), Henan (Lushi), ?Hubei, Shaanxi.


**Chang geng feng mao ju**

**Saussurea saligniformis** Handel-Mazzetti; **Saussurea wilsoniana** Handel-Mazzetti.

Herbs 0.6–1.4 m tall, perennial. Rhizome stout. Stems solitary or few, (2–)5–8 mm in diam., erect, apically much branched, apically flexuous. Basal leaves withered at flowering...
time. Lower and middle stem leaves petiolate; petiole 1.5–5 cm; leaf blade narrowly ovate to oblong, 8–19 × 2–6.5 cm, both surfaces green, abaxially with a few isolated articulate hairs, adaxially glabrous, base cordate to rounded, margin denticulate and sparsely ciliate, apex acuminate to caudate. Upper stem leaves gradually smaller upward on stem; petiole 0.5–1.5 cm; leaf blade narrowly elliptic, base cuneate to rounded. Capitula numerous, in a diffuse corymbiform-paniculiform synflorescence, pedunculate. Involucre campanulate, 6–8(–13) mm in diam. Phyllaries in 4–6 rows, straw-colored, sometimes apically tinged purple, glabrous or apically bearded, apex obtuse to subacute; outer phyllaries ovate, 1.5–3 × 1–2 mm; middle phyllaries narrowly ovate, 3–10 × 1.5–2 mm; inner phyllaries narrowly elliptic to linear, 10–14 × 1–1.5 mm. Receptacle bristles bristly brownish, subulate, 4–8 mm. Corolla purple, 9–10 mm, tube 4.5–7 mm, limb 5–6.5 mm, lobes 3–3.5 mm. Achene blackish brown, cylindrical, 3–5 mm, smooth, glabrous. Pappus pale brown; outer bristles 2–4 mm; inner bristles (0.8–)1–1.1 cm. F1. and fr. Jul–Oct.

- Forests, forest margins, montane meadows, rocky slopes; 1400–3700 m. Gansu, Guizhou, Henan, Hubei, Shaanxi, Sichuan, NW Yunnan (Lijiang, Zhongdian).

129. Saussurea saligna Franchet, J. Bot. (Morot) 8: 345. 1894.  
尾尖风毛菊 weii jian feng mao ju

Herbs 70–120 cm tall, perennial. Stem solitary, 5–7 mm in diam., erect, apically much branched. Lower and middle stem leaves petiolar; petiole 1–3 cm; leaf blade narrowly ovate-elliptic to oblong, 10–20 × 3–4 cm, both surfaces green and glabrous or subglabrous, base rounded to truncate, margin denticulate, apex caudate-acuminate. Upper stem leaves shortly petiolate; leaf blade narrowly ovate-elliptic, 7–15 × 1–3 cm. Capitula numerous, clustered 5–7 at end of branches in a congested corymbiform synflorescence, shortly pedunculate. Involucre campanulate to obconic, 6–10 mm in diam. Phyllaries in 5–7 rows, straw-colored with green veins, subglabrous, scariosus, apically bearded, apex obtuse; outer phyllaries ovate, 2–3 × 1–1.5 mm; middle phyllaries oblong to narrowly elliptic, 3–8 × 1–1.5 mm; inner phyllaries narrowly obovate-elliptic to linear, 8–10 × 1–1.5 mm. Receptacle bristles subulate, 5–7 mm. Corolla white or purple, 9–10 mm, tube 4–6 mm, limb 4–5 mm, lobes 3–3.5 mm. Achene cylindrical, 4–5 mm, ribbed, glabrous. Pappus dirty white; outer bristles 2–3 mm; inner bristles 8–10 mm. Fl. and fr. Jul–Oct.

- Mountain slopes, forests; 1200–2500 m. N Chongqing (Chengkou), Shaanxi.

假蓬风毛菊 jia peng feng mao ju


Herbs 0.9–1.2 m tall, perennial. Stem solitary, ca. 5 mm in diam., erect, branched from middle. Middle stem leaves petiolate; petiole to 2.5 cm; leaf blade elliptic to ovate, 7.5–15(–20) × 5–6 cm, abaxially grayish green to grayish white and densely tomentose, adaxially green and sparsely strigose but glabrescent, base cuneate-attenuate, margin denticulate, shallowly crenate, or entire, apex acuminate. Upper leaves similar, gradually smaller upward on stem, narrowly elliptic, 8–15 × 1.5–3 cm. Uppermost stem leaves narrowly elliptic to linear. Capitula numerous, in a corymbiform-paniculiform synflorescence, sessile or shortly pedunculate. Involucre narrowly cylindric, 3–5 mm in diam. Phyllaries in 5 or 6 rows, yellowish green, sparsely arachnoid or glabrescent; outer phyllaries oblong, 1.5–2 × 0.5–0.8 mm, apex acute and mucronate; middle phyllaries ovate to narrowly elliptic, 2–7 × 0.8–1.5 mm, apex acute to obtuse and without a mucro; inner phyllaries narrowly elliptic to linear, 7–9 × 0.5–1 mm, apically bearded, apex obtuse. Receptacle bristles 4–5 mm. Corolla purple, 0.9–1.1 cm, tube 4–5 mm, limb 5–6 mm, lobes 3.5–4 mm. Achene (immature) ca. 2 mm, glabrous. Pappus dirty white; outer bristles 3–4 mm; inner bristles 8–9 mm. Fl. Jul–Aug.

- Forests; 1000–2300 m. Guizhou, Henan, Hubei, Shaanxi, Sichuan.

城口风毛菊 cheng kou feng mao ju

_Saussurea flexuosa_ var. _penicillata_ Franchet; _S. tsinlingensis_ Handel-Mazzetti.

Herbs 50–100 cm tall, perennial. Rhizome stout. Stem solitary, erect, apically branched. Basal leaves withered at anthesis. Lower and middle stem leaves petiolate; petiole 2–7 cm, winged and usually with a pair of lobes; leaf blade ovate, elliptic, or narrowly ovate-elliptic, 6–17 × 4–9 mm, abaxially grayish white and densely arachnoid tomentose, adaxially green, scabrid, and sparsely strigose, base cordate, truncate, or cuneate, margin serrulate or sinuate-dentate, apex acuminate. Upper stem leaves shortly petiolate; leaf blade gradually smaller upward on stem, narrowly elliptic, base cuneate, margin denticulate or entire. Capitula numerous or few, in a laxly corymbiform or paniculiform synflorescence, pedunculate. Involucre narrowly campanulate, 7–10 mm in diam. Phyllaries in 4 or 5 rows, apically red to blackish purple, sparsely arachnoid lanate; outer phyllaries ovate, 2–3 × 1–1.5 mm, apex acute, with a black straight mucro; middle phyllaries ovate-elliptic, 3–7 × 1.5–2 mm, apex acute; inner phyllaries narrowly elliptic to linear, 7–10 × 1.5–2 mm, apex acute to obtuse. Corolla red, 1–1.1 cm, tube 4–5 mm, limb ca. 6 mm. Achene brown, cylindrical, ca. 4 mm, glabrous. Pappus pale brown; outer bristles 2–4 mm, scabrid; inner bristles 9–10 mm. Fl. and fr. Jul–Sep.

- Forests, forest margins, thickets, near trails, meadows; 1300–2000 m. Chongqing, Gansu, Henan, W Hubei, S Shaanxi, Sichuan.

优雅风毛菊 you ya feng mao ju

_Saussurea elegans_ var. _nivea_ Ledebour; _S. tenuissima_ Handel-Mazzetti.

Herbs 0.9–1.2 m tall, perennial. Stem solitary, ca. 5 mm in diam., erect, bracted from middle. Middle stem leaves petiolate; petiole to 2.5 cm; leaf blade elliptic to ovate, 7.5–15(–20) × 5–6 cm, abaxially grayish green to grayish white and densely tomentose, adaxially green and sparsely strigose but glabrescent, base cuneate-attenuate, margin denticulate, shallowly crenate, or entire, apex acuminate. Upper leaves similar, gradually smaller upward on stem, narrowly elliptic, 8–15 × 1.5–3 cm. Uppermost stem leaves narrowly elliptic to linear. Capitula numerous, in a corymbiform-paniculiform synflorescence, sessile or shortly pedunculate. Involucre narrowly cylindric, 3–5 mm in diam. Phyllaries in 5 or 6 rows, yellowish green, sparsely arachnoid or glabrescent; outer phyllaries oblong, 1.5–2 × 0.5–0.8 mm, apex acute and mucronate; middle phyllaries ovate to narrowly elliptic, 2–7 × 0.8–1.5 mm, apex acute to obtuse and without a mucro; inner phyllaries narrowly elliptic to linear, 7–9 × 0.5–1 mm, apically bearded, apex obtuse. Receptacle bristles 4–5 mm. Corolla purple, 0.9–1.1 cm, tube 4–5 mm, limb 5–6 mm, lobes 3.5–4 mm. Achene (immature) ca. 2 mm, glabrous. Pappus dirty white; outer bristles 3–4 mm; inner bristles 8–9 mm. Fl. Jul–Aug.

- Forests; 1000–2300 m. Guizhou, Henan, Hubei, Shaanxi, Sichuan.
Herbs 10–70 cm tall, perennial. Roots fibrous. Stems solitary or few, erect, apically branched, usually with short sterile shoots in leaf axils. Basal and lower stem leaves petiolate; petiole 1.5–6 cm; leaf blade oblong to ovate-oblong, to 15 × 1.5–4 cm, pinnately lobed or lyrate-pinnately lobed, abaxially grayish white or green, arachnoid tomentose or glabrous, and gland-dotted, adaxially green, scabrous, and strioglabe or glabrous. Middle stem leaves shortly petiolate or sessile; leaf blade ovate to elliptic, 3–10 × 0.5–3 cm, undivided, margin entire or dentate, apex acuminate. Upper stem leaves narrowly ovate-longish elliptic to linear, 3–8 mm wide. Capitula numerous, in a corymbiform or paniculiform synflorescence. Involucre cylindric, 5–8 mm in diam. Phyllaries in 5 rows, yellowish green, apically purple, sparsely arachnoid, gland-dotted; outer phyllaries ovate, 2–3 × 1.5–2 mm, apex shortly acuminate; middle phyllaries narrowly ovate, 3–8 × 1.5–3 mm, apex shortly acuminate; middle phyllaries linear, 8–10 × 1.5–2 mm, apex obtuse. Receptacle bristles to 7 mm. Corolla purple, 1.1–1.4 cm, tube 6–8 mm, limb 5–6 mm, lobes 2.5–4 mm. Achene brown, cylindric, 3–5 mm, glabrous. Pappus white; outer bristles 2–4 mm; inner bristles 1–1.2 cm. Fl. and fr. Jul.–Sep.

Grassy or stony mountain slopes, forest meadows, fields; 1100–3200 m. Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia (Siberia, Tajikistan, Uzbekistan).


川甘风毛菊 chuan gan feng mao ju

Herbs 30–80 cm tall, perennial. Stem solitary, 2–4 mm in diam., erect, branched from middle. Lower stem leaves petiolate; petiole to 5 cm; leaf blade oblong, 4–15 × 2–6 cm, pinnatisect, both surfaces green, abaxially sparsely arachnoid pubescent and gland-dotted; lateral segments 4–10 pairs, linear-oblong, to 3 × 0.7 cm, margin entire or with a single tooth and revolute, apex mucronate. Middle and upper stem leaves gradually smaller upward on stem, base auriculate-triangular. Uppermost stem leaves linear, undivided or with 1–4 segments. Capitula numerous, in a paniculiform-corymbiform synflorescence, pedunculate. Involucre tubular to narrowly campanulate, 5–8 mm in diam. Phyllaries in ca. 4 rows, apically ± villous; outer phyllaries ovate, 2–3 × 1–1.5 mm, apex acuminate; middle phyllaries narrowly elliptic, 3–7 × 1–1.2 mm, apex acute to obtuse; inner phyllaries linear, 7–8(–11) × 0.8–1 mm, apex obtuse. Receptacle bristles 2–3 mm. Corolla pink, 8–9 mm, glabrous, tube 2.5–3.5 mm, limb 5–6 mm, lobes 2.5–3 mm. Achene brown, obconic to cylindric, 3–3.5 mm, gland-dotted, with a short crown. Pappus light brown; outer bristles 2–2.5 mm; inner bristles 8–10 mm. Fl. and fr. Aug.

Riverbanks, grassy slopes, clay soil at roadides; 2100–3600 m. Gansu, Sichuan.


秦岭风毛菊 qin ling feng mao ju


Herbs to 45 cm tall, perennial. Stem solitary, 4–5 mm in diam., erect, simple. Stem leaves petiolate, usually arranged around middle of stem; petiole 0.7–1.8 cm; leaf blade oblong, 6–20 × 2.5–6 cm, pinnatifid-partite, abaxially pale green and densely glandular hairy, adaxially green and sparsely shortly glandular hairy; lateral lobes 13–17 pairs, oblong, narrowly ovate-elliptic, or linear, 0.6–3 × 0.1–0.5 cm, usually curved downward, margin entire, apex acuminate. Capitula usually 10–14, in a laxly corymbiform synflorescence, long pedunculate. Involucre globose to campanulate, 1–1.5 cm in diam. Phyllaries in 5 or 6 rows, brownish, leathery; outer phyllaries ovate, ca. 5 × 2 mm; inner phyllaries apically black, narrowly oblong, 10–12 × ca. 2 mm, tomentose, apex long acuminate and recurved. Receptacle bristles yellowish brown, 5–6 mm. Corolla pink, 1–1.2 cm, glabrous, tube 5–6 mm, limb 5–6 mm, lobes ca. 4 mm. Achene brown, cylindric, ca. 5 mm, glabrous. Pappus yellowish white; outer bristles 3–4 mm; inner bristles ca. 8 mm. Fl. Aug–Sep, fr. Sep–Oct.

Montane meadows, margins of mixed forests; 1800–2000 m. Shaanxi (Huxian).


天水风毛菊 tian shui feng mao ju

Herbs ca. 1.5 m tall, perennial. Stem solitary, erect, apically branched, unwinged. Basal and lower stem leaves petiolate; petiole 1–2 cm; leaf blade narrowly ovate, elliptic, or oblong, 10–21 × 3–7 cm, pinnately lobed or pinnately parted, both surfaces green, abaxially glabrous, adaxially scabrid, glandular, or glabrescent, base cuneate, margin sinuate-dentate, apex acute; main segments or lobes 3–5 pairs, triangular to narrowly triangular-ovate, margin entire or dentate, apex acute and mucronate. Middle and upper stem leaves gradually smaller upward on stem, narrowly elliptic, undivided, margin dentate, apex long acuminate. Capitula 1–4, on end of branch apices, solitary or in a corymbiform synflorescence, long pedunculate. Involucre tubular-campanulate, 5–8 mm in diam. Phyllaries in 5 or 6 rows, apex acute to subobtuse; outer phyllaries triangular-ovate, ca. 5 mm; middle phyllaries narrowly elliptic, 0.6–1.5 mm; inner phyllaries narrowly elliptic to linear, 1–1.8 cm. Corolla purple, ca. 1.3 cm, tube ca. 6 mm, limb ca. 4 mm. Achene ca. 4 mm, glabrous. Pappus white or yellowish brown, outer bristles 2–5 mm; inner bristles ca. 1 mm. Fl. Aug–Sep.

Montane meadows, margins of mixed forests; 1800–2500 m. SE Gansu, S Ningxia, Shaanxi.

No specimens of Saussurea tianshuiensis or S. tianshuiensis var. huxianensis were seen by the present authors. The descriptions here are based on the original publication.

1a. Involucre tubular-campanulate, ca. 8 mm in diam.; inner phyllaries 1.3–1.8 cm .......................... 135a. var. tianshuiensis

1b. Involucre turbinate to campanulate-turbinate, 5–7 mm in diam.; inner phyllaries ca. 1 cm .......................... 135b. var. huxianensis

135a. Saussurea tianshuiensis var. tianshuiensis

天水风毛菊(原变种) tian shui feng mao ju (yuan bian zhong)
Involucre tubular-campanulate, ca. 8 mm in diam. Inner phyllaries to 1.8 cm.

- Montane meadows, forest margins, thickets; 1800–2500 m. SE Gansu, S Ningxia, SW Shaanxi.


戸县风毛菊 hu xian feng mao ju

Involucre turbinate to campanulate-turbinate, 5–7 mm in diam. Inner phyllaries to 1 cm.

- Montane meadows, forest margins, thickets; 2300–2400 m. Shaanxi (Huxian).


延翅风毛菊 yan chi feng mao ju

Herbs 60–90 cm tall, perennial. Rhizome stout, apically branched. Stem solitary, erect, apically branched, partly winged. Basal and stem leaves petiolate; petiole to 2.5 cm, winged; leaf blade elliptic to narrowly elliptic, 10–16 × 2.5–(4–6) cm, pinnately lobed to pinnatisect, abaxially light green and with articulate hairs, adaxially dark green, scabrous, and with short spinulose prickles; lateral lobes 6–10 pairs, ovate to narrowly ovate-elliptic, 1–3 × 0.2–0.5 mm, margin ciliate and dentate or entire, apex acute and mucronate. Uppermost leaves linear-subulate, 5–15 × ca. 1 mm. Capitula numerous, in a laxly paniculiform synflorescence, pedunculate, with 5–10 florets. Involucre narrowly campanulate to tubular, 4–6 mm in diam. Phyllaries in ca. 6 rows, straw-colored, apically dark purple, sparsely arachnoid; outer phyllaries ovate, 2–3 × ca. 1 mm, apex acuminate; middle phyllaries narrowly ovate-oblong, 3–7 × 1–1.5 mm, apex acute; inner phyllaries narrowly oblong to obovate, 7–9 × 1–1.5 mm, apex obtuse and barbellate. Receptacle bristles 2–5 mm. Corolla red, 7–8(–10) mm, tube 2–3 mm, limb 4–5 mm, lobes 2–2.5 mm. Achene blackish brown, 2.5–3 mm. Pappus dirty white; outer bristles ca. 2 mm; inner bristles ca. 1 cm. Fl. Aug–Sep, fr. Sep–Nov.

- Montane steppes; 2300–2600 m. W Sichuan (Kangding).

The record of this species from Yunnan (S. W. Liu, Fl. Yunnan. 13: 572. 2004) must be referable to Saussurea chrysanthemoides (which was cited as a synonym).


变裂风毛菊 bian lie feng mao ju

Herbs 40–100 cm tall, perennial. Rhizome short and stout, with many fibrous roots. Stem solitary, ca. 6 mm in diam., erect, apically branched. Lower stem leaves withered at anthesis. Middle stem leaves shortly petiolate to sessile; leaf blade narrowly elliptic, 4–18 × 2–6 mm, pinnately lobed, lyrate-pinnately lobed, or undivided and sinuate-dentate, abaxially pale green and thinly arachnoid, adaxially green and strigose, base ± decurrent, apex ± long acuminate; lateral lobes 4–14 pairs, ovato-oblong, 5–13 × 2–6 mm. Upper stem leaves narrowly elliptic to linear, base decurrent, margin dentate, teeth broadly triangular, apex long acuminate and mucronate. Uppermost stem leaves linear, margin entire. Capitula several, in a corymbiform synflorescence, pedunculate or sessile. Involucre narrowly campanulate or tubular, ca. 5 mm in diam. Phyllaries in ca. 6 rows, apically purple red, sparsely arachnoid; outer phyllaries ovate, apex acute; inner phyllaries narrowly elliptic to linear, to 9 mm, apically densely arachnoid villous, apex subobtuse. Receptacle bristles subulate, ca. 4 mm. Corolla purple, 8–11 mm, tube 4–4.5 mm, limb 4–4.5 mm, lobes ca. 3 mm. Achene grayish brown, ca. 4 mm, glabrous. Pappus pale yellowish brown; outer bristles 2–3 mm; inner bristles 8–9 mm. Fl. and fr. Sept.–Nov.

- Mountain slopes; 1900–2700 m. S Gansu, E Qinghai (Xunhua), N Sichuan.

No specimens of Saussurea variiloba were seen by the present authors, and the description here is based on the original publication and the treatments by X. Y. Wu (Fl. Loess-Plat. Sin. 5: 446. 1989) and S. W. Liu (Fl. Qinghai. 3: 481. 1996). This species is similar to S. compta but differs in the decurrent leaf bases, thinly arachnoid abaxial leaf surface, and higher number of lateral leaf lobes. The application of the name is problematic because the type material seems to be lost (Lipschitz, Rod Saussurea, 251. 1979). Lipschitz’s choice of a neotype (loc. cit.), which seems even closer to S. compta and may well be conspecific with that taxon, is not entirely in accordance with the original description.


菊状风毛菊 ju zhuang feng mao ju

Herbs 30–60 cm tall, perennial. Rootstock stout, fibrously split. Stem solitary, 2–3 mm in diam., erect, apically branched, densely covered at base with fibrous remains of petioles. Basal and lower stem leaves petiolate; petiole 4–10 cm; leaf blade ovate to elliptic, 8–12 × 2–5 cm, bipinnately divided, abaxially white, with conspicuous veins, arachnoid tomentose, and gland-
dotted, adaxially green, scabrous, sparsely strigose, and gland-dotted; primary segments 8–10 pairs, elliptic, apex obtuse and mucronate; secondary lobes 1–3 pairs, obliquely triangular-ovate. Upper stem leaves shortly petiolate to sessile, pinnatisect to pinnately lobed; lateral segments 4–6 pairs. Capitula few, in a corymbose synflorescence, long pedunculate. Involucre campanulate, 6–10 mm in diam. Phyllaries in 5 or 6 rows, arachnoid, gland-dotted; outer phyllaries ovate, 2–3 × 1–2 mm, apex acuminate; middle phyllaries narrowly elliptic, 3–10 × 1–1.5 mm, apex acute; inner phyllaries narrowly elliptic-linear, 10–12 × 1–1.5 mm, apex acute. Receptacle bristles subulate, 2–3 mm. Corolla purple, 1–1.1 cm, gland-dotted, tube 4–5 mm, limb 6–7 mm, lobes 3.5–4 mm. Achene blackish brown, 2.5–3 mm. Pap- 


Herbs 7–12 cm tall, perennial. Caudex simple, densely covered with fibrous remains of petioles. Stem solitary, 2–3 mm in diam., erect, apically branched. Lower and middle stem leaves petiolate; petiole 3–5 cm; leaf blade narrowly obovate-elliptic, 4–8 × 1.5–4.5 cm, lyrate-pinnatisect, abaxially grayish green, sparsely arachnoid tomentose, and gland-dotted, adaxially green, strigose, and gland-dotted; lateral segments 1–3 pairs, triangular-ovate, margin entire or denticulate, apex acute to obtuse; terminal segment large, margin dentate, apex obtuse. Upper stem leaves petiolate; leaf blade narrowly obovate-elliptic, 2–5 × 0.4–2 cm, undivided, margin entire or subulate-dentate. Capitula numerous, in a laxly corymbose synflorescence, pedunculate. Involucre tubular-campanulate, 7–10 mm in diam. Phyllaries in 5 or 6 rows, apically blackish, villous; outer and middle phyllaries ovate to ovate-oblong, 3–10 × 1.5–2 mm, apex obtuse to rounded; inner phyllaries narrowly ovate-elliptic, 10–15 × 1–1.5 mm, apex obtuse to acute. Receptacle bristles ca. 1.5 mm. Corolla bluish purple, 1.2–1.5 cm, gland-dotted, tube 6–7 mm, limb 5–8 mm, lobes 3.5–4 mm. Achene cylindric, ca. 3 mm, 4-ribbed, apex with a short crown. Outer pappus bristles white, 7–12 mm, barbellate; inner pappus bristles pale brown, 1–1.2 cm. Fl. and fr. Aug–Oct.


玉树风毛菊  yu shu feng mao ju

Herbs, perennial, sometimes densely caespitose, usually with developed stems, sometimes substemless. Stem usually simple, erect, rarely apically branched. Leaf blade often narrowly linear and grasslike or narrowly ovate-elliptic, narrowly elliptic, narrowly oblong, or linear, almost always undivided. Capitula (1–)1.5–3 cm in diam., usually solitary but sometimes ± numerous and in a racemiform or corymbose synflorescence. Receptacle with apiculate papillae or with subulate bristles. Corolla glabrous or gland-dotted. Anther tails usually lanate. Achene glabrous or sometimes densely sericeous, apically with a short and entire or denticulate crown. Pappus always in 2 rows; outer bristles usually scabrid.

About 24 species: C, E, and S Asia, C Europe; 21 species (14 endemic) in China.

Saussurea chrysanthemoides is apparently only known from the type collection and is clearly different from S. compta in leaf division and shape and size of the capitula.


Herbs, perennial, sometimes densely caespitose, usually with developed stems, sometimes substemless. Stem usually simple, erect, rarely apically branched. Leaf blade often narrowly linear and grasslike or narrowly ovate-elliptic, narrowly elliptic, narrowly oblong, or linear, almost always undivided. Capitula (1–)1.5–3 cm in diam., usually solitary but sometimes ± numerous and in a racemiform or corymbose synflorescence. Receptacle with short papillae or few short bristles. Anther tails usually lanate. Achene glabrous or gland-dotted. Pappus always in 2 rows; outer bristles usually scabrid.

About 24 species: C, E, and S Asia, C Europe; 21 species (14 endemic) in China.

Saussurea sect. Pycnocephala, the name used by Lipschitz (Rod Saussurea, 143. 1979) and typified with S. baicalensis, is not the earliest legitimate name for this taxon at sectional rank. Lipschitz included the type of S. sect. Lagurostemon, S. pygmaea (Jacquin) Sprengel (not present in China), in his S. sect. Pycnocephala.

1a. Leaf blade ovate, elliptic, narrowly ovate-elliptic, or oblong, 0.8–7 cm wide, margin sinuate-dentate or denticulate; capitula usually several.

2a. Capitula in a racemiform or lax corymbose synflorescence; leaf blade usually more than 2 cm wide.

3a. Stem densely leafy; leaf blade narrowly ovate-elliptic, 1–3 cm wide; capitula in a dense racemiform synflorescence, sessile or shortly pedunculate; receptacle with short papillae or few short bristles to 3 mm ......................................................... 155. S. baicalensis

3b. Stem with distant leaves; leaf blade ovate to elliptic, 2–7 cm wide; capitula in a lax corymbose or racemiform synflorescence, pedunculate; receptacle with dense bristles 5–7 mm ....................................... 161. S. sordida

2b. Capitula in a corymbose synflorescence; leaf blade 0.8–2 cm wide.

4a. Leaf blade abaxially grayish green and densely sericeous-tomentose, adaxially green .................. 158. S. souliei

4b. Leaf blade concolorous, green, abaxially not sericeous-tomentose.

5a. Stem not winged.

6a. Plants 10–50 cm tall; stem ca. 0.5 cm in diam.; involucre campanulate, less than 2 cm in diam. .......................................................... 154. S. krylovii

6b. Plants 60–70 cm tall; stem 1–1.5 cm in diam.; involucre hemispheric-campanulate, more than 2 cm in diam. ............................................ 160. S. megacephala

5b. Stem winged.

7a. Leaf blade retrorsely denticulate, apex obtuse to acute; lower stem leaves petiolate ................. 156. S. sylvatica
7b. Leaf blade coarsely sinuate-dentate, apex acuminate; lower stem leaves sessile.
8a. Capitula pedunculate; involucre 2–3.5 cm in diam.; middle stem leaves ovate to narrowly ovate ................................................................. 157. S. sobarocephala
8b. Capitula subsessile; involucre 1.5–2 cm in diam.; middle stem leaves narrowly ovate-triangluar to linear ........................................ 159. S. semifasciata
1b. Leaf blade narrowly linear or narrowly elliptic, 0.1–1 cm wide, margin entire or inconspicuously dentate; capitula solitary or rarely 2.
9a. Capitula obconic; uppermost leaves and phyllaries dark purple ........................................ 142. S. tibetica
9b. Capitula campanulate; uppermost leaves green and phyllaries straw-colored, brown, or green, sometimes purplish tinged.
10a. Phyllaries villous, with brown and white hairs.
11a. Achene glabrous; plants 7–45 cm tall ................................................................. 148. S. brunneopilosa
11b. Achene densely white villous; plants 2–6 cm tall.
12a. Leaves abaxially white, densely villous, adaxially green, sparsely pilose .............. 149. S. pubescens
12b. Leaves concolorous, grayish white, densely sericeous ...................................... 150. S. sericea
10b. Phyllaries white lanate, villous, or glabrous, without brown hairs.
13a. Leaf blade with stalked glandular hairs ......................................................... 141. S. schlachtewittii
13b. Leaf blade without stalked glandular hairs.
14a. Stem base densely covered with fibrously lacerate remains of old leaves ........ 144. S. romuleifolia
14b. Stem base not densely covered with fibrously lacerate remains of old leaves.
15a. Leaf blade concolorous, grayish white, lanate, sericeous, or pubescent.
16a. Outer phyllaries reflexed; leaf apex obtuse ............................................. 147. S. loriiformis
16b. Outer phyllaries erect and appressed; leaf apex acuminatus ....................... 152. S. leucophylla
15b. Leaf blade abaxially puberulous, lanate, or tomentose, adaxially green, glabrous or sparsely arachnoid and glabrescent.
17a. Stem densely and fluffily lanate; base of basal and lower stem leaves widened into a membranous sheath .................................................. 145. S. graminifolia
17b. Stem glabrous, appressed tomentose, or pilose; base of basal and lower stem leaves not widened into a membranous sheath.
18a. Achene densely gland-dotted; corolla white or pink; leaf blade sometimes pinnately lobed .................................................. 151. S. cinerea
18b. Achene glabrous; corolla purple; leaf blade always undivided.
19a. Leaf blade narrowly elliptic, 3–5 mm wide; involucre 1–1.2 cm in diam. ................................................................. 143. S. rockii
19b. Leaf blade narrowly linear, 1–3 mm wide; involucre 1.5–2.5 cm in diam.
20a. Leaf blade abaxially grayish white and lanate tomentose ......... 146. S. graminea
20b. Leaf blade abaxially green, glabrous or glabrescent ....... 153. S. schanginiana


腺毛风毛菊 xian mao feng mao ju

Saussurea glanduligera Schultz Bipontinus ex J. D. Hooker.

Herbs 10–20 cm tall, perennial, sometimes caespitose. Caudex branched, with several sterile leaf rosettes and flowering stems. Stem solitary, erect, simple, covered at base with remains of petioles. Rosette and basal stem leaves petiolate; petiole adaxially densely white lanate or sericeous at base; leaf blade narrowly elliptic to linear, 2–10 × 0.7–1.2 cm, both surfaces green and densely glandular hairy, margin sinuate-dentate. Middle and upper stem leaves similar to lower ones. Capitulum solitary, terminal on stem, usually surrounded by uppermost linear leaves. Involucre broadly campanulate, 2.5–3.5 cm in diam. Phyllaries in 3 or 4 rows, narrowly triangular-ovate to subulate, densely villous, apex acuminate; outer phyllaries green, 12–20 × 2–3 mm; middle and inner phyllaries purple, 1.8–2 × 0.1–0.2 cm. Corolla purplish red, 1.5–1.7(–2.5) cm, tube 7–8 mm, limb 8–9 mm, lobes 4–5 mm. Achene cylindric or obconic, 4–5 mm, 4-angled, apically with glands. Pappus pale brown or purplish; outer bristles 1–4 mm; inner bristles 1.2–1.4 cm. Fl. and fr. Jul–Sep.

Scree slopes, grasslands, rock crevices; 4700–5500 m. SW Xinjiang (Yecheng), W Xizang [NW India, Kashmir].


西藏风毛菊 xi zang feng mao ju

Herbs 8–25 cm tall, perennial. Caudex simple or few branched. Stem solitary, erect, simple. Rosette and basal leaves petiolate; leaf blade linear, 3–12 × 0.1–0.7(–1) cm, abaxially grayish green and white tomentose, adaxially green or purplish, glabrous, base attenuate, margin revolute and entire or very shallowly crenate, apex acute or obtuse. Stem leaves few, similar to basal leaves, but sessile, base amplexicaul. Uppermost stem leaves usually dark purple. Capitula solitary or 2, terminal on stem. Involucre obconic, 1.5–2 cm in diam. Phyllaries in 3 or 4 rows, dark purple, densely to sparsely villous, apex acumi-
nate; outer phyllaries narrowly triangular-ovate, 8–10 × 3–5 mm; middle phyllaries narrowly ovate-elliptic, 10–12 × 2–3 mm; inner phyllaries linear, 12–14 × 1–2 mm. Corolla purple, 0.9–1.2 cm, glabrous, tube 5–7 mm, limb 4–6 mm, lobes 2.5–4 mm. Achene narrowly obconic, 3.5–4 mm, glabrous, 5-angled, apex with a short crown. Pappus dirty white to pale yellowish brown; outer bristles 1–4 mm; inner bristles 7–11 mm. Fl. and fr. Jul–Aug. 2n = 36*.

- Alpine pastures and meadows; 3400–4700 m. Qinghai, NW Sichuan (Sêrxü), N Xizang.


显鞘风毛菊 xian qiao feng mao ju

Herbs 10–15 cm tall, perennial, caespitose. Caudex stout, branched, densely covered with blackish brown remains of petioles, sterile leaf rosettes, and flowering stems. Stem ca. 4 mm in diam., erect, simple. Rosette and basal leaves sessile, narrowly elliptic to linear, 5–9 × 0.2–0.5 cm, abaxially grayish green and densely tomentose, adaxially green or yellowish green, sparsely pilose, glabrescent, and nitid, base widened and sheathing, margin revolute and entire or denticulate, apex acute. Stem leaves few, similar to basal leaves. Uppermost stem leaves subtending and exceeding capitulum, merging into phyllaries. Capitulum solitary, terminal on stem. Involucre turbinate-campanulate, 1.5–2 cm in diam. Phyllaries in 4 or 5 rows, sparsely to densely villous, apex acuminatum; outer phyllaries narrowly ovate, 12–13 × 2.5–3 mm; middle phyllaries narrowly elliptic, 12–13(–16) × 2–3 mm; inner phyllaries broadly linear, 14–15 × 1.5–2 mm. Corolla dark purple, 0.9–1.1(–1.5) cm, tube 4–5 mm, limb 5–6 mm, lobes 2.5–3 mm. Achene brown, ca. 2.5 cm, glabrous, apex with a short crown. Pappus pale yellowish brown; outer bristles 1–3 mm; inner bristles 1–1.2 cm. Fl. and fr. Jul–Sep. 2n = 32*.

- Rocky slopes; 2700–3900 m. NW Yunnan (Gongshan, Lijiang).


鸢尾叶风毛菊 he ye feng mao ju

Herbs 10–40 cm tall, perennial, rarely almost stemless. Caudex fusiform, densely covered with many fibrous remains of leaves. Stem solitary, erect, simple. Leaves ca. 4 mm in diam., erect, simple. Rosette and basal leaves sessile, narrowly elliptic, densely white lanate. Basal leaves sessile, narrowly linear, 3–14 × 0.1–0.2 cm, abaxially grayish white and densely lanate, adaxially green and glabrous, base widened and sheathlike, margin revolute and entire, apex acuminatum. Stem leaves similar to basal leaves, reflexed, basally widened to a purple membranous sheath. Capitulum solitary, terminal on stem. Involucre subglobose, 1.8–2.5 cm in diam. Phyllaries in 4 or 5 rows, lanate; outer phyllaries narrowly ovate-elliptic, 7–15 × 2–4 mm, apically purple, apex long acuminatum and reflexed; middle phyllaries narrowly ovate-elliptic, 9–15 × 1.5–3 mm; inner phyllaries linear, 10–15 × 1–2 mm. Corolla purple, 1.1–1.2 cm, glabrous, tube 4–5 mm, limb 6–7 mm, lobes 3–3.5 mm. Achene cylindric, 3.3 cm, glabrous, apex with a short crown. Pappus pale yellowish brown; outer bristles 1–3 mm; inner bristles 1–1.2 cm. Fl. and fr. Jul–Sep. 2n = 32*.

- Grasslands on mountains, grasslands near gravel beaches; 4500–4700 m. S Xizang [Bhutan, NW India, Kashmir, Nepal].


禾叶风毛菊 he ye feng mao ju

Herbs 3–40 cm tall, perennial, caespitose, often in large clumps. Caudex much branched, apically covered with fibrous remains of old leaf bases, sterile leaf rosettes, and flowering stems. Stem erect, simple, densely sericeous or pubescent. Basal leaves sessile, narrowly linear, 3–15 × 0.1–0.2 cm, abaxially densely tomentose, adaxially sparsely pubescent to subglabrous, base sheathing stem, margin revolute and entire, apex acuminatum. Stem leaves few, gradually smaller upward on stem. Capitulum solitary, terminal on stem. Involucre campanulate, 1.5–1.8 cm in diam. Phyllaries in 4 or 5 rows, sparsely to densely to sericeous-villous; outer phyllaries narrowly ovate, 10–12 × 2–3 mm, apically reflexed or erect, apex long acuminatum; middle phyllaries narrowly ovate-elliptic, ca. 12 × 2 mm; inner phyllaries linear, ca. 12 × 1 mm. Corolla purple, 1.4–1.6 cm, sometimes gland-dotted, tube 6–8 mm, limb 6–9 mm, lobes 4–4.5 mm. Achene cylindric, 3–4 mm, glabrous, apex with a short crown. Pappus pale yellowish brown; outer bristles 1–3 mm; inner bristles 9 mm. Fl. and fr. Jul–Sep. 2n = 32*.

- Alpine and montane grasslands and steppes, meadows, thickets; 3000–5400 m. Gansu, Nei Mongol, Ningxia, Qinghai, W Sichuan, Xizang, NW Yunnan.

1a. Outer phyllaries densely lanate, apically reflexed ................................. 146a. var. graminea

1b. Outer phyllaries sparsely pubescent, apically erect ........................... 146b. var. ortholepis

146a. Saussurea graminea var. graminea

禾叶风毛菊 (原变种) he ye feng mao ju (yuan bian zhong)

Saussurea geraecocephala Diels; S. lanicaulis Handel-Mazzetti; S. poophylla Diels.
Outer phyllaries densely lanate, apically reflexed.

- Alpine and montane grasslands and steppes, meadows, thickets; 3000–4400 m. Gansu, Nei Mongol, Ningxia (Liupan Shan), W Sichuan, NW Yunnan (Ninglang, Zhongdian).


Outer phyllaries appressed, sparsely pubescent, apically erect.

- Alpine and montane steppes; 3300–5400 m. Gansu, Qinghai, W Sichuan, Xizang.

In S. W. Liu (Fl. Qinghai. 3: 465 1996) this taxon was treated under *Saussurea eopygmaea*. Plants from S Qinghai (Chinda, Nangqên, Yushu) often have several (2–4) clustered heads and usually grow taller (10–40 cm); they may deserve separate taxonomic status.


带叶风毛菊 dai ye feng mao ju

Herbs 10–15 cm tall, perennial. Caudex thick, densely covered with dark brown remains of leaf sheaths. Stem erect, simple, grayish white, lanate. Basal and stem leaves sessile, linear, 2–8 × 0.2–0.4 cm, abaxially grayish white and densely lanate, adaxially brownish or yellowish and lanate, base widened and sheathing stem, margin entire, apex obtuse. Involucre solitary, terminal on stem. Involucre campanulate, 2–3 cm in diam. Phyllaries in 4 or 5 rows, narrowly ovate-elliptic to linear, densely villous, apex acuminate; outer phyllaries ca. 8 × 2 mm, apically reflexed; middle phyllaries ca. 13 × 2 mm, apically reflexed; inner phyllaries ca. 13 × 2 mm, apex acuminate. Corolla pale reddish purple, 1.1–1.2 cm, tube 8–9 mm, limb ca. 3 mm. Achene black, ca. 2.6 mm, apically reflexed, apex with a short crown. Papus white; outer bristles ca. 2 mm; inner bristles ca. 1 cm. Fl. and fr. Jun–Sep.

- Alpine scree slopes, grassy slopes, thickets; 4100–5100 m. W Sichuan, Xizang, NW Yunnan (Dêqên, Lijiang, Zhongdian).


异色风毛菊 yi se feng mao ju

*Saussurea brunneopilosa* var. *eopygmaea* (Handel-Mazzetti) Lipschitz; *S. eopygmaea* Handel-Mazzetti.

Herbs 7–45 cm tall, perennial. Caudex branched, covered with fibrous remains of leaf sheaths, sterile leaf rosettes, and flowering stems. Stem solitary, erect, simple. Rosette and basal leaves sessile, narrowly linear, 3–10(–15) × ca. 0.1 cm, abaxially white and densely sericeous, adaxially green and glabrous, basally widened and sheathing stem, margin revolute and entire. Stem leaves similar to basal leaves. Involucre solitary, terminal on stem. Involucre broadly campanulate, ca. 2 cm in diam. Phyllaries in ca. 4 rows, apically purple, densely brown and white villous; outer phyllaries ovate-elliptic, 7–8 × 2–3 mm, apically usually reflexed, apex long acuminate; middle phyllaries narrowly ovate-elliptic, 8–10 × 2–3 mm; inner phyllaries narrowly ovate to linear, 10–12 × 1–1.5 mm. Receptacle bristles 4–5 mm. Corolla purple to pink, 1.2–1.4 cm, sometimes gland-dotted, tube 6–7 mm, limb 5–7 mm, lobes 3.5–4 mm. Achene obconic, 3.5–4 mm, glabrous, apex with a denticulate crown. Papus yellowish brown; outer bristles 1–2 mm, barbellate to plumose; inner bristles 0.9–1.1 cm. Fl. and fr. Jul–Sep. 2n = 30*.

- Alpine pastures and meadows, grassy slopes among rocks; 2900–4900 m. Gansu, Qinghai.

The plants treated as *Saussurea eopygmaea* by S. W. Liu (Fl. Qinghai. 3: 465 1996) usually lack the typical brown hairs on the phyllaries and belong to *S. graminea*. The type specimen of *S. eopygmaea* is intermediate between *S. brunneopilosa* and *S. graminea* var. *ortholepis*.


毛果风毛菊 mao guo feng mao ju

Herbs to 6 cm tall, perennial. Caudex branched, apically covered with brown remains of leaf sheaths, sterile leaf rosettes, and flowering stems. Stem erect, simple, densely white lanate. Basal leaves sessile, linear, 3–8 × 0.2–0.3 cm, abaxially densely lanate and with a conspicuous midvein, adaxially sparsely pilose, base somewhat widened, sheathing stem, and densely lanate, margin revolute, apex acute to acuminate. Stem leaves few, shorter. Capitula 1 or 2, terminal on stem. Involucre campanulate, 0.6–1.5–2 cm in diam. Phyllaries in 3 or 4 rows, densely brown villous; outer phyllaries green, narrowly ovate, ca. 10 × 2 mm, apically reflexed, apex long acuminate; inner phyllaries basally straw-colored but apically purplish red, linear, 13–15 × 1–2 mm. Corolla dark pink, 1.2–1.3 cm, tube 5–6 mm, limb ca. 7 mm, lobes ca. 3 mm. Achene cylindric, ca. 2 mm, densely white villous. Papus pale brown but basally purplish. Fl. and fr. Jul–Sep.

- Mountain slopes; ca. 4900 m. SC Xizang (Namling).

*Saussurea pubescens* is only known from the type collection.


绢毛风毛菊 juan mao feng mao ju

Herbs 2–3 cm tall, perennial. Caudex branched, covered with brown remains of leaf sheaths. Stem erect, simple, white sericeous. Leaves sessile, linear, 1–2.5 × 0.2–0.3 cm, both surfaces grayish white, densely sericeous, and with a conspicuous midvein, base somewhat widened and sheathing stem, apex acute. Infloruncle solitary, terminal on stem. Involucrale campanulate, 1–1.5 cm in diam. Phyllaries in 3 or 4 rows, densely brown villous; outer phyllaries green, narrowly ovate-elliptic, 8–10 × 2–2.5 mm, apically reflexed; middle and inner phyllaries basally yellowish green and apically purplish red, linear, 10–12 × 1–2 mm. Corolla purplish red, 0.9–1.3(–1.6) cm, usually gland-dotted, tube 4–6(–9.5) mm, often with hairs, limb 5–7 mm, lobes 3–4.5 mm. Achene cylindric, 2–3 mm, densely white villous. Papus straw-colored; outer bristles 0.5–2 mm, inner bristles basally purple, 1–1.2 cm. Fl. and fr. Jul–Sep.
• Mountain slopes, scree slopes, alpine mats; 5000–5200 m. SC Xizang [Lhunze].

The reported records of Saussurea sericea from Bhutan and India (Sikkim) (Grierson & Springate, Fl. Bhutan 2(3): 1442. 2001) do not belong here because the achenes from these collections are glabrous and not white villous.


昆仑风毛菊 kun lun feng mao ju

Saussurea pusilla Lipschitz.

Herbs 3–7(–9) cm tall, perennial, stemless or shortly stemmed. Caudex long and thin, ascending, apically branched, covered with brownish remains of leaf sheaths. Stems solitary or few, erect, simple, arachnoid tomentose. Basal leaves indistinctly petiolate; leaf blade narrowly linear, 1–7 × 0.1–0.4 cm, undivided or pinnately lobed, abaxially grayish green and arachnoid, margin revolute and entire or sparsely dentate, apex acute. Stem leaves few, shortly petiolate; petiole basally widened, semi-plexicaul; leaf blade gradually smaller upward on stem. Capitulum solitary or 2, terminal on stem. Involucre cymophyllous to campanulate, (0.6–)1–1.5 cm in diam. Phyllaries in 4 or 5 rows, pale green, densely lanate, apex acuminate; outer phyllaries ovate to narrowly ovate, ca. 5 × 2 mm; middle phyllaries narrowly ovate-elliptic, 5–10 × 2–2.5 mm; inner phyllaries narrowly elliptic to linear, 10–13 × 1.5–2 mm. Receptacle naked or with very short papillae but without bristles. Corolla pink or white, 1.5–1.7 cm, sparsely gland-dotted, tube 8–9 mm, limb 6–8 mm, lobes 2.5–3 mm. Achenes brown, cylindric, 3–5 mm, ribbed, densely gland-dotted. Pappus dirty white; outer bristles 0.5–3.5 mm, plumose; inner bristles 1.2–1.4 cm. Fl. and fr. Jul–Aug.

• Alpine stony slopes, scree slopes, grazed areas, silt or mud; 3000–3800 m. S Xinjiang (Kunlun Shan).


白叶风毛菊 bai ye feng mao ju

Herbs 3–12 cm tall, perennial, caespitose. Caudex branched, with many sterile leaf rosettes and flowering stems, covered with brown fibrous remains of old leaf sheaths. Stem erect, simple, purple and densely sericeous. Rosette and basal stem leaves sessile, narrowly linear, 3–8 × 0.1–0.2 cm, both surfaces grayish white and lanate, base widened and sheathing stem, margin revolute and entire, apex acuminate. Capitulum solitary, terminal on stem. Involucre obconic, 2.5–3.5 cm in diam. Phyllaries in 3 or 4 rows, purple, white villous; outer phyllaries ovate, 10–12 × 4–5 mm, apex acuminate to caudate; middle phyllaries narrowly ovate-elliptic, 12–15 × 2–4 mm; inner phyllaries linear, 14–15 × 1–2 mm. Corolla rose-purple, 1.6–1.8 cm, tube 9–10 mm, limb 7–9 mm, lobes 5–6 mm. Achenes brown, cylindric, ca. 2 mm, apex with a short crown. Pappus yellowish brown; outer bristles 1–3 mm; inner bristles 1.1–1.5 cm. Fl. and fr. Jul–Aug.

• Alpine pastures and meadows, mountain slopes; 2600–4000 m. Xinjiang [Kazakhstan, Kyrgyzstan, W Mongolia, Russia (Siberia), Tajikistan].


暗苞风毛菊 an bao feng mao ju


Herbs 4–10–34 cm tall, perennial. Stems solitary or few, erect, simple. Leaves sessile, narrowly elliptic to linear, 4–20 × 0.1–0.5(–1) cm, both surfaces dark green and sparsely villous to subglabrous, margin entire or sparsely denticulate, apex acute to acuminate. Capitulum solitary, terminal on stem. Involucre campanulate, 1–2 cm in diam. Phyllaries in ca. 3 rows, villous, subsimilar in length; outer and middle phyllaries ovate-triangular to narrowly elliptic, 14–15 × 3–4 mm; inner phyllaries narrowly elliptic to linear, 14–15 × 1–1.5 mm. Receptacle bristles 3–5 mm. Corolla violet, 1.4–1.6 cm, tube 7–9(–10) mm, limb 6–7 mm, lobes 3–5 mm. Achenes brown, cylindric, 5–6 mm, ribbed, apex with a short crown. Pappus dirty white to light brown; outer bristles 1–4 mm; inner bristles 1–1.2 cm. Fl. and fr. Jul–Aug. 2n = 36.

Alpine meadows, tundra, scree and rocky slopes; 2100–2800 m. N Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia (Siberia)].


阿尔泰风毛菊 a er tai feng mao ju

Herbs 10–50 cm tall, perennial. Stem solitary, erect, simple. Basal and lower stem leaves shortly petiolate; leaf blade narrowly elliptic to linear, 10–20 × 0.6–1.5 cm, both surfaces green and scabrid, margin sinuate-dentate, apex acuminate. Middle and upper stem leaves sessile, gradually smaller upward on stem. Capitulum (1 or)2–4, in a corymbiform synflorescence, shortly pedunculate. Involucre campanulate, to 2 cm in diam. Phyllaries in ca. 3 rows; outer phyllaries ovate to narrowly elliptic; inner phyllaries narrowly elliptic, apex long acuminate. Receptacle bristles to 5 mm. Corolla dirty violet, 1.3–1.6 cm, tube 7–8 mm, limb 5–6 mm, lobes ca. 3 mm. Achenes brown, cylindric, (3–)5–7 mm. Pappus dirty white; outer bristles 1–2 mm; inner bristles 1–1.1 cm. Fl. and fr. Jul–Sep.

• Alpine meadows, forest margins; 2300–2800 m. N Xinjiang [Kazakhstan, Mongolia, Russia (W Siberia)].


大头风毛菊 da tou feng mao ju


Herbs 30–45(–60) cm tall, perennial. Stem solitary, 0.8–1.5 cm in diam., erect, simple, covered at base with lacerate remains of leaf sheaths. Leaves shortly petiolate; leaf blade narrowly ovate to narrowly elliptic, 10–20 × 1–3 cm, both surfaces
green and scabrous, abaxially glabrous, adaxially sparsely villous to subglabrous, base cuneate, margin dentate, apex acute to acuminate. Capitula 7–16, in a dense racemiform 10–25 cm synflorescence, sessile or shortly pedunculate, subtended by narrowly triangular-ovate herbaceous bracts. Involucre campanulate, 1.5–2.5(–3) cm in diam. Phyllaries in 3 or 4 rows, green but dark on midvein and apically, narrowly triangular-ovate, 1.5–2.2 × 0.2–0.4 cm, villous, apex acute to acuminate. Receptacle with apiculate papillae or short to 3 mm bristles. Corolla purple, 1.5–1.7 cm, tube 8–9 mm, limb 7–8 mm, lobes 4–4.5 mm. Achene brown, cylindrical, 5–6 mm, ribbed, apex with a short crown. Pappus straw-colored; outer bristles 2–5 mm; inner bristles 1.3–1.4 cm. Fl. and fr. Jun–Jul. 2n = 26, 36.

Alpine meadows, around exposed ledges and boulders; 2000–3200 m. Hebei (Dongling Shan, Xiaowutai Shan) [Mongolia, Russia (Siberia)].

Material of *Saussurea baikalensis* from both known localities in China has receptacle bristles to 3 mm.


林生风毛菊 lin sheng feng mao ju

*Saussurea hsiao wastewaterhannensis* F. H. Chen; *S. sylvatica* var. *hsiao wastewaterhannensis* (F. H. Chen) Lipschitz.

Herbs 20–80 cm tall, perennial. Stem 2–4 mm in diam., erect, simple or apically branched, with dentate wings, covered at base with fibrous remains of petioles. Lower stem leaves petiolate; petiole 1–5 cm; leaf blade narrowly elliptic, obovate, or narrowly ovate, (3–)7–13 × 0.8–2 cm, abaxially glaucous, adaxially green and glabrous or sparsely pubescent, base cuneate, margin denticulate, apex rounded to subacute. Middle and upper stem leaves sessile, narrowly ovate-elliptic, 3.5–12 × 0.5–1.5 cm, base decurrent, apex acute. Uppermost stem leaves narrowly triangular to subulate-linear, 2–4 × 0.1–0.5 cm. Capitula 1–6, in a ± condensed corymiform synflorescence, sessile to long pedunculate. Involucre campanulate, 1.2–2 cm in diam. Phyllaries in 4 or 5 rows, blackish purple, pilose-sericeous to glabrescent, apex acute to acuminate; outer phyllaries ovate-triangular, 6–7 × 2–4 mm; middle and inner phyllaries narrowly triangular-ovate to linear, 7−15 × 2–3 cm. Corolla purple, 1.5–1.6 cm, tube 8–8.5 mm, limb 7–7.5 mm, lobes 3–3.5 mm. Achene brown, cylindrical, 5–5.5 mm, 4 or 5-angled, glabrous, with a short crown. Pappus brown; outer bristles (2–)3–5 mm; inner bristles 1.2–1.3 cm. Fl. and fr. Jun–Sep. 2n = 30*.

- Alpine and montane grasslands, thickets, forest margins; 1900–4500 m. Gansu, Hebei (Xiaowutai Shan), Qinghai, Shaanxi, Shanxi, Sichuan.


昂头风毛菊 ang tou feng mao ju

Herbs 20–60 cm tall, perennial. Stem solitary, erect, simple or apically branched, winged, covered at base with numerous fibrous remains of old petioles. Basal and lower stem leaves sessile, ovate to oblanceolate, 8–12 × 1–2 cm, both surfaces green and glabrous, base deciduous, margin serrulate, apex acute. Middle and upper stem leaves ovate to narrowly ovate, gradually smaller upward on stem, 4–7 × 1–1.5 cm, apex long acuminate. Capitula 2–11, in a corymiform synflorescence, sessile to pedunculate. Involucre campanulate to hemispheric, 2–3.5 cm in diam. Phyllaries in 4 or 5 rows, usually black, apex acuminate; outer phyllaries narrowly ovate-triangular, 10–15 × 2–3(–5) mm; middle and inner phyllaries narrowly elliptic to linear, (10–)15–20 × 1–3(–4) mm. Corolla purple, 1.6–1.7 cm, glabrous, tube 9–10 mm, limb 5–6 mm, lobes 3.5–4 mm. Achene cylindrical, 5–6 mm, ribbed, apex with a short crown. Pappus pale yellowish brown; outer bristles 1–5 mm, scabrid; inner bristles ca. 1.2 cm. Fl. and fr. Jul–Aug. 2n = 34*.

- Forest margins, grasslands on mountain slopes; 1900–3600 m. Hebei, Henan, Shaanxi, Shanxi, Sichuan.

*Saussurea sobarocephala* has often been confused with *S. sylvatica*.


披针叶风毛菊 pi zhen ye feng mao ju

Herbs 35–55 cm tall, perennial. Stem solitary, 3–5 mm in diam., erect, simple, winged, covered at base with lacerate remains of leaf sheaths. Leaves sessile, narrowly ovate-elliptic, 7–10 × 1.5–2 cm, abaxially grayish white and sericeous-tomentose, adaxially dark green and pubescent, base decurrent, margin dentate, apex acute. Capitula 10–20(–30), in a subglobose, densely congested corymiform synflorescence 4–5 cm in diam., shortly pedunculate. Involucre campanulate to globose, 0.8–1.2 cm in diam. Phyllaries in 6–8 rows, basally brown to straw-colored, apically green, villous, apex acute to acuminate; outer phyllaries narrowly ovate-triangular, 4–6 × ca. 2 mm; middle phyllaries narrowly ovate-elliptic, 6–8 × 2–3 mm; inner phyllaries linear, 8–12 × 1.5–2 mm. Corolla purple, ca. 1.2 cm, tube ca. 6 mm, limb ca. 6 mm, lobes ca. 3 mm. Pappus dirty white; inner bristles ca. 8 mm. Fl. Aug.

- W Sichuan (Kangding).


锯叶风毛菊 ju ye feng mao ju

Herbs 15–100 cm tall, perennial. Stem solitary, 6–8 mm in diam., erect, simple or apically branched, with sinuate-lobate, dentate wings, covered at base with fibrous remains of leaf sheaths. Leaves sessile, narrowly ovate-triangular, 5–18 × 0.8–2 cm, abaxially green and glabrous, base decurrent, margin sinuate-lobate and doubly dentate, apex acute to long acuminate. Capitula 8–25, in a basally lax but apically clustered corymiform synflorescence, long pedunculate to subsessile. Involucre broadly campanulate to subglobose, 1.5–2 cm in diam. Phyllaries in 4 or 5 rows, basally brown or straw-colored, apically green with a blackish to black margin, pilose, apex acute; outer phyllaries narrowly triangular-ovate, 8–10 × 2–3 mm; middle phyllaries narrowly elliptic, 10–13 × 1.5–2 mm; inner phyllaries linear, 13–14 × 1–1.5 mm. Corolla red, 1.1–1.5 cm, tube 6–9 mm, limb 5–6 mm, lobes 3.5–4 mm. Achene dark brown, cylindrical, ca. 3 mm, obtusely 4-angled, glabrous, apex with a short crown.
Pappus light brown; outer bristles ca. 2 mm; inner bristles 1–1.2 cm. Fl. and fr. Aug–Sep.

- Forests, thickets, near rivers; 3800–4800 m. Gansu, Qinghai, Sichuan, NW Yunnan (Déqên, Zhongdian).


察隅风毛菊 cha yu feng mao ju

Herbs 60–70 cm tall, perennial. Stem solitary, 1–1.7 cm in diam. at base, erect, simple, hollow. Basal and lower stem leaves petiolate; petiole 1–6 cm; leaf blade narrowly elliptic, 13–16 × 1–2.5 cm, both surfaces green and glabrous, base decurrent, margin denticulate or entire, apex acute. Middle and upper stem leaves sessile, gradually smaller upward on stem, 4–9 × 0.2–1.2 cm, margin denticulate or entire, apex acuminate. Uppermost stem leaves linear, 10–15 × ca. 1 mm. Capitula 3 or 4, in a clustered corymbiform synflorescence, sessile. Involucre globose, 2–2.5 cm in diam. Phyllaries in 6 or 7 rows, brown, densely villous, apex acuminate; outer phyllaries triangular-oblong, 9–10 × 2.8–3 mm; middle phyllaries ovate-oblong, 8–10 × 2.5–2.8 mm; inner phyllaries narrowly ovate, 14–15 × ca. 2 mm. Receptacle bristles yellowish brown, 5–6 mm. Corolla dark purple, 1.4–1.5 cm, glabrous, tube ca. 7 mm, limb 7–8 mm, lobes ca. 3 mm. Achene brown, cylindrical, 2.8–3(–4) × 0.5–1 mm, glabrous. Pappus yellowish white; outer bristles 5–6 mm; inner bristles 1.1–1.4 cm. Fl. Aug.

- Juniperus forests; ca. 3500 m. SE Xizang (Zayü).

Saussurea megacephala is only known from the type and is very close to S. semifasciata, from which it differs by its petiolate lower leaves, non-decurrent stem leaves, and sessile and glomerate capitula.


污花风毛菊 wu hua feng mao ju

Saussurea pyneoccephala Ledebour var. sordida (Karelin & Kirilov) Herder; S. russowii C. Winkler; S. sordida var. oilgocephala C. Winkler ex Lipschitz; S. tuoliensis K. M. Shen.

Herbs 40–100 cm tall, perennial. Stem solitary, erect, simple or apically branched, covered at base with fibrous remains of leaf sheaths. Lower stem leaves petiolate; petiole to 10 cm, winged; leaf blade ovate to narrowly ovate-elliptic, 15–40 × 2–7 cm, both surfaces green, abaxially pilose but glabrescent, adaxially scabrid, margin serrulate-dentate, apex acuminate. Middle and upper stem leaves sessile, elliptic to narrowly ovate-elliptic, gradually smaller upward on stem. Capitula solitary to numerous, in a lax corymbiform or racemiform synflorescence, pedunculate. Involucre broadly campanulate, 2–2.5 cm in diam. Phyllaries in 4 or 5 rows, blackish brown or straw-colored with a dark margin, triangular-ovate to narrowly triangular-ovate, pilose but later glabrescent, apex acuminate; outer phyllaries 9–12 × 3–4 mm; middle phyllaries narrowly elliptic, 13–15 × 2–3 mm; inner phyllaries 15–18 × 1.5–2 mm. Corolla purple, 1.2–1.5 cm, tube 5–8 mm, limb 5–9 mm, lobes 2–4 mm. Achene brown with dark spots, cylindrical, 5–6 mm, obtusely 4- or 5-angled, glabrous, apex with a short crown. Pappus straw-colored; outer bristles 1–5 mm; inner bristles 1–1.5 cm. Fl. and fr. Jul–Sep.

- Meadows, gravelly mountain slopes; 2000–2800 m. C and NW Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].

According to Lipschitz (Fl. URSS 27: 402. 1962), Saussurea sordida is a widespread and very variable taxon, including larger plants from China that had been described as S. russowii. Following this wide concept, we also include S. tuoliensis here, which perfectly matches S. russowii.


羽裂风毛菊组 yu lie feng mao ju zu

Aplotaxis Candolle; Cyathidium Lindley ex Royle; Eriostemon Lessing (1832), not Smith (1798).

Herbs, perennial, stemless, substemless, or with developed leafy or scapiform stems. Leaves usually pinnately dentate, pinnately lobed, or pinnatisect, rarely undivided. Capitula usually relatively large, solitary, sometimes 2 or 3 in center of leaf rosette or terminal on stem, rarely numerous in a clustered corymbiform synflorescence. Phyllaries in many rows, imbricate, often subequal in length. Receptacle usually with subulate bristles, rarely naked. Anther tails usually lanate or villous. Achene ribbed, smooth or transversely rugose, glabrous. Pappus usually in 2 rows, white, straw-colored, or brown; outer bristles short, deciduous, scabrid, rarely plumose or barbellate, rarely lacking; inner bristles long, plumose.

About 44 species: Bhutan, China, NE and NW India, Kashmir, Nepal; 36 species (27 endemic) in China.

Saussurea sect. Strictae occurs mainly on the Qinghai-Xizang Plateau and in the Hengduan Shan region.

Saussurea sect. Cyathidium, the name used by Lipschitz (Rod Saussurea, 154. 1979) for both stemless and cauliferous species with predominantly pinnately divided and often dandelion-like leaves, is not the earliest legitimate name for this taxon at sectional rank. Saussurea taraxacolia, the type species of the genus Cyathidium, was included in S. sect. Strictae by C. B. Clarke (loc. cit.) and chosen as a lectotype of that section by Lipschitz (loc. cit.: 155). Saussurea andersonii, the lectotype species of S. sect. Depressae, is considered here to be a member of S. sect. Strictae as well. Saussurea sect. Acaules, lectotypified by Kitamura (Acta Phytotax. Geobot. 24: 22. 1969) with S. stoliczkae (= S. andryaloides), is also a synonym of this section. See also the discussion under S. sect. Gymnocline.

1a. Plants stemless or shortly stemmed, less than 10 cm tall; capitula usually in center of leaf rosette, exceeded by leaves.

2a. Leaf blade undivided with margin entire, shallowly crenate, or sinuate-dentate.

3a. Leaf blade 1–4 cm; involucre narrowly campanulate, 1–1.5 cm in diam. ................................. 185. S. dschungdienensis
3b. Leaf blade 3–11 cm; involucre broadly campanulate, 2–3.5 cm in diam.

4a. Leaf blade narrowly elliptic to linear, 0.4–1.2 cm wide; inner phyllaries to 1.5 cm; achene transversely rugose

4b. Leaf blade elliptic, 1–3.5 cm wide; inner phyllaries 2–2.5 cm; achene smooth

2b. Leaf blade bipinnatisect, pinnatisect, pinnately lobed, or pinnately dentate.

5a. Leaf blade bipinnatisect or pinnatisect with split segments.

6a. Leaf blade narrowly elliptic, 6–15 cm; involucre campanulate, 2–2.5 cm in diam. 1.80. S. colpodes

6b. Leaf blade narrowly elliptic-linear, 3–5 cm; involucre cylindric to narrowly campanulate, 1–1.5 cm in diam. 1.186. S. laevenkoana

5b. Leaf blade simply pinnatisect, pinnately lobed to pinnately dentate, or lyrate-pinnately lobed.

7a. Leaf blade adaxially grayish green, ± arachnoid tomentose.

8a. Involucre 2–3 cm in diam.; receptacle without bristles; leaf blade obovate-oblong to elliptic, 2–4 cm wide; phyllaries whitish, with a purple mucro

8b. Involucre 1–2 cm in diam.; receptacle with bristles; leaf blade narrowly ovate-elliptic, 0.3–1.5 cm wide; phyllaries purplish red, without a purple mucro

7b. Leaf blade adaxially green, glabrous, scabrid and strigose, or sparsely arachnoid.

9a. Capitula several in a clustered or lax corymbiform synflorescence; involucre ovoid or campanulate, 0.5–1.2 cm in diam.

10a. Plants usually stemless, 1–5 cm tall; leaf blade narrowly elliptic to linear, 0.5–1.5 cm wide; capitula usually 3–10, in a clustered synflorescence; pappus brown, in 1 row 1.183. S. salvinensis

10b. Plants with a ± developed stem, 5–10(–15) cm tall; leaf blade obovate to narrowly obovate, 1–3 cm wide; capitula usually 2–5, in a lax synflorescence; pappus dirty white, in 2 rows 1.191. S. nimborum

9b. Capitula always solitary; involucre usually campanulate, 1–4 cm in diam.

11a. Leaf blade abaxially pale green, subglabrous, sparsely pilose on veins and margin

11b. Leaf blade abaxially grayish green or grayish white, densely tomentose or thinly to moderately lanate.

12a. Outer pappus bristles 8–11 mm, plumose; leaf blade abaxially thinly to moderately lanate

12b. Outer pappus bristles 1–6 mm, scabrid; leaf blade abaxially densely tomentose.

13a. Leaf blade adaxially smooth, sparsely arachnoid

13b. Leaf blade adaxially scabrid, strigose or glandular, or glabrous but not arachnoid.

14a. Leaf blade linear, 0.3–0.8 cm wide.

15a. Leaf blade pinnately lobed or pinnately dentate; involucre broadly campanulate, 2–2.5 cm in diam. 1.189. S. purpurascens

15b. Leaf blade runcinately pinnatisect; involucre narrowly campanulate, 0.6–1 cm in diam. 1.190. S. nyalamensis

14b. Leaf blade narrowly elliptic, oblong, or obovate, 0.8–4 cm wide.

16a. Leaf blade narrowly elliptic, oblong, or broadly linear, pinnatisect; leaf blade lateral lobes 8–20 pairs.

17a. Achene smooth; leaf blade 4–30 × 1–4 cm; leaf blade lateral lobes 8–20 pairs; involucre 2–4 cm in diam.; phyllaries sparsely pilose

17b. Achene transversely rugose; leaf blade 3–18 × 0.8–2.5 cm; leaf blade lateral lobes 8–12 pairs; involucre 1–3 cm in diam.; phyllaries glabrous

16b. Leaf blade obovate or narrowly obovate, lyrate or pinnately lobed; leaf blade lateral lobes 3–8 pairs.

18a. Plants stemless, to 3 cm tall; leaf blade obovate-elliptic, 1.5–4.5 × 0.8–1.5 cm 1.192. S. ceterach

18b. Plants stemless or shortly stemmed, 3–10 cm tall; leaf blade obovate to narrowly obovate, 3–12 × 1–3 cm.

19a. Leaf blade shallowly pinnately lobed; involucre obovate, 0.5–1.2 cm in diam. 1.191. S. nimborum

19b. Leaf blade lyrate-pinnately lobed; involucre campanulate, 1.2–1.5 cm in diam. 1.196. S. brachylepis

1b. Plants with well-developed flowering stems, usually more than 10 cm tall; capitula usually solitary and terminal on stem or sometimes several in a corymbiform or paniculiform synflorescence.

20a. Capitula several, in a paniculiform or corymbiform synflorescence.
21a. Capitula 4–15, in a paniculiform synflorescence, pedunculate; leaf blade green and glabrous on both surfaces ................................................................................................................. 162. S. incisa

21b. Capitula 2–20, clustered in corymbiform synflorescence, subsessile; leaf blade abaxially grayish white and densely tomentose, adaxially green.

22a. Capitula 2–5(–8); involucre campanulate, 1–1.5 cm in diam.; phyllaries subglabrous, inner ones 1.3–1.6 cm ..................................................................................................................... 181. S. lingulata

22b. Capitula 3–20; involucre ovoid to globose, 0.6–1 cm in diam.; phyllaries sparsely villous, inner ones to 1 cm ....................................................................................................................... 182. S. przewalskii

20b. Capitulum solitary, or rarely 2 or 3, terminal on stem.

23a. Leaf blade green on both surfaces, glabrous or subglabrous.

24a. Leaf blade pinnatisect, lateral segments linear, margin entire ........................................ 163. S. henryi

24b. Leaf blade runcinate-pinnately lobed, lateral lobes narrowly triangular-falcate, semiobtuse, or triangular, margin denticulate.

25a. Stem and petioles subglabrous or whitish pubescent; leaf blade adaxially subglabrous; involucre 0.8–1.7 cm in diam.; outer pappus bristles plumose ........................................ 164. S. eriostemon

25b. Stem and petioles densely covered with pale brown multicellular articulate hairs; leaf blade adaxially scabrid, strigose; involucre 1.5–2.5 cm in diam.; outer pappus bristles scabrid ....................................................................................................................... 165. S. scabrida

23b. Leaf blade abaxially grayish green or grayish white and densely tomentose, arachnoid, or lanate, adaxially green and glabrous, subglabrous, or sparsely arachnoid.

26a. Leaf blade not pinnately lobed or bipinnatisect but rather simply pinnately lobed, pinnatisect, or rarely undivided.

27a. Leaf blade undivided with margin entire, sinuate, denticulate, or dentate.

28a. Leaf blade linear to narrowly elliptic, less than 1 cm wide (if wider then leaf blade pinnatisect) ........................................ 168. S. yunnanensis

28b. Leaf blade elliptic, ovate, or oblong, 1–2 cm wide.

29a. Outer phyllaries reflexed; corolla ca. 2 cm ........................................................................ 173. S. paleacea

29b. Outer phyllaries not reflexed; corolla ca. 1.5 cm ........................................................................ 174. S. limprichtii

27b. Leaf blade runcinate-pinnately lobed, or pinnatisect.

30a. Leaf blade adaxially grayish green and ± arachnoid tomentose, lyrate pinnately lobed; receptacle without bristles; phyllaries whitish, densely arachnoid tomentose, with purple mucro ......................................................................................... 178. S. porphyroleuca

30b. Leaf blade adaxially green and glabrous, pubescent, glandular, or strigose, pinnately lobed to pinnatisect; receptacle with bristles; phyllaries not arachnoid, without purple mucro.

31a. Leaf blade adaxially glabrous or subglabrous.

32a. Stem ca. 5 mm in diam. at base; capitula large; involucre 2.5–3.5 cm in diam.; phyllaries densely villous ........................................ 177. S. wardii

32b. Stem 2–3 mm in diam. at base; capitula small; involucre 1.5–2.5 cm in diam.; phyllaries sparsely villous or glabrous.

33a. Leaf blade runcinate pinnatisect; leaf blade segments narrowly triangular-linear, strongly reclinate, margin revolute 168. S. yunnanensis

33b. Leaf blade pinnatisect lobed; leaf blade lobes obliquely triangular, patent or recurved, margin not revolute.

34a. Leaf blade 5–15 × 1–2.5 cm; leaf blade lobes 5–7 pairs ......................................................................................... 166. S. taraxacifolia

34b. Leaf blade 2.6 × 0.6–1.7 cm; leaf blade lobes 2–5 pairs ......................................................................................... 169. S. leptolepis

31b. Leaf blade adaxially scabrid, pubescent, glandular hairy, strigose, or sparsely arachnoid.

35a. Outer phyllaries usually reflexed, apical part green and herbaceous.

36a. Leaf blade lyrate, pinnately lobed, or subpinnatisect; involucre 1.5–2 cm in diam.; basal leaves usually shorter than flowering stem ................................................................................................................. 175. S. semilyrata

36b. Leaf blade pinnatisect; segments coarsely dentate; involucre 2–3.5 cm in diam.; basal leaves usually longer than flowering stem ................................. 179. S. pachyneura
35b. Outer phyllaries erect, appressed, apical part straw-colored or brownish to blackish purple and not herbaceous.

37a. Leaf blade runcinate-pinnately lobed, sometimes lyrate; leaf blade lobes 3–8 pairs, obliquely triangular; capitula large; involucre 2.5–3.5 cm; outer phyllaries narrowly triangular-subulate ...................................................... 176. S. subulissquama

37b. Leaf blade pinnatisect; leaf blade lobes 7–13 pairs, narrowly oblong or narrowly triangular-ovate; capitula medium-sized; involucre 1–2.5 cm in diam.; outer phyllaries narrowly ovate-triangular.

38a. Lateral leaf blade lobes 7–13 pairs, narrowly oblong, apex rounded and mucronate .................................................. 170. S. polypodioides

38b. Lateral leaf blade lobes 10–20 pairs, narrowly triangular-ovate, apex acuminate ........................................... 171. S. coriacea


锐裂风毛菊  rui lie feng mao ju

Herbs 15–20 cm tall, perennial. Stem solitary, 1–2 mm in diam., erect, branched. Basal and lower stem leaves long petiole; leaf blade ovate-triangular, 4–10 × 3–6 cm, abaxially pale green and glabrous, adaxially dark green, base cordate-hastate, margin incised-dentate, teeth wide and triangular, apex acuminate. Upper stem leaves narrowly elliptic to linear, 1–3 × 0.2–0.8 cm. Capitula 4–15, in a paniculiform synflorescence, pedunculate. Involucre ovoid to obconic, 5–10 mm in diam. Phyllaries in ca. 4 rows, glabrous or sparsely arachnoid near margin, apex acuminate; outer phyllaries narrowly ovate, 2–4 × 0.5–1.5 mm; middle phyllaries narrowly elliptic, 4–7 × 1–1.5 mm; inner phyllaries linear, 7–9 × 0.5–1 mm, with conspicuous green veins. Corolla 0.9–1.1 cm, tube 4–5 mm, limb 4–5 mm, lobes 3–3.5 mm. Achene grayish brown with blackish dots, cylindrical, 4–5 mm, glabrous. Pappus white; outer bristles 1–3 mm; inner bristles 7–8 mm. Fl. and fr. Aug–Oct.

● Meadows, thickets. Hebei (Changli, Xiaowutai Shan).


巴东风毛菊  ba dong feng mao ju

Herbs 12–80 cm tall, perennial. Stem solitary, 1–2 mm in diam., erect, usually simple. Basal and lower stem leaves petiolate; petiole 2–9 cm; leaf blade narrowly elliptic, 5–12.5 × 2–4.5 cm, pinnatisect, both surfaces green, abaxially glabrous, adaxially sparsely strigose; lateral segments 6–11 pairs, linear, 10–20 × 3–6 mm, margin revolute and entire, apex acute and mucronate; terminal segment linear, 5–20 × 2–3 mm. Middle stem leaves much smaller and with fewer segments. Upper stem leaves linear-filiform, 1–2 × 0.2–0.4 mm, margin entire, apex claduate. Capitulum solitary, sometimes 2 or 3, terminal on stem. Involucre obconic, 1.3–1.6 cm in diam. Phyllaries in ca. 5 rows, sparsely arachnoid tomentose, glabrescent, apex long acuminate; outer phyllaries narrowly ovate-elliptic, 5–6 × 1–2 mm, basally straw-colored, apically green; middle phyllaries narrowly ovate-elliptic, 8–13 × 1.5–2 mm; inner phyllaries narrowly elliptic, 12–14 × 1–1.5 mm, apically brown. Corolla purple, 1.4–1.6 cm, tube 7–8 mm, limb 6.5–7 mm, lobes 4.5–5 mm. Achene blackish brown, obconic, ca. 3 mm, glabrous. Pappus straw-colored; outer bristles 2–4 mm, scabrid, sometimes very few; inner bristles 1–1.1 cm. Fl. and fr. Jul–Aug.


164. Saussurea eriostemon Wallich ex C. B. Clarke, Compos. Ind. 229. 1876.

尼泊尔风毛菊  ni bo er feng mao ju


Herbs 20–30 cm tall, perennial. Stems solitary or 2, erect, simple, covered at base with fibrously lacerate remains of petioles. Basal and lower stem leaves petiolate; petiole 1–7 cm; leaf blade oblong to narrowly obovate-elliptic, 4–18 × 1–3 cm, runcinate-pinnately lobed, abaxially pale green, subglabrous, adaxially green; lateral lobes 4–10 pairs, narrowly triangular to semiobtuse, 3–15 × 3–18 mm, margin mucronate-dentate, apex acute. Middle and upper stem leaves 1 or 2, smaller than lower leaves. Capitulum solitary, terminal on stem. Involucre campanulate, 0.8–1.7 cm in diam. Phyllaries in 5 or 6 rows, apically blackish green to purple, apex acute to acuminate; outer phyllaries narrowly triangular-ovate, ca. 10 × 4 mm; inner phyllaries ca. 1.9 × 0.3 cm. Receptacle bristles 5–11 mm. Corolla purple, 1.8–2.3 cm, lobes 3.5–6 mm. Achene cylindric, 3.5–4.5–6 mm, ribbed, smooth, glabrous, apex with a short crown. Pappus brown; outer bristles 2–3(–6) mm, plumose; inner bristles 1.3–1.8 cm. Fl. and fr. Aug–Oct. 2n = 32.

Alpine grasslands, thickets, river valleys, by trails; 3500–4200 m. S Xizang (Yadong) [Bhutan, India (Sikkim), Nepal].

Saussurea nepalensis is illegitimate because Sprengel cited Centaurea taraxacifolia in synonymy but did not take up the epithet, which was at that time still available in Saussurea. Candolle also should have used the earlier epithet, “taraxacifolia,” when he transferred the name to Aplotaxis. When C. B. Clarke validated the nomen nudum S. eriostemon by Wallich, another nomen nudum, S. taraxacifolia, used for a different taxon by Wallich, had already been validated by Candolle, so the earliest epithet “taraxacifolia” was no longer available in Saussurea.

糙毛风毛菊 cao mao feng mao ju

Saussurea leontodon Dunn; S. pseudoleontodon F. H. Chen.

Herbs 30–60 cm tall, perennial. Stem solitary, erect, simple, densely covered with pale brown articulate hairs. Basal and lower stem leaves shortly petiolate; leaf blade narrowly elliptic, 10–23 × 1.5–4.5 cm, green, concorolarious, scabrid, with multicellular articulate hairs, base cuneate-attenuate, margin runcinate-pinnately lobed; lateral lobes 3–12 pairs, triangular, margin mucronate-dentate. Middle and upper stem leaves gradually smaller upward on stem. Uppermost stem leaves sessile, usually narrowly ovate-elliptic, undivided, base semiamplexicaul, margin dentate. Capitulum solitary, terminal on stem. Involucre campanulate, 1.5–2.5 cm in diam. Phyllaries in ca. 5 rows, densely villous or with articulate hairs, apex acuminatus; outer phyllaries narrowly triangular-ovate, ca. 16 × 3–4 mm; middle phyllaries narrowly elliptic, ca. 15 × 3.5 mm; inner phyllaries linear, ca. 18 × 1–1.5 mm. Corolla purple, ca. 1.1 cm, tube ca. 8 mm, limb ca. 3 mm. Achene brown, cylindrical, ca. 6 mm, glabrous. Pappus pale brown; outer bristles 3.5–5 mm, scabrid; inner bristles ca. 1.3 cm. Fl. and fr. Jul–Aug.

166. Saussurea taraxacifolia (Lindley ex Royle) Wallich ex Candolle, Prodr. 6: 532. 1838.

蒲公英风毛菊 pu gong ying feng mao ju


Herbs 15–50 cm tall, perennial. Stem solitary, erect, simple. Basal and lower stem leaves petiolate; petiole 4–6 cm; leaf blade narrowly elliptic or narrowly obovate, 5–15 × 1–2.5 cm, runcinate, pinnately lobed to pinnatisect, abaxially grayish green and densely tomentose, adaxially green and glabrous; lateral lobes 5–7 pairs, triangular-ovate, 6–10 × 4–10 mm, reclinatus, margin entire or dentate with 1 or 2 teeth on distal side, apex acute to obtuse and mucronatus; terminal lobes triangular, 1–1.5(–2.5) × 0.5–1.5 cm. Upper stem leaves narrowly elliptic to linear, margin dentate. Capitulum usually solitary, terminal on stem. Involucre campanulate, (1–)2.5–3 cm in diam. Phyllaries in 4 or 5 rows, sparsely pilose, apically blackish green, apex long acuminate; outer phyllaries narrowly ovate-elliptic, 9–10 × 1–2 mm; middle phyllaries narrowly ovate-linear, 10–14 × 1–2 mm; inner phyllaries broadly linear, 14–16 × 1–1.5 mm. Corolla purple, 1.5–1.6 cm, tube 7–8 mm, limb 7–8 mm, lobes 4–5 mm. Achene cylindric, 4–5.5 mm, glabrous, apex with a small crown. Pappus pale brown; outer bristles 2–3 mm, scabrid; inner bristles 1.1–1.2 cm. Fl. and fr. Jul–Sep.

Thickets; 3800–4700 m. Xizang, NW Yunnan (Gongshan) [Bhutan, NE and NW India, Kashmir, Nepal].


百裂风毛菊 bai lie feng mao ju

Saussurea leveillei F. H. Chen; S. vaniotii H. Léveillé.

Herbs 10–50 cm tall, perennial. Caudex simple, apically covered with fibrous remains of petioles. Stem solitary, erect, simple. Basal leaves petiolate; petiole 1–6 cm; leaf blade narrowly elliptic, 8–21 × 1.3–4.5 cm, bipinnately lobed or pinnatisect, abaxially grayish white and densely tomentose, adaxially green and sparsely arachnoid; primary lobes 10–28 pairs. Stem leaves few, similar to basal leaves. Capitulum solitary, terminal on stem. Involucre broadly campanulate, 1.5–2 cm in diam. Phyllaries in 5–7 rows, purple, yellowish tomentose, apex obtuse or acute; outer phyllaries narrowly ovate-elliptic, 6–7 × 1–2 mm; middle phyllaries narrowly ovate, 7–14 × 1.5–2 mm; inner phyllaries narrowly ovate-elliptic, 14–16 × 1–1.5 mm. Corolla purplish red, 1.4–1.7 cm, tube 0.9–1.2 cm, limb 5–7 mm, lobes 3–4 mm. Achene brown, cylindric, 4–5 mm, smooth, glabrous, apex with short crenulate crown. Pappus straw-colored; outer bristles 1.5–4 mm, scabrid; inner bristles 1.2–1.3(–1.7) cm. Fl. and fr. Jul–Aug.

- Forest margins, thickets, grasslands; 3200–4200 m. SW Sichuan (Muli), NW Yunnan.


云南风毛菊 yun nan feng mao ju

Saussurea mairei H. Léveillé; S. vaginata Dunn; S. yunnanensis var. integrifolia Franchet; S. yunnanensis var. runcinata Franchet; S. yunnanensis var. sessilifolia J. Anthony.

Herbs 10–40 cm tall, perennial. Stem solitary, erect, simple, covered at base with fibrous remains of petioles. Basal and lower stem leaves petiolate; petiole 1.5–4 cm; leaf blade elliptic, narrowly elliptic, or linear, 3–20 × 0.2–4(–4) cm, undivided, runcinate-pinnately lobed, or pinnatisect, abaxially grayish white and arachnoid tomentose, adaxially green and glabrous, margin entire, apex acute to acuminate; lateral lobes 1–7 pairs, linear or obliquely narrowly triangular, strongly reclinatus; terminal lobe linear. Middle and upper stem leaves gradually smaller upward on stem. Capitulum solitary, terminal on stem. Involucre campanulate, ca. 2 cm in diam. Phyllaries in ca. 5 rows, apically purplish red, apex long acuminate; outer phyllaries triangular-subulate, ca. 12 × 1 mm; middle phyllaries narrowly ovate-elliptic, 10–13 × ca. 1.5 mm; inner phyllaries narrowly elliptic, ca. 15 × 1.5–2 mm. Corolla purple, ca. 1.5 cm, tube ca. 9 mm, limb ca. 6 mm. Achene cylindric, ca. 4 mm, glabrous. Pappus dirty white; outer bristles ca. 4 mm, plumose; inner bristles ca. 1.3 cm. Fl. and fr. Jul–Oct.

- Stone cliffs, grasslands, gravelly mountain slopes, forests; 2300–4300 m. SW Sichuan (Muli), NW Yunnan (Dêqên, Lijiang).


苞苞风毛菊 bao bao feng mao ju

Saussurea handeliana Y. Ling; S. inconspicua Handel-Mazzetti; S. modesta Handel-Mazzetti.

Herbs 3–20 cm tall, perennial. Stem solitary, purple, slender, erect, densely or sparsely villous. Basal leaves petiolate; petiole to 2 cm; leaf blade narrowly elliptic, 2.5–6.5 × 0.6–1.7

Herbs 10–20 cm tall, perennial. Stem solitary, erect, simple. Basal leaves petiolate; petiole 2–5 cm; leaf blade narrowly elliptic, 5–12 × 1–3 cm, pinnatisect, abaxially grayish white and densely tomentose, adaxially green and sparsely pubescent; lateral lobes (4–)7–15 pairs, oblong, patent, margin entire or with 1 or 2 teeth, apex rounded or obtuse and mucronate; terminal lobes triangular-ovate, apex acute. Stem leaves few or almost absent, sessile, linear, ca. 4 × 0.2 cm. Capitulum solitary, terminal on stem. Involucrally campanulate, 1.5–2.5 cm in diam. Phyllaries in ca. 4 rows, sparsely villous, apex long acuminate; outer phyllaries subulate, ca. 17 × 2 mm; middle phyllaries narrowly elliptic, ca. 15 × 2 mm; inner phyllaries narrowly elliptic, ca. 17 × 2 mm. Corolla purple, ca. 1.2 cm, tube ca. 7 mm, limb ca. 5 mm. Achene cylindric, ca. 3 mm, transversely rugose. Pappus pale brown; outer bristles ca. 3 mm, scabrid; inner bristles ca. 9 mm. Fl. and fr. Jul–Aug.

- Alpine meadows; 4200–4400 m. W Sichuan.


水龙骨风毛菊  shui long gu feng mao ju

Herbs 10–20 cm tall, perennial. Stem solitary, erect, simple. Basal leaves petiolate; petiole 2–5 cm; leaf blade narrowly elliptic, 5–12 × 1–3 cm, pinnatisect, abaxially grayish white and densely tomentose, adaxially green and sparsely pubescent; lateral lobes (4–)7–15 pairs, oblong, patent, margin entire or with 1 or 2 teeth, apex rounded or obtuse and mucronate; terminal lobes triangular-ovate, apex acute. Stem leaves few or almost absent, sessile, linear, ca. 4 × 0.2 cm. Capitulum solitary, terminal on stem. Involucrally campanulate, 1.5–2.5 cm in diam. Phyllaries in ca. 4 rows, sparsely villous, apex long acuminate; outer phyllaries subulate, ca. 10 × 2 mm; middle phyllaries narrowly elliptic, ca. 15 × 2 mm; inner phyllaries narrowly elliptic, ca. 17 × 2 mm. Corolla purple, ca. 1.2 cm, tube ca. 7 mm, limb ca. 5 mm. Achene cylindric, ca. 3 mm, transversely rugose. Pappus pale brown; outer bristles ca. 3 mm, scabrid; inner bristles ca. 9 mm. Fl. and fr. Jul–Aug.

- Alpine meadows; 4200–4400 m. W Sichuan.


林周风毛菊 lin zhou feng mao ju

Herbs 4–6 cm tall, perennial, caespitose, shortly stemmed. Caudex branched, apically covered with brown remains of petioles, with several sterile rosettes and flowering stems. Stem erect, simple, arachnoid. Basal leaves petiolate; petiole purplish red, 1.5–2 cm, base enlarged; leaf blade narrowly elliptic to narrowly obovate, 5–8 × 0.4–1.2 cm, abaxially grayish white and densely tomentose, adaxially green and densely arachnoid pubescent, margin entire or sinuate-lunate, apex acute and mucronate. Stem leaves linear, smaller than basal leaves. Capitulum solitary, terminal on stem. Involucrally campanulate, 2–3 cm in diam. Phyllaries in ca. 4 rows, straw-colored to pale brown, apically greenish or purplish red, arachnoid; outer phyllaries narrowly ovate-elliptic, pale brown; inner phyllaries linear. Receptacle bristles 2–2.5 mm. Corolla purplish red, ca. 2 cm, tube 9–10 mm, limb 8–9 mm. Achene oblong, 3–5 mm, transversely rugose, apex with a short crown. Pappus pale brown; outer bristles scabrid. Fl. and fr. Jul–Aug.

- Alpine grasslands, on sandy soils; 4000–4600 m. C Xizang.


糠秕风毛菊 kang bi feng mao ju

Herbs 5–12 cm tall, perennial. Caudex branched, apically covered with brown remains of petioles, with sterile leaf rosettes and flowering stems. Stem solitary, erect, simple, with glandular hairs. Basal leaves petiolate; petiole 2–3.5 cm; leaf blade oblong, 5–8 × 1.4–2 cm, abaxially grayish white and densely tomentose, adaxially green and strigose, margin subentire, sinuolate, or rarely coarsely dentate with mucronate teeth, apex acuminate. Stem leaves similar to basal leaves. Capitulum solitary, terminal on stem. Involucrally broadly campanulate, ca. 2 cm in diam. Phyllaries in ca. 5 rows, yellowish green or slightly purplish red, with dark purple margin, densely pubescent; outer phyllaries narrowly ovate-elliptic, ca. 10 × 3 mm, apically herbaceous and reflexed; inner phyllaries linear, ca. 14 × 2 mm. Corolla purple, ca. 2 cm, tube 1.2–1.3 cm, limb ca. 7 mm, lobes 4–4.5 mm. Achene cylindric, 3–3.5 mm, smooth, glabrous. Pappus pale brown; outer bristles scabrid. Fl. and fr. Jul–Aug.

- Alpine grasslands; 4300–4400 m. E Xizang (Qamdo).

**Saussurea paleacea** is apparently only known from the type collection. This taxon may be conspecific with *S. limprichtii*.


巴塘风毛菊 ba tang feng mao ju

Herbs to 15 cm tall, perennial. Stem solitary, erect, simple. Leaves petiolate; petiole 2.5–5 cm; leaf blade narrowly obovate or narrowly elliptic, 6–9 × 1–1.5 cm, abaxially grayish white, gland-dotted, and tomentose, adaxially green, gland-dotted, and...
Saussurea subulisquama

**Handel-Mazzetti, Acta Horti Edinburgh 18: 216. 1934.**

Herbs 18–40 cm tall, perennial. Caudex apically covered with blackish remains of petioles. Stem solitary, purple, ca. 5 mm in diam., erect, simple, arachnoid. Basal and lower stem leaves petiolate; petiole 2.5–6 cm; leaf blade narrowly elliptic to narrowly obovate, 6–15 × 1–4 cm, runcinate-pinnately lobed or pinnately dentate, abaxially grayish green and densely arachnoid tomentose, adaxially green and glabrous; lateral lobes 3–6 pairs, semiobovate, ovate, or obliquely triangular, base cuneate-attenuate, margin entire or with 1 or 2 small teeth, apex acute to rounded. Middle and upper stem leaves narrowly elliptic to linear, smaller than basal and lower stem leaves, margin pinnately dentate. Uppermost stem leaves subterminal capitulum, linear, margin entire. Capitulum solitary, on 2 or terminal on stem. Involucre campanulate, 1.5–2.5 cm in diam. Phyllaries in 4–6 rows, basally straw-colored, apically purplish brown, sparsely villose, apex acumenate; outer phyllaries narrowly triangular, 10–12 × ca. 2 mm, apical part green, herbaceous, and usually reflexed; middle phyllaries narrowly ovoid-elliptic, 9–10 × 2–3 mm; inner phyllaries linear, 11–13 × 1–2 mm. Receptacle with bristles. Corolla purple, 1.2–1.6 cm, tube 4–8 mm, limb ca. 8 mm. Achene brown, cylindrical, ca. 4 mm, glabrous. Pappus pale brown; outer bristles ca. 3 mm, scabrid; inner bristles ca. 1.2 cm. Fl. and fr. Aug–Nov.

- Alpine meadows, thickets, *Larix* forests; 3500–4800 m. Qinghai, W Sichuan (Bomi, Mainling, Nyingchi), NW Yunnan (Déqên, Weixi, Zhongdian).

The type material of *Saussurea bomiensis* and other material at PE perfectly match *S. wardii*.


紫白风毛菊 zì bái fēng mào ju

Herbs 18–40 cm tall, perennial. Caudex slender, apically densely covered with blackish brown sometimes fibrously lacerate remains of petioles. Stem erect, densely arachnoid, sometimes glabrescent. Rosette leaves petiolate; petiole to 7 cm; leaf blade narrowly elliptic, 5–23 × 2.5–4 cm, pinnately parted or pinnately lobed, abaxially grayish white and arachnoid tomentose, adaxially green and glabrous; lateral lobes 3–8 pairs, ovate to triangular, margin entire or dentate, apex acute to obtuse and mucronate; terminal lobe triangular. Stem leaves 1–3, shortly petiolate; leaf blade same in division as basal leaves. Capitulum solitary, terminal on stem. Involucre campanulate, 2–3.5 cm in diam. Phyllaries in 5 or 6 rows, sparsely arachnoid, apex acuminate; outer phyllaries narrowly triangular-subulate, 12–14 × ca. 3 mm; middle phyllaries subulate-linear, 15–17 × ca. 3 mm; inner phyllaries linear, ca. 2.2 × 0.2 cm. Corolla purple, ca. 1.8(–2.5) cm, tube ca. 1.4 cm, limb ca. 4 mm. Achene cylindrical, ca. 4 mm, smooth, glabrous. Pappus pale brown; outer bristles ca. 2 mm, scabrid; inner bristles ca. 1.5 mm. Fl. and fr. Jul–Sep.

- Alpine meadows, thickets, forests; 2400–4600 m. Gansu, Qinghai, W Sichuan.
Herbs 4–12 cm tall, perennial, shortly stemmed. Caudex short, covered with remains of petioles. Stem solitary, erect, simple, arachnoid tomentose. Basal leaves petiolate; petiole 2–4 cm; leaf blade obovate-oblong to elliptic, 4–11 × 2–4 cm, lyrate, pinnately lobed, or undivided and margin obtusely dentate, abaxially grayish white and densely tomentose, adaxially green and sparsely arachnoid but glabrescent; lateral lobes 2–5 pairs, ovate, obliquely triangular, or semiobicular, margin sinu-ate, apex obtuse to rounded and usually mucronate; terminal lobe ovate to narrowly ovate, large, margin sub serrate or sinuolate. Stem leaves absent or very few, narrowly linear. Capitulum solitary, in center of leaf rosette or terminal on stem. involucre campanulate, 2–3 cm in diam. Phyllaries in ca. 4 rows, apically white, arachnoid tomentose, apex acute; outer phyllaries linear, ca. 12 × 1 mm; middle phyllaries narrowly ovate-elliptic, 14–17 × 2.5–3.5 mm, apically dull purple; inner phyllaries broadly linear, ca. 2.2 × 0.2 cm. Corolla dark purple, ca. 1.8 cm, tube ca. 1 cm, limb ca. 8 mm. Achene cylindric, ca. 2 mm, transversely rugose. Pappus pale brown; outer bristles ca. 2 mm, scabrid; inner bristles ca. 0.4 cm. Fl. and fr. Aug–Sep.

- Grasslands on mountain slopes; 3000–4200 m. NW Yunnan (Dêqên, Lijiang).

179. **Saussurea pachyneura** Franchet, J. Bot. (Morot) 8: 354. 1894.

**deng e luo feng mao ju**  
*Saussurea bodinieri* H. Léveillé; *S. kunthiana* C. B. Clarke var. *caulescens* Kitamura; *S. kunthiana* var. *major* J. D. Hooker; *S. sikangensis* F. H. Chen.

Herbs 5–30 cm tall, perennial. Caudex simple or branched, densely covered with dark brown remains of petioles. Stem solitary, erect, simple, with brown glandular hairs or glabrous. Basal leaves petiolate; petiole purplish red, 2–9 cm, arachnoid; leaf blade elliptic to narrowly ovate, 5–30 × 1.5–4 cm, pinnatisect, abaxially grayish white and densely arachnoid lanate, adaxially green and glabrous; lateral segments 6–12 pairs, elliptic to ovate, margin coarsely triangular-dentate. Stem leaves 1–3, similar and same in division as basal leaves but smaller. Capitulum solitary, terminal on stem. Involucre campanulate, 2–3.5 cm in diam. Phyllaries in 5 or 6 rows, rigid, sparsely pubescent, basally straw-colored, apically green, margin purplish, apex acuminated; outer phyllaries oblong to narrowly elliptic, ca. 7 × 2 mm, apically herbaceous, green, reflexed; middle phyllaries narrowly ovate, 1.5–1.7 × ca. 0.5 cm; inner phyllaries narrowly ovate-elliptic, ca. 2 × 0.3 cm. Corolla purple to vio-let, ca. 1.8 cm, tube ca. 1.1 cm, limb ca. 7 mm. Achene brown, oblong, 3–3.5 mm, transversely rugose. Pappus white or brownish; outer bristles ca. 2 mm, scabrid; inner bristles ca. 1.5 cm. Fl. and fr. Aug–Sep.

**Rhododendron** thickets, alpine meadows, scree slopes; 3000–4700 m. Guizhou, W Sichuan, SE Xizang, NW Yunnan [Bhutan, India (Sikkim), Myanmar, E Nepal].


**qiao ji feng mao ju**  
*Saussurea likiangensis* var. *integrifolia* Handel-Mazzetti; *S. likiangensis* var. *siningensis* Handel-Mazzetti.

Herbs 3–7 cm tall, perennial, shortly stemmed. Caudex simple, covered with dark brown remains of petioles. Stem solitary, erect, simple. Rosette leaves petiolate; petiole 2–3.5 cm; leaf blade narrowly elliptic, 6–15 × 1.5–2 cm, pinnatisect, abaxially whitish and densely lanate, adaxially green and with articulate glandular hairs; primary segments 10–15 pairs, ovate; secondary lobes 1–3 pairs, triangular, margin revolute, apex acute and mucronate. Capitulum solitary, terminal on stem. Involucre broadly campanulate, 2.2–2.5 cm in diam. Phyllaries in 4 or 5 rows, pale brown or yellowish green, scarious, glabrous, apex acuminate; outer phyllaries narrowly triangular-ovate, apically green and reflexed; inner phyllaries linear, erect. Receptacle bristles subulate, ca. 2 mm. Corolla bluish purple, 2.2–2.5 cm, tube 1–1.2 cm, limb 8–10 mm, lobes 5–6 mm. Achene brown, cylindrical, 3–4.5 mm, glabrous, apex with a short crown. Pappus pale brown; outer bristles 1.1–1.2 cm, plumose; inner bristles 1.5–1.7 cm. Fl. and fr. Jul–Aug.

- Forest margins, by trails; 3300–3400 m. S Xizang (Nyalam).

181. **Saussurea lingulata** Franchet, J. Bot. (Morot) 10: 423. 1896.

**xiao she feng mao ju**  
*Saussurea przewalskii* Hemsley; *S. giralldii* Diels; *S. likiangensis* var. *integrifolia* Handel-Mazzetti; *S. likiangensis* var. *siningensis* Handel-Mazzetti.

Herbs (6–)10–50 cm tall, perennial. Caudex simple or branched, densely covered with dark brown remains of petioles. Stem simple, purplish red, 1–4 mm in diam., erect, arachnoid. Basal leaves petiolate; petiole 2–7 cm, narrowly winged; leaf blade elliptic to narrowly elliptic, 3–15 × 1–2.5 cm, runcinate-pinnately lobed or undivided and margin obtusely dentate, abaxially grayish white and densely arachnoid tomentose, adaxially green and glabrous; lateral lobes 4–9 pairs, obliquely triangular, margin entire, apex obtuse to acute and mucronate; terminal lobe triangular, margin entire, apex acute. Stem leaves few, sessile or subsessile, similar and same in division as basal leaves. Capitula 2–5(–8), clustered in a corymbiform synflorescence or rarely corymb, sub sessile. Involucre campanulate, 1–1.5 cm in diam. Phyllaries in ca. 5 rows, green, glabrous, apex long acuminate; outer and middle phyllaries narrowly ovate-elliptic, 4–13 × 1–2.5 mm; inner phyllaries linear, 14–16 × 1–1.5 mm. Receptacle bristles 4–6 mm. Corolla blackish purple, 1.2–2.5 cm, tube 6–8 mm, limb ca. 6 mm. Achene cylindrical, ca. 2.5 mm. Pappus pale brown; outer bristles 2–3 mm, scabrid; inner bristles 9–10 mm. Fl. and fr. Jul–Oct.

- Rocky slopes, grassy slopes; 3000–4200 m. W Sichuan, NW Yunnan.


**wan chi feng mao ju**  
*Saussurea cirsioidea* Hemsley; *S. giralldii* Diels; *S. likiangensis* Franchet; *S. likiangensis* var. *integrifolia* Handel-Mazzetti; *S. likiangensis* var. *siningensis* Handel-Mazzetti.

Herbs (6–)10–80 cm tall, perennial. Caudex stout, covered with remains of petioles. Stem solitary, blackish purple, erect, simple, arachnoid lanate. Basal leaves petiolate; petiole 4–8 cm, winged; leaf blade narrowly elliptic, 6–18 × 1–3 cm, pinnately lobed, abaxially grayish white or rarely green, golden gland-dotted, densely arachnoid tomentose, and sometimes glabrescent, adaxially green and sparsely arachnoid or glabrous;
Herbs 1–5 cm tall, perennial, caespitose, stemless or shortly stemmed. Caudex densely covered with remains of petioles, sterile leaf rosettes, and flowering stems. Rosette leaves petiolate; petiole to 2.5 cm; leaf blade narrowly obovate, narrowly elliptic, or rarely entire; lateral lobes or teeth 4 or 5 pairs, triangular, margin denticulate, apex mucronate; terminal lobe triangular, apex acute to obtuse. Stem leaves 2–5, shortly petiolate to sessile, gradually smaller upward on stem. Uppermost stem leaves subtending synflorescence, sessile, narrowly elliptic to linear, pinnately lobed to pinnately cleft. Capitula 3–10, clustered in a corymbiform or globose synflorescence, subsessile. Involucrre ovoid to globose, 6–10 mm in diam. Phyllaries in ca. 5 rows, apically blackish purple, sparsely villous; outer phyllaries narrowly ovate-elliptic, 5–6 × 2–3 mm, apex long acuminate; middle phyllaries elliptic, 6–8 × 1.5–2 mm apex acute; inner phyllaries narrowly elliptic, 8–9 × 1–1.5 mm. Corolla purple, 8–9(–15) mm, tube 4–5(–10) mm, limb 4–5 mm. Achene cylindric, 2.5–4 mm, glabrous. Pap- pus pale brown; outer bristles ca. 2 mm, scabrid; inner bristles ca. 7 mm. Fl. and fr. Jul–Sep. 2n = 32*.

Alpine grasslands, scree slopes, forest thickets, margins; 3000–5100 m. Gansu, Qinghai, Shaanxi, W Sichuan, SE Xizang, NW Yunnan [Bhutan].


怒江风毛菊  nu jiang feng mao ju

Saussurea ochrochlaena Handel-Mazzetti.

Herbs 1–10 cm tall, perennial, caespitose, stemless or shortly stemmed. Caudex densely covered with remains of petioles, sterile leaf rosettes, and flowering stems. Rosette leaves petiolate; petiole to 2.5 cm; leaf blade narrowly obovate, narrowly elliptic, or rarely entire; lateral lobes or teeth 4 or 5 pairs, triangular, apex acute to acuminate. Stem leaves if present few, narrowly elliptic to linear. Capitula 3–10, clustered in a corymbiform or hemispheric synflorescence or rarely solitary, shortly pedunculate. Involucrre ovoid, 6–8 mm in diam. Phyllaries in 3 or 4 rows, basally straw-colored, apically green, sparsely vil- low, apex long acuminate; outer phyllaries narrowly ovate-elliptic, 6–7 × ca. 3 mm; middle phyllaries narrowly ovate-elliptic, 9–10 × 3–4 mm; inner phyllaries elliptic, 7–9 × 1–2 mm. Corolla pale purple, ca. 9 mm, tube 5 mm, limb ca. 4 mm. Achene brown, cylindric, 2–4 mm, smooth, glabrous. Pap- pus in 1 row, brown, bristles 8–10 mm, plumose. Fl. and fr. Aug–Oct.

Mountain slopes, mountain tops, meadows, sandy areas, dry riverbeds; 2800–4500 m. Gansu, Qinghai, E Xizang.

Saussurea arenaria is similar to S. andryaloides, which differs by smaller capitula, denser leaf indumentum, and lyrate or pinnately lobed leaves. Some specimens are intermediate between the two species.


中甸风毛菊 zhong dian feng mao ju

Herbs 2–4 cm tall, perennial, stemless or shortly stemmed. Caudex slender, usually branched, apically covered with brown remains of petioles. Rosette leaves petiolate; petiole 1–1.5 cm; leaf blade narrowly elliptic to obovate, 1–4 × 0.8–1.7 cm, sub- lyrate with 5–8 pairs of lobes or undivided and margin shallowly crenate or subentire, abaxially grayish white and densely tomentose, adaxially green and glabrous, apex obtuse to rounded and mucronate. Capitula solitary or rarely 2, in center of leaf rosette or terminal on stem. Involucrre campanulate, 1–1.5 cm in diam. Phyllaries in 3 or 4 rows, apically pale purple, glabrous, apex acuminate; outer phyllaries narrowly triangular, 7–10 × ca. 2 mm; middle phyllaries narrowly elliptic, ca. 12 × 2 mm; inner phyllaries broadly linear, ca. 15 × 2 mm. Receptacle naked. Corolla purple, ca. 1.5 cm, tube 9–10 mm, limb ca. 6 mm. Achene cylindric, ca. 3 mm, transversely rugose, glabrous. Pap- pus pale brown; outer bristles ca. 3 mm, scabrid; inner bris- tles ca. 1.5 cm. Fl. and fr. Aug–Oct.

Forest margins, grasslands by small streams, gravelly mountain slopes; 3000–4000 m. SW Sichuan (Muli), NW Yunnan (Déqên, Zhong- dian).


双齿风毛菊 sha sheng feng mao ju

Herbs 1–6 cm tall, perennial, stemless or shortly stemmed. Rootstock fibrously split. Caudex simple or few branched, covered with fibrously lacerrate remains of petioles. Stem if present straw-colored, 1–3 cm, sparsely arachnoid, leafless or with 1 single leaf. Rosette leaves petiolate; leaf blade narrowly elliptic-linear, 3.5–5 × 0.6–1 cm, pinnatisect, abaxially white tomentose, adaxially green and glabrous; lateral segments 10–20 pairs, split in 2 unequal lobes or simple, linear, 3–5 × 0.8–1.5 mm, margin revolute, apex acuminate. Capitulum solitary, in center of leaf rosette or terminal on stem. Involucrre cylindric to narrowly campanulate, 1–1.5 cm in diam. Phyllaries in 4 or 5 rows, straw-colored or brown, glabrescent, apex acute to acuminate; outer phyllaries narrowly ovate-triangular, 9–10 × 2–3.5 mm; middle phyllaries narrowly ovate, 10–13 × 2–2.5 mm;
inner phyllaries linear, 13–17 × 1–1.5 mm. Receptacle bristles subulate, 1–2.5 mm. Corolla purple, 1.5–1.7 cm, tube 0.9–1.1 cm, limb 5.5–7 mm, lobes 3–4 mm. Achene straw-colored, gray, or ivory white, 3–4 mm, glabrous, apex with a short crenulate crown. Pappus in 1 row, light brown, bristles 1.3–1.5 cm and plumose. Fl. and fr. Sep.–Oct.


Herbs 2–6 cm tall, perennial, stemless or shortly stemmed. Caudex simple or few branched, apically covered with remains of petioles. Stem if present simple, whitish, erect, densely tomentose. Rosette leaves shortly petiolate or sessile, exceeding capitula; petiole to 2 cm; leaf blade broadly linear to narrowly ovate-elliptic, 12–17 × 3–4 mm; middle phyllaries narrowly triangular, 11–12 × 3–4 mm; inner phyllaries narrowly elliptic-linear, 10–18 × 1–1.5 cm in diam. Phyllaries in 3 or 4 rows, narrowly ovate-elliptic, 11–12 × 3–4 mm; middle phyllaries narrowly elliptic, 12–17 × 3–4 mm; inner phyllaries narrowly elliptic, 15–20 × 1–3 mm. Corolla purplish red, 0.9–1.8 cm, tube 5–12 mm, limb 4–6 mm. Achene brown, cylindric, 3–4 mm, smooth, glabrous. Pappus pale brown; outer bristles 0.5–4 mm, scabrid; inner bristles 1.4–1.5 cm. Fl. and fr. Aug.–Oct.

Scree slopes, steppes, meadows, thickets; 3200–5400 m. Qinghai, Xinjiang, Xizang [NW India, Kashmir].

Saussurea andryaloides is very widespread in the W and C parts of the Qinghai-Xizang Plateau. In Chinese provincial floras of Xizang and Xinjiang, it has been treated as of the Qinghai-Xizang Plateau. In Chinese provincial floras of Xizang Xinjiang, Xizang [NW India, Kashmir].

188. Saussurea andersonii C. B. Clarke, Compos. Ind. 226. 1876.

卵苞风毛菊 lian bao feng mao ju

Saussurea flavovirens Y. L. Chen & S. Yun Liang.

Herbs 2–5[–15] cm tall, perennial, stemless or slightly stemmed. Caudex slender, simple or few branched, covered with dark brown remains of petioles. Rosette leaves petiolate; petiole 5–10 mm, base enlarged to an ovate sheath; leaf blade linear, 2.5–6[–11] × 0.2–0.5[–1.5] cm, pinnately lobed or pinnately dentate, abaxially pale green and sparsely pilose on veins and margin, adaxially green and glabrous; lateral lobes or teeth 3–7 pairs, obliquely triangular, recurved, margin entire or dentate, apex acuminated. Capitulum solitary, in center of leaf rosette or terminal on a short stem. Involucere campanulate, [0.6–]1–1.5 cm in diam. Phyllaries in 4 or 5 rows, yellowish green, glabrous, apex acuminate; outer phyllaries narrowly ovate, 8–11 × 3–4[–5] mm, apically green, apex reflexed; middle and inner phyllaries narrowly elliptic-linear, 10–15[–18] × 1–3 mm, apically purplish red. Receptacle naked or with few short bristles. Corolla purplish red, 2–2.3 cm, tube 1–1.2 cm, limb 8–11 mm, lobes 5–5.5 mm. Achene cylindric, 3–4 mm, transversely rugose, apex with a short crown. Pappus reddish brown; outer bristles short, scabrid, sometimes very few or absent; inner bristles 1.5–1.8 mm. Fl. and fr. Aug.–Oct.

Alpine grasslands; ca. 4000 m. SW Sichuan (Muli).


卵苞风毛菊 zi bao feng mao ju

Herbs to 5 cm tall, perennial, shortly stemmed. Caudex covered with brown remains of petioles. Stem solitary, erect, simple, pubescent. Rosette leaves sessile or shortly petiolate; leaf blade linear, 4–9 × 0.3–0.8 cm, runcinate pinnately lobed, abaxially grayish green and densely tomentose, adaxially green and glabrous; lateral lobes 8–15 pairs, narrowly triangular, apex acute and mucronate. Capitulum solitary, terminal on stem. Involucere broadly campanulate, 2–2.5 cm in diam. Phyllaries in ca. 4 rows, glabrous, apex acuminate; outer phyllaries narrowly ovate-elliptic, 13–14 × ca. 4 mm, apically green, herbaceous, and reflexed; inner phyllaries linear, ca. 17 × 2 mm, basally pale green, apically purple and erect. Receptacle bristles ca. 2 mm. Corolla purplish red, 1.5–1.8 cm, tube 8–10 mm, limb 7–9 mm, lobes 4–5 mm. Achene brown, cylindric, ca. 2 mm, smooth, glabrous, apically with a short crown. Pappus pale brown; outer bristles 8–10 mm; inner bristles ca. 1.2 cm. Fl. and fr. Jul.–Aug.

● Thickets on mountain slopes; ca. 4200 m. S Xizang (Yadong) [?Bhuntan].

Saussurea purpurascens is only known from the type and may well be only a variety of S. andersonii with developed short stems and adaxially tomentose leaves.


聂拉木风毛菊 nie la mu feng mao ju

Herbs 2–3 cm tall, perennial, usually caespitose. Caudex simple or few branched, covered with brown fibrous remains of petioles. Rosette leaves petiolate; petiole base widened to a purplish red sheath; leaf blade linear, 2.5–4.5 × 0.3–0.7 cm, runcinate pinnatisect, abaxially grayish white and densely tomentose, adaxially densely pilose with articulate hairs; lateral lobes 6–9 pairs, triangular, margin revolute and usually entire, apex acuminate and mucronate. Capitulum solitary, in center of leaf rosette, sessile. Involucere narrowly campanulate, 6–10 mm in diam. Phyllaries in 3 or 4 rows, narrowly ovate-elliptic, yellowish brown to yellowish green, margin and apically dark purplish red. Receptacle bristles subulate, 1–2 mm. Corolla purplish red, 1.2–1.4 cm, tube 4–7 mm, limb ca. 7 mm. Achene ca.

- Alpine grasslands, scree slopes; ca. 4700 m. S Xizang (Nyalaam, Zhongba).


倒披针叶风毛菊 dao pi zhen ye feng mao ju

Herbs 5–10(–15) cm tall, perennial. Caudex usually simple, apically covered with fibrous remains of petioles. Leaves petiolate; petiole 1–7 cm; leaf blade obovate to narrowly obovate, 3.5–12 × 1–3 cm, shallowly pinnately lobed or undivided and margin sinuate-dentate, abaxially grayish white and densely arachnoid tomentose, adaxially green, scabrid, and densely covered with articulate hairs; lateral lobes 4–6 pairs, triangular-ovate to almost orbicular, 3–8 × 5–10 mm, margin denticulate, apex acute and mucronate. Receptacle with bristles. Corolla pale purplish red, 1.6–1.8 cm, tube 9–10 mm, limb 7–8 mm, lobes 4–5 mm. Achene cylindric, 2–3 mm, transversely rugose, glabrous. Pappus dirty white; outer bristles 2–3 mm, barbellate; inner bristles 1.2–1.4 cm. Fl. and fr. Aug.–Sep.

Alpine grasslands on slopes, near rivers; [3000–]4500–5000 m. ?SC Xizang [Bhutan, India (Sikkim)].

Specimens of Saussurea nimborum in PE do not match the type material of S. nimborum at K but belong to different Saussurea species. The presence of S. nimborum in China is doubtful.


康定风毛菊 kāng dìng fēng mào ju

Herbs 2–2.5 cm tall, perennial, stemless. Caudex slender, usually branched, apically covered with remains of petioles. Rosette leaves petiolate; petiole 1–1.5 cm; leaf blade elliptic to obovate-elliptic, 1.5–4.5 × 0.8–1.5 cm, pinnately lobed, abaxially grayish white and densely tomentose, adaxially dull green, scabrid, and with articulate hairs; lateral lobes 4–8 pairs, ovate, oblong, or semiorbicular, margin entire or denticulate, apex rounded and mucronate. Capitulum solitary, in center of leaf rosette. Involucre campanulate, 0.8–1.3 cm in diam. Phyllaries in 3 or 4 rows, apically and near margin greenish or purple, pubescent; outer and middle phyllaries narrowly ovate-elliptic, 8–10 × 1.5–2 mm, apex long acuminate; inner phyllaries linear, 12–15 × 1.5 cm, apex acute to subobtuse. Receptacle bristles to 1.5 mm. Corolla purplish red, 1.6–1.8 cm, tube 1.2–1.4 cm, limb ca. 4 mm. Achene cylindrical, ca. 2 mm, transversely rugose. Pappus pale brown; outer bristles 3 mm, scabrid; inner bristles ca. 1.3 cm. Fl. and fr. Aug.–Sep. 2n = 30*.

- Thickets, alpine grasslands; 3800–4900 m. Qinghai, W Sichuan, Xizang.


脣牙状风毛菊 shī yá zhuàng fēng mào ju

Aplotaxis leontodontoides Candolle, Prodr. 6: 539. 1838; Saussurea irregularis Y. L. Chen & S. Yun Liang; S. kunthiana C. B. Clarke; S. kunthiana var. filicifolia J. D. Hooker; S. leontodontoides var. filicifolia (J. D. Hooker) Handel-Mazzetti; S. rhytidocarpa Handel-Mazzetti; S. sungpanensis Handel-Mazzetti.

Herbs 3–15 cm tall, perennial, stemless or shortly stemmed. Caudex usually branched, densely covered with remains of petioles, often with several leaf rosettes and flowering shoots. Stem if present simple, grayish white, arachnoid lanate, glabrescent. Rosette leaves petiolate; petiole 1–4 cm; leaf blade linear-oblong to narrowly elliptic, 3–18 × (0.4–)0.8–2.5 cm, pinnatisect, abaxially grayish white and densely tomentose, adaxially green, scabrid, strigose, and sometimes glabrescent; segments (5–)8–12 pairs, elliptic, semiorbicular, quadrangular, obliquely ovate, or subtriangular, 4–15 × 2–10 mm, margin entire, apex rounded to obtuse and mucronate. Capitulum solitary, in center of leaf rosette or terminal on stem. Involucre campanulate, 1–3 cm in diam. Phyllaries in 4–6 rows, straw-colored or yellowish green, green or purplish at margin, glabrous; outer and middle phyllaries narrowly ovate-triangular, 9–12 × 0.5–3 mm, apex acuminate; inner phyllaries narrowly elliptic to linear, 14–15 × 1.5–2 mm, apex acute. Receptacle bristles 2–3 mm. Corolla purplish red, (1.4–)1.7–2.2 cm, tube 1–1.4 cm, limb to 7–8 mm, lobes 4–5 mm. Achene cylindrical, 2–4 mm, transversely rugose, glabrous. Pappus pale brown; outer bristles 2–3 mm, scabrid; inner bristles 1–1.6 cm. Fl. and fr. Aug.–Nov. 2n = 30*.

Scree slopes, forests, forest margins, thickets; 3200–5500 m. Qinghai, W Sichuan, Xizang, NW Yunnan [NE and NW India, Kashmir, Nepal].

Saussurea irregularis, described from a single specimen and not recorded again, is said to differ from S. leontodontoides by glabrous (not scabrid and strigose) leaf surface and remote, irregularly placed leaf lobes. We think it is only a slightly deviating form of the widespread and vegetatively very variable S. leontodontoides.


甘肃风毛菊 gāng sī fēng mào ju

Herbs 3–5 cm tall, perennial, stemless or shortly stemmed. Caudex usually branched, apically covered with remains of petioles. Stem if present simple, purplish brown, densely covered with articulate hairs. Rosette leaves petiolate; petiole 0.5–3 cm; leaf blade narrowly elliptic-oblong, 4(–20)×3–14 cm, pinnatisect, abaxially grayish white, gland-dotted, and densely tomentose, adaxially green, scabrid, and densely strigose with articulate hairs; lateral segments 8–20 pairs, obliquely triangular-ovate, ovate, or elliptic, 0.5–2 × 0.5–1.8 cm, margin entire or dentate. Capitulum solitary, in center of leaf rosette. Involucre campanulate, 2–4 cm in diam. Phyllaries in 4 or 5 rows, straw-colored with narrow dark margin, sparsely pilose but glabrescent, apically green and herbaceous, apex long acuminate;
Herbs 2–6 cm tall, perennial, stemless or shortly stemmed. Stem if present simple, 1–2 mm in diam., erect, covered at base with remains of petioles. Rosette leaves petiolate; petiole to 2 cm; leaf blade linear-oblong to narrowly elliptic, 3–8 × 0.5–1.5 cm, pinnatisect, abaxially grayish white and densely tomentose, axially green and sparsely arachnoid; lateral segments 6–15 pairs, obliquely quadrangular or triangular, 3–6 × 2–6 mm, margin and apex mucronulate. Stem leaves 1–3, similar to basal leaves, 1.5–2.5 × 0.3–0.6 cm; lateral segments 3–6 pairs. Up- permost stem leaves linear, undivided, margin dentate. Capit- ulum solitary, terminal on stem. Involucre campanulate, 1.5–2 cm in diam. Phyllaries in ca. 5 rows, sparsely pilose, apically reflexed, apex acuminate; outer phyllaries ovate-elliptic, 7–8 × 2–2.5 mm; middle phyllaries narrowly ovate-elliptic, 7–12 × 2.5–3 mm; inner phyllaries narrowly elliptic to linear, 12–14 × 1.5–2 mm, erect. Receptacle bristles subulate, 2–5 mm. Corolla dark purple, (1–)1.8–2(–3) × 0.4–0.5 cm; middle phyllaries narrowly elliptic, 1.5–2.2 × 0.3–0.4 cm; inner phyllaries linear, 2.3–2.6 × 0.1–0.2 cm. Recep- tacle bristles yellowish brown, subulate, 3–4 mm. Corolla dark purple, 2.5–3 cm, tube 1.7–2 cm, limb 8–10 mm, lobes 5–6 mm. Achene brown, cylindric, 4.5–5 mm, smooth, glabrous, apex with a short crown. Pappus dirty white; outer bristles 4–6 mm, scabrid; inner bristles 2–2.2 cm. Fl. and fr. Aug–Oct.

- Alpine grasslands and steppes, in sandy soils; 3400–4300 m. Gansu, Qinghai, NW Sichuan.


光果风毛菊 guang guo feng mao ju

Herbs 2–6 cm tall, perennial, stemless or shortly stemmed. Stem if present simple, 1–2 mm in diam., erect, covered at base with remains of petioles. Rosette leaves petiolate; petiole to 2 cm; leaf blade linear-oblong to narrowly elliptic, 3–8 × 0.5–1.5 cm, pinnatisect, abaxially grayish white and densely tomentose, axially green and sparsely arachnoid; lateral segments 6–15 pairs, obliquely quadrangular or triangular, 3–6 × 2–6 mm, margin and apex mucronulate. Stem leaves 1–3, similar to basal leaves, 1.5–2.5 × 0.3–0.6 cm; lateral segments 3–6 pairs. Uppermost stem leaves linear, undivided, margin dentate. Capit- ulum solitary, terminal on stem. Involucre campanulate, 1.5–2 cm in diam. Phyllaries in ca. 5 rows, sparsely pilose, apically reflexed, apex acuminate; outer phyllaries ovate-elliptic, 7–8 × 2–2.5 mm; middle phyllaries narrowly ovate-elliptic, 7–12 × 2.5–3 mm; inner phyllaries narrowly elliptic to linear, 12–14 × 1.5–2 mm, erect. Receptacle bristles subulate, 2–5 mm. Corolla purple, 1.4–1.5 cm, tube 7–8 mm, limb 7–8 mm, lobes 4–4.5 mm. Achene brown, obovoid, 2–3 mm, smooth, glabrous, apically with a short crown. Pappus pale brown; outer bristles 2.5–6 mm, scabrid; inner bristles 1.3–1.5 cm. Fl. and fr. Aug–Oct.

- Mountain slopes; ca. 3600 m. W Sichuan (Yadong).


亚东风毛菊 ya dong feng mao ju

Herbs, perennial, caespitose, stemless or shortly stemmed. Stem if present to 1 cm. Basal leaves narrowly oblanceolate to narrowly obovate, 3.5–11 × 0.8–2.2 cm, pinnatisect, abaxially gland-dotted and sparsely arachnoid lanate with articulate hairs, adaxially green, gland-dotted, and sparsely pilose with articulate hairs; lateral segments 8–13 pairs, ovate-triang- ular to obovate, to 1 × 1 cm, margin denticulate, apex mucronulate. Capitulum solitary, in center of leaf rosette or terminal on stem. Involucre campanulate, 0.8–1.6 cm in diam. Phyllaries in ca. 5 rows, apically purplish and villous, glabrescent; outer phyllaries ovate to narrowly triangular-obovate, 13–15 × 3.5–5.5 mm, apically reflexed, apex acuminate; middle phyllaries narrowly ovate-elliptic, 16–18 × 2–2.5 mm, apically reflexed; inner phyllaries ca. 1.5 mm wide, erect. Receptacle bristles 6–9 mm. Corolla purple, 1.4–1.9 cm, with few small capitate hairs, tube 7.5–10 mm, limb 6.5–9 mm, lobes 3.7–4.5 mm. Achene obovoid, smooth, apically with a prominent crown of many narrow scales. Pappus outer bristles 8–11 mm, plumose; inner bristles 1.1–1.3 cm. Fl. and fr. Sep.

Alpine meadows, stony slopes, scree slopes; ca. 4500 m. S Xizang (Yadong) [?Bhutan, India (Sikkim), E Nepal].

No specimens of Saussurea donkiah from China were seen by the present authors, and the description here is based on the protologue, which cites a specimen from S Xizang (Yadong).


莲座风毛菊组 lian zuo feng mao ju zu


Herbs, perennial, rhizomatous, with well-developed, simple or branched flowering stems. Basal and lower stem leaves rosulate or subrosulate, present at anthesis. Middle and upper stem leaves few, much reduced. Capitula solitary or several, sometimes supported by uppermost stem leaves. Involucre campanulate, ovoid, cylindric, funnel-shaped, turbinate, or subglobose. Phyllaries...
imbricate, margin entire, apex obtuse or acuminate. Receptacle with bristles. Anther tails ciliate or lacerate. Achene usually ribbed, glabrous, sometimes with a small crown. Pappus usually in 2 rows; outer bristles scabrid, rarely lacking.

About 17 species: China, Korea, Russia (Far East, Siberia); nine species (eight endemic) in China.

Saussurea sect. Rosulacentes is rather ill-defined as there are many species with few and reduced stem leaves, which have been placed in other sections, and some of the following species can have a number of stem leaves as well. Saussurea alatipes and S. huashanensis are very similar to S. fargesii, so they have been placed in this section. However, these three species may also be placed in S. sect. Saussurea.

1a. Petiole of basal leaves broadly winged, wings dentate or lobed.

2a. Petiole to 11 cm, with 1–6 pairs of lobes or teeth; leaf blade papery; capitula in ± clustered, corymbiform synflorescence; phyllaries papery, apex purple, short acuminate, reflexed .................................................. 198. S. alatipes

2b. Petiole to 6 cm, with 1–3 pairs of lobes or teeth; leaf blade leathery; capitula in lax synflorescence; phyllaries leathery, apical part green, herbaceous, reflexed .......................................................... 200. S. fargesii

1b. Petiole of basal leaves wingless or narrowly winged.

3a. Leaf blade usually lyrate-pinnately lobed; plants 60–100 cm tall ........................................... 203. S. kungii

3b. Leaf blade not lyrate, pinnately lobed or undivided; plants 10–60 cm tall.

4a. Leaf blade pinnately dentate, pinnately lobed to pinnatisect.

5a. Stem simple; capitulum solitary at end of stem; leaf blade pinnately lobed or with large triangular teeth .......................................................... 201. S. acrophiila

5b. Stem apically few branched, capitula solitary or 2, at end of branches; leaf blade deeply pinnately lobed to pinnatisect .......................................................... 202. S. paucijuga

4b. Leaf blade undivided, margin entire, sinuate-dentate, denticate, or shallowly crenate.

6a. Capitula solitary or rarely 2, terminal on stem.

7a. Leaves green on both surfaces, concolorous ........................................... 252. S. superba (see S. sect. Saussurea)

7b. Leaves abaxially grayish white, densely tomentose, adaxially green .................................. 206. S. tomentosa

6b. Capitula several (2–10), in corymbiform synflorescence.

8a. Leaf blade obovate to narrowly obovate, 2–4.5 cm wide ................................................... 204. S. oligocephala

8b. Leaf blade ovate or elliptic, usually more than 5 cm wide.

9a. Leaf blade usually ovate or triangular-ovate; leaf base cordate or truncate ............... 199. S. huashanensis

9b. Leaf blade usually elliptic; leaf base cuneate-attenuate ........................................... 205. S. oblongifolia


华山风毛菊


华山风毛菊

Herbs 15–40 cm tall, perennial. Rhizome oblique-ascending, covered with blackish brown remains of petioles. Stem solitary, 1–3 mm in diam., erect, simple or branched. Rosette and lower stem leaves petiolate; petiole winged, 3–11 cm, with 1–6 obliquely triangular lobes or large teeth; leaf blade ovate to narrowly ovate-elliptic, 6–10 × 3.5–8 cm, abaxially grayish to greenish white, gland-dotted, and densely tomentose, adaxially green, scabrid, and strigose, base cordate to rounded, margin sinuate-dentate, apex acuminate. Middle and upper stem leaves sessile, narrowly elliptic to linear, 2–7 × 0.1–1 cm. Capitula several, solitary or in groups of to 3 on end of branches in a corymbiform synflorescence, pedunculate. Involucre cylindrical to campanulate, 0.7–1.3 cm in diam. Phyllaries in 5–7 rows, pale green, arachnoid tomentose to glabrescent, apex acuminate to acute; outer phyllaries triangular-ovate, 3–4 × 1–2 mm, apex dark purple; middle phyllaries narrowly ovate-elliptic, 4–9 × 2–2.5 mm; inner phyllaries narrowly elliptic to linear, 9–12 × 1–1.5 mm, apically bearded. Corolla pale purple, 1–1.2 cm, tube 5–6 mm, limb 5.5–6.5 mm. Achene cylindric, ca. 5 mm, 5-ribbed, glabrous. Pappus white; outer bristles 1.5–2.5 mm; inner bristles 8–10(–13) mm. Fl. and fr. Jul.–Aug.

- Tallgrass meadows, thickets; 1800–2100 m. N and NE Chongqing (Chengkou, Wu Shan, Wuxi), W Hubei (Badong, Shennongjia).
Saussurea huashanensis is very close to *S. alatipes* but differs by the unwinged or narrowly winged petioles. *Saussurea huashanensis* seems to replace *S. alatipes* in the E part of the Qin Ling range.

### 200. Saussurea fargesii Franchet

J. Bot. (Morot) 8: 344. 1894.

川东风毛菊 chuan dong feng mao ju

Herbs 50–60 cm tall, perennial. Rhizome stout, simple. Stem solitary, erect, apically branched, sparsely strigose. Rosette and lower stem leaves petiolate; petiole 3–6 cm, broadly winged, wing sinuolate and decurrent on stem; leaf blade broadly ovate, 16–20 × 7–10 cm, leathery, abaxially greyish white and densely tomentose, adaxially green and sparsely strigose, base corduate, truncate, or obtuse; margin shallowly crenate, apex shortly acuminate. Upper stem leaves 2, sessile, ovate-elliptic, 7–10 × 2.5–4.5 cm, base decurrent, margin subentire, apex acuminate. Uppermost stem leaves linear, 2.5–5 × 0.1–0.3 cm. Capitula 1–4, at end of branches, in a lax racemiform synflorescence. Involucre broadly campanulate, 1–2 cm in diam. Phyllaries in 4 or 5 rows, leathery, straw-colored with brown margin, villous; outer phyllaries suborbicular to broadly ovate, 8–10 × 3–5 mm, apical part green, herbaceous, and erect or reflexed, apex acuminate; middle phyllaries oblanceolate, 10–12 × 1.5–2 mm, apex obtuse. Receptacle bristles 2–5 mm. Corolla purple, 1–1.2 cm, tube 5–6 mm, limb 5–6 mm, lobes 3–3.5 mm. Achene oblong, 2.5–3 mm, glabrous. Pappus in 1 row, 8–9 mm, plumose.

- N Chongqing (Chengkou).

*Saussurea fargesii* is apparently only known from the type and may be conspecific with *S. alatipes*.

### 201. Saussurea acrophila Diels


破血丹 po xue dan

Herbs 10–20 cm tall, perennial. Rhizome short, apically covered with dull brown remains of petioles. Stem solitary, slender, erect, simple or few branched, sparsely white arachnoid lanate. Basal and lower stem leaves petiolate; petiole 1.5–4 cm; leaf blade narrowly elliptic to obovate-elliptic, 3–11 × 0.9–2 cm, papery, pinnately lobed to pinnateiset, abaxially pale green and sparsely arachnoid, adaxially green and glabrous; apex acute to shortly acuminate; lateral lobes 3–6 pairs, elliptic-ovate to triangular, margin entire, apex acuminate and long mucronate; terminal lobe triangular. Middle and upper stem leaves very few, narrowly elliptic to linear, ca. 10 × 2 mm. Capitula 1 or 2, at end of branches, long pedunculate. Involucre campanulate to funnel-shaped, 7–12 mm in diam. Phyllaries in 4 or 5 rows, straw-colored, apically green or purple, and arachnoid, glabrescent, apex acuminate with a cartilaginous mucro; outer phyllaries ovate, 3–4 × ca. 2 mm; middle phyllaries narrowly elliptic, 4–6 × 2–3 mm; inner phyllaries narrowly obovate-elliptic to linear, 6–8 × 1–2 mm. Corolla purple, 1–1.1 cm, tube 4–5 mm, limb ca. 6 mm. Achene pale brown, cylindrical, ca. 3 mm, glabrous. Pappus dirty white; outer bristles ca. 2 mm; inner bristles 7–8 mm. Fl. Aug–Oct.

- N Chongqing; 2400–2800 m. S Shaanxi (Qin Ling).

*Saussurea acrophila* is very close to and probably conspecific with *S. acrophylla*.

### 202. Saussurea paucijuga Y. Ling


深裂风毛菊 shen lie feng mao ju

Herbs 10–32 cm tall, perennial. Rhizome short, apically covered with dull brown remains of petioles. Stem solitary, slender, erect, simple or few branched, sparsely white arachnoid lanate. Basal and lower stem leaves petiolate; petiole 1.5–4 cm; leaf blade narrowly elliptic to obovate-elliptic, 3–11 × 0.9–2 cm, papery, pinnately lobed to pinnateiset, abaxially pale green and sparsely arachnoid, adaxially green and glabrous; apex acute to shortly acuminate; lateral lobes 3–6 pairs, elliptic-ovate to triangular, margin entire, apex acuminate and long mucronate; terminal lobe triangular. Middle and upper stem leaves very few, narrowly elliptic to linear, ca. 10 × 2 mm. Capitula 1 or 2, at end of branches, long pedunculate. Involucre campanulate to funnel-shaped, 7–12 mm in diam. Phyllaries in 4 or 5 rows, straw-colored, apically green or purple, and arachnoid, glabrescent, apex acuminate with a cartilaginous mucro; outer phyllaries ovate, 3–4 × ca. 2 mm; middle phyllaries narrowly elliptic, 4–6 × 2–3 mm; inner phyllaries narrowly obovate-elliptic to linear, 6–8 × 1–2 mm. Corolla purple, 1–1.1 cm, tube 4–5 mm, limb ca. 6 mm. Achene pale brown, cylindrical, ca. 3 mm, glabrous. Pappus dirty white; outer bristles ca. 2 mm; inner bristles 7–8 mm. Fl. Aug–Oct.

- N Chongqing; 1800–1900 m. S Shaanxi (Qin Ling).

*Saussurea buchowii* is very close to and probably conspecific with *S. acrophylla*.

### 203. Saussurea kungii Y. Ling


洋县风毛菊 yang xian feng mao ju

Herbs 60–100 cm tall, perennial. Rhizome stout, obliquely ascending. Stem solitary, brownish purple, slender, erect, apically branched, arachnoid, basally glabrescent. Basal leaves petiolate; petiole 2–3.5 cm; leaf blade narrowly obovate-elliptic, 15–20 × 3–6 cm, thinly papery, lyrate-pinnately lobed, abaxially pale green and glabrous, adaxially green or purple and glabrous; lateral lobes 1–4 pairs, margin entire or subentire; terminal lobe narrowly ovate-triangular to narrowly elliptic, large, apex acute to acuminate. Middle and upper stem leaves 1 or 2, narrowly elliptic to linear, 1.5–3 × 0.2–0.5 cm, margin entire, apex acute. Capitula few to numerous, in a corymbiform synflorescence. Involucre turbinate, 5–12 mm in diam. Phyllaries in 4 or 5 rows, arachnoid; outer phyllaries triangular-ovate, ca. 11 × 3 mm, green, apex acute; middle phyllaries oblong to narrowly elliptic, 9 × 1–2 mm, herbaceous, purple, apex rounded to obtuse; inner phyllaries linear, ca. 11 × 1 mm, apex acute. Receptacle bristles 5–8 mm. Corolla purple, ca. 1.3 cm. Achene oblong, ca. 4 mm, ribbed, glabrous. Pappus dirty white; outer bristles ca. 3 mm; inner bristles 6–8 mm. Fl. and fr. Sep–Oct.

- Forests on mountain slopes; 1800–1900 m. S Shaanxi (Qin Ling).

### 204. Saussurea oligocephala (Y. Ling) Y. Ling


少头风毛菊 shao tou feng mao ju

Herbs 10–60 cm tall, perennial. Rhizome obliquely ascending, apically covered with remains of petioles. Stem solitary, slender, erect, apically branched, sparsely arachnoid, glabrescent. Basal leaves petiolate; leaf blade obovate to narrowly obovate-elliptic, 4–12 × 2–4.5 cm, thinly papery, abaxially purplish red and subglabrous, adaxially green and with multicellular articulating hairs, base cuneate-attenuate, margin sinuate or dentate, apex acute to obtuse. Stem leaves few, linear, small, margin entire. Capitula solitary or 2–9 in a lax corymbiform synflorescence. Involucre turbinate to narrowly campanulate, margin entire. Capitula solitary or 2–9 in a lax corymbiform synflorescence. Involucre turbinate to narrowly campanulate, margin entire. Capitula solitary or 2–9 in a lax corymbiform synflorescence. Involucre turbinate to narrowly campanulate, margin entire. Capitula solitary or 2–9 in a lax corymbiform synflorescence.

### 205. Saussurea oblongifolia


长圆叶风毛菊  chang yuan ye feng mao ju

Herbs 40–50 cm tall, perennial. Rhizome simple. Stem solitary, erect, apically branched, arachnoid. Basal and lower stem leaves long petiolate; petiole to 5 cm; leaf blade ovate to narrowly elliptic-linear, 12–15 × 5–6 cm, abaxially pale green and sparsely arachnoid, adaxially green and scarbid, margin denticulate, apex acute. Middle and upper stem leaves sessile, narrowly elliptic, base attenuate, apex acuminate. Capitula 5–10, in a lax corymbiform synflorescence, pedunculate. Involucre campanulate or subglobose, 1–2 cm in diam. Phyllaries in 4–6 rows, yellowish brown with brown margin, sparsely pubescent; outer phyllaries ovate, 3–5 × 2–3.5 mm, apex acute; inner phyllaries narrowly elliptic, 5–10 × 1–2 mm, apex acuminate. Corolla 1.2 cm. Achene immature. Pappus dirty white; outer bristles scabrid; inner bristles ca. 1 cm.

- **Fl. and fr. Sep.–Oct.**
- **Syn:** Changyuanwindsow [Changbai Shan] [Korea, Russia (Far East)].
- **Forests, thickets; 2000–3000 m. S Shaanxi (Qin Ling).**

### 206. Saussurea tomentosa


高岭风毛菊  gao ling feng mao ju

**Saussurea alpica** Kitamura, S. eriophylla Nakai var. alpina Nakai.

Herbs 10–30 cm tall, perennial. Stem erect, simple, sparsely tomentose. Basal and lower stem leaves petiolate; petiole 2–4 cm; leaf blade triangular to triangular-ovate, 3–12 × 1–3.5 cm, abaxially grayish white and densely tomentose, adaxially green and sparsely arachnoid tomentose to subglabrous, base cordate, truncate, or cuneate, margin sharply dentate or entire, apex acuminate, acute, or sometimes obtuse. Middle and upper stem leaves few, narrowly elliptic to linear, margin sharply dentate or entire. Capitula solitary or 2, terminal on stem, usually subtended by 1 or 2 linear leaves. Involucre campanulate, 2–2.5 cm in diam. Phyllaries in 4 or 5 rows, whitish, tomentose, apex acute; outer phyllaries ovate, 5–7 × 2.5–3 mm; middle phyllaries narrowly ovate-elliptic, 7–10 × 2.5–3.5 mm; inner phyllaries narrowly ovate-elliptic, 10–12 × 1.5–2 mm. Corolla purple, 1.2–1.4 cm, tube 6–8 mm, limb ca. 6 mm. Achene pale brown tinged purple, cylindric, ca. 5 mm, ribbed, apex with a deltate crown. Pappus pale brown; outer bristles 2–3 mm; inner bristles 1–1.1 cm.

- **Fl. and fr. Jul–Sep.**
- **By waterfalls, grasslands, rock crevices; 1500–2600 m. Jilin (Changbai Shan) [Korea, Russia (Far East)].**

### 8. Saussurea sect. Saussurea

风毛菊组  feng mao ju zu

Herbs, perennial, often rhizomatous, usually with well-developed stems, rarely caespitose. Stems solitary, rarely few, ascending to erect, simple to branched, usually leafy. Leaves petiolate or sessile; leaf blade very varied, mostly undivided, sometimes pinnately lobed to pinnatisect, base auriculate, cordate, rounded, truncate, or cuneate, margin entire of dentate, apex rounded to acuminate. Capitula usually several to numerous, in a lax or dense corymbiform, racemiform, or panicleiform synflorescence or sometimes solitary. Involucre cylindrical, narrowly to broadly campanulate, or obconic, medium-sized. Phyllary margin entire or rarely pinnate. Receptacle with subulate bristles. Corolla pink, purple, red, or rarely white, usually glabrous. Anther tails lanceolate. Achene smooth, sometimes ribbed, glabrous. Pappus usually in 2 rows, rarely outer row lacking.

About 160 species: mainly in high mountains and boreal to arctic regions of Asia, Europe, and W North America; 83 species (60 endemic) in China.

1a. Phyllary margins pectinate, with 2–5 pairs of teeth.

2a. Involucre 5–8 mm in diam.; phyllaries with 2 or 3 pairs of teeth; leaves with 8–17 pairs of lobes, lobes oblong to narrowly elliptic-linear .......................................................... 207. *S. odontolepis*

2b. Involucre 8–12 mm in diam.; phyllaries with 3–5 pairs of teeth; leaves with 4–9 pairs of lobes, lobes ovate to narrowly ovate-elliptic .......................................................... 208. *S. pectinata*

1b. Phyllary margins entire or subentire.

3a. Basal and lower stem leaves with a shallowly or deeply cordate base.

4a. Leaf blade adaxially green, abaxially grayish white or grayish green and densely tomentose, arachnoid, or lanate.

5a. Basal and lower stem leaves narrowly ovate-elliptic, 0.7–2.5 cm wide .................................................. 226. *S. graciliformis*

5b. Basal and lower stem leaves 2–17 cm wide.
6a. Lower stem leaves triangular-ovate, base cordate or hastate.
7a. Leaf blade leathery, adaxially pale green or grayish green, sparsely arachnoid floccose, glabrescent; involucre narrowly campanulate, 4–7 mm in diam. .......................................................... 225. S. firma
7b. Leaf blade papery, adaxially white or grayish white, densely tomentose; involucre campanulate, 6–12 mm in diam. .................................................................................................................. 227. S. nivea
6b. Lower stem leaves ovate, ovate-elliptic, or reniform.
8a. Apex of phyllaries without a mucro.
9a. Stem much branched; capitula in paniculiform synflorescence; involucre cylindric, 0.7–0.9 cm in diam. .............................................................................................................. 233. S. pinetorum
9b. Stem apically few branched; capitula in racemiform or lax corymbiform synflorescence; involucre campanulate-obconic, 1.2–1.5 cm in diam. .................................................. 235. S. chetchozensis
8b. Apex of phyllaries with a black mucro.
10a. Stem densely leafy; capitula numerous, in paniculiform to lax corymbiform synflorescence .... 229. S. vestitiformis
10b. Stem with few leaves; capitula few or numerous, in clustered corymbiform synflorescence.
11a. Stem with brown multicellular articulate hairs ................................................................. 230. S. baroniana
11b. Stem white arachnoid or lanate.
12a. Leaf blade 2.5–6 × 2–5 cm; stem slender; involucre obconic to cylindric, 5–6 mm in diam. .... 231. S. flaccida
12b. Leaf blade 3–11 × 7–10(--17) cm; stem stout; involucre campanulate, 6–10 mm in diam. .......................................................... 232. S. acromelaena
4b. Leaf blade green, concolorous or abaxially paler green, abaxially glabrous or glabrescent.
13a. Capitulum usually solitary, terminal on stem, sometimes 2–5, solitary on end of branches; involucre 2–2.5 cm in diam. ............................................................................................................ 209. S. populifolia
13b. Capitula usually numerous or few, rarely solitary; involucre usually less than 2 cm in diam.
14a. Apical part of phyllaries either herbaceous or leathery and saber-shaped, usually patent or reflexed.
15a. Apical part of phyllaries leathery, saber-shaped and reflexed, apex long acuminate.
16a. Leaf blade undivided but margin dentate ........................................................................... 212. S. subtriangulata
16b. Leaf blade pinnately lobed or pinnately dentate.
17a. Capitula numerous, shortly pedunculate; involucre narrowly campanulate, 5–7 mm in diam. .................................................................................................................. 210. S. mongolica
17b. Capitula few, long pedunculate; involucre obconic, 10–15 mm in diam. ......................... 211. S. similata
15b. Apical part of phyllaries herbaceous, not saber-shaped, reflexed, patent, or erect, apex shortly acuminate.
18a. Leaf blade hastate or narrowly cordate, longer than wide.
19a. Capitula 6–12, in paniculiform to corymbiform synflorescence; involucre narrowly campanulate, 0.7–1 cm in diam. .............................................................. 215. S. stricta
19b. Capitula 1–3, long pedunculate, in corymbiform synflorescence; involucre campanulate, 1–2 cm in diam. .............................................................................................................. 216. S. hylolophila
18b. Leaf blade cordate or broadly cordate, ± as long as wide.
20a. Lower and middle stem leaves broadly cordate, 8–20 × 7–18 cm; stem glabrous .................. 213. S. cordifolia
20b. Lower and middle stem leaves ovate-cordate, 5–11 × 5–11 cm; stem with sparse articulate hairs but glabrescent .......................................................... 214. S. oligantha
14b. Apical part of phyllaries neither herbaceous nor leathery and saber-shaped, erect, usually appressed.
21a. Involucre ca. 5 mm in diam.; corolla ca. 8 mm; inner pappus bristles 6–7 mm .................. 221. S. tenerifolia
21b. Involucre 5–15 mm in diam.; corolla 10–16 mm; inner pappus bristles 7–13 mm.
22a. Involucre campanulate to globose, 10–15 mm in diam.
23a. Phyllaries long acuminate .................................................................................................. 223. S. hwangshanensis
23b. Phyllaries acute to obtuse and sometimes mucronate.
24a. Leaf blade sparsely strigose on both surfaces .................................................................. 222. S. grandifolia
24b. Leaf blade abaxially thinly arachnoid tomentose but glabrescent, adaxially sparsely strigose. ........................................................................................................ 219. S. bullockii
22b. Involucre tubular to campanulate, 5–10 mm in diam.
25a. Leaf blade leathery, abaxially grayish green and sparsely arachnoid floccose but glabrescent .... 225. S. firma
25b. Leaf blade papery, abaxially pale green and subglabrous.
26a. Involucre campanulate, 8–10 mm in diam.
27a. Phyllaries appressed, not patent or recurved ................................................................. 220. S. pseudobullockii
27b. Phyllaries apically patent or recurved ............................................................................. 234. S. paleata
26b. Involucre tubular to narrowly campanulate, 5–8 mm in diam.
28a. Plants 30–40 cm tall; stem simple or apically few branched; capitula 3–5, subsessile in a clustered corymbiform synflorescence. .......................................................... 218. S. triangulata
28b. Plants 50–120 cm tall; stem much branched; capitula more numerous, shortly or long pedunculate.

29a. Capitula shortly pedunculate, clustered at end of branches in a corymbiform synflorescence ........................................... 224. S. ussuriensis

29b. Capitula long pedunculate, in a paniculiform synflorescence ........................................... 217. S. manshurica

3b. Basal and lower leaves with an attenuate, cuneate, rounded, truncate, or auriculate-amplexicaul base.

30a. Leaf blade base auriculate and amplexicaul.

31a. Capitula ca. 5, sessile, clustered in a hemispheric synflorescence ......................................................... 236. S. lyratifolia

31b. Capitula either few and long pedunculate or numerous and shortly pedunculate, in a corymbiform synflorescence.

32a. Capitula 1–4, large, long pedunculate, not in a clustered corymbiform synflorescence; involucre 1.2–2 cm in diam.

33a. Leaf blade ovate to narrowly ovate-elliptic, 1.5–5 cm wide .......................................................... 237. S. neofranchetii

33b. Leaf blade narrowly oblanceolate to linear, 1–1.5 cm wide .......................................................... 238. S. caudata

34a. Leaf blade base inconspicuously auriculate.

34b. Leaf blade base broadly auriculate and amplexicaul.

35a. Stem winged; leaf blade abaxially grayish green or grayish white, densely arachnoid tomentose .... 239. S. leclerei

35b. Stem wingless; leaf blade abaxially green, puberulent only on veins ........................................... 240. S. merinoi

36a. All leaves sessile; leaf blade elliptic, 8–23 × 2.5–6 cm .................................................................................. 241. S. macroa

36b. Lower stem leaves petiolate; leaf blade narrowly ovate-elliptic, 6–9 × 2.5–4 cm .......................... 242. S. semiamplexicaulis

38a. Receptacle without bristles ................................................................................................ 178. S. porphyroleuca (see S. sect. Strictae)

38b. Receptacle with bristles.

39a. Leaf blade decurrent on stem; stem winged.

40a. Leaf blade glabrous or subglabrous on both surfaces.

41a. Outer phyllaries acute to obtuse .............................................................................................. 243. S. peduncularis

41b. Outer phyllaries apically with a 3–4 mm subulate awn ................................................................. 244. S. frondosa

40b. Leaf blade adaxially green and glabrous or pubescent, abaxially grayish white and arachnoid or lanate.

42a. Involucre campanulate, 1–1.7 cm in diam. .................................................................................. 245. S. eriocephala

42b. Involucre ovoid or campanulate, 0.5–0.8 cm in diam.

43a. Plants 5–15 cm tall ......................................................................................................................... 261. S. kiraisiensis

43b. Plants 20–90 cm tall.

44a. Stem wings entire; leaf blade ovate, undivided ........................................................................ 228. S. dimorphaeca

44b. Stem wings sinuate-dentate; leaf blade narrowly ovate-elliptic, runcinate-pinnately lobed .................................................................................. 246. S. dzeurensis

39b. Leaf blade not decurrent on stem; stem wingless.

45a. Leaf blade adaxially green and grayish white or grayish green and arachnoid tomentose.

46a. Terminal lobe of leaf blade ovate, base cuneate to subtruncate .... 131. S. flexuosa (see S. sect. Laguranthera)

46b. Terminal lobe of leaf blade ovate-triangular or ovate, base conspicuously cordate.

47a. Stem with few reduced leaves; basal leaves numerous, in a basal rosette .......................................... 198. S. alatipes (see S. sect. Rossulascentes)

47b. Stem with many well-developed leaves; basal leaves few, usually withered at anthesis ........................................................................ 250. S. lamsanamifolia

45b. Leaf blade green, ± concolorous, glabrous or subglabrous.

48a. Capitulum solitary, terminal on stem, or 2–4; phyllaries long acuminate, reflexed ......................... 249. S. morfolia

48b. Capitula numerous, in a racemiform or corymbiform synflorescence; phyllaries not reflexed.

49a. Involucre hemispheric, 2–2.5 cm in diam. .................................................................................. 247. S. carduiformis

49b. Involucre narrowly campanulate, 0.4–0.9 cm in diam. ............................................................. 248. S. mutabilis

37b. Leaf blade undivided or pinnately lobed but not lyrated; petiole without lobes.

50a. Leaf blade pinnately lobed or coarsely pinnately dentate.

51a. Plants 15–35 cm tall; capitulum solitary ............................................................... 286. S. grosseserrata

51b. Plants 40–100 cm tall; capitula 3–5 in a clustered corymbiform synflorescence .......................... 289. S. recurvata

50b. Leaf blade undivided, margin entire, dentate, or shallowly sinuate-dentate.

52a. Leaf blade adaxially green, smooth, and glabrous or scabrous and strigate, abaxially white, grayish white, or grayish green and densely tomentose or thinly arachnoid.
53a. Plants stemless or shortly stemmed, 3–8 cm tall; capitulum solitary; involucre 2–2.5 cm in diam. ................................................................................................................................. 272. S. woodiana

53b. Plants always with a developed stem, more than 10 cm tall; capitula usually several; involucre less than 1.5 cm in diam.

54a. Capitula 1–6.

54b. Capitula numerous, in a racemiform, paniculiform, or corymbiform synflorescence.

55a. Stem and leaf petioles wingless.

55b. Stem and leaf petioles distinctly winged.

56a. Plants 40–65 cm tall; involucre 0.8–1 cm in diam. ............................................................................. 270. S. iodoleuca

56b. Plants 10–30 cm tall; involucre 1–1.2 cm in diam. .......................................................................... 275. S. alaschanica

57a. Plants 30–40 cm tall; leaf blade ovate to elliptic ................................................................. 271. S. smithiana

57b. Plants 10–35 cm tall; leaf blade broadly ovate to orbicular.

58a. Involucre narrowly campanulate to cylindric, 5–7 mm in diam. .............................................. 273. S. komarnitzkii

58b. Involucre ovoid to obconic, ca. 13 mm in diam. ................................................................ 274. S. rotundifolia

59a. Stem wingless.

59b. Stem winged.

60a. Leaf blade orbicular to broadly ovate, abaxially white and densely tomentose .............. 281. S. bulbata

60b. Leaf blade ovate, elliptic, or oblone to narrowly elliptic, abaxially grayish green and arachnoid.

61a. Plants to 1.2 m tall; capitula in a paniculiform to lax corymbiform synflorescence ........ 285. S. undulata

61b. Plants to 70 cm tall; capitula in a clustered corymbiform synflorescence.

62a. Leaf blade ovate to elliptic, adaxially grayish green, and arachnoid floccose ................. 283. S. elliptica

62b. Leaf blade narrowly ovate-elliptic to narrowly elliptic, adaxially green and glabrous.

63a. Plants 30–70 cm tall; leaves and phyllaries usually without glands ................................... 282. S. alpina

63b. Plants 10–20 cm tall; leaves and phyllaries abaxially densely gland-dotted ................. 284. S. pseudoalpina

64a. Capitula 4–10, in a clustered or lax corymbiform or paniculiform synflorescence.

64b. Capitula usually more numerous, in a clustered or lax corymbiform or paniculiform synflorescence.

65a. Stem stout, much branched; leaf blade oblong to narrowly elliptic, less than 2 cm wide ....................................................................................................................... 278. S. platypoda

65b. Stem slender, simple or apically few branched; leaf blade ovate to narrowly elliptic, usually more than 2 cm wide.

66a. Middle stem leaves 2–4 cm wide, apex acuminate.

66b. Middle stem leaves 3–7.5 cm wide, apex acute to obtuse.

66b. Middle stem leaves ovate to elliptic, 5–8 cm ............................................................. 228. S. dimorphaea

67a. Middle stem leaves narrowly elliptic to linear, 10–20 cm ............... 280. S. amurensis

67b. Middle stem leaves ovate to elliptic, 5–8 cm ............................................. 228. S. dimorphaea

68a. Phyllaries yellowish green, apically purplish, densely arachnoid pubescent; outer phyllaries acuminate but without a black mucro; leaf blade apex obtuse to subacute .... 277. S. vestita

68b. Phyllaries straw-colored, brownish, or purple, pubescent or arachnoid; outer phyllaries with a long black mucro; leaf blade apex acute ..................................... 279. S. cauloptera

69a. Capitulum solitary, terminal on stem.

69b. Capitulum green, concolorous, glabrous, sparsely pubescent, or glandular hairy.

70a. Leaf blade margin coarsely sinuate-dentate.

70b. Leaf blade margin entire or inconspicuously denticulate.

71a. Phyllaries not reflexed; leaf blade obovate-elliptic, apex rounded to acute and mucronate ................................................................. 286. S. grosseserrata

71b. Phyllaries reflexed; leaf blade ovate, narrowly ovate-elliptic, or triangular, apex acuminate ................................................................. 288. S. tunglingensis

72a. Plants stemless or with a developed stem; involucre 1.5–4 cm in diam. ........................................... 252. S. superba

72b. Plants always with a developed stem; involucre 1–2 cm in diam.

73a. Leaf blade oblong to broadly linear, margin sinuate .......................................................... 287. S. pratensis

73b. Leaf blade narrowly obovate, narrowly ovate, or narrowly elliptic, margin entire or denticulate.

74a. Leaf blade narrowly oblong to linear, glabrous; phyllaries reflexed ............................... 257. S. undulata

74b. Leaf blade narrowly ovate-elliptic to narrowly elliptic, sparsely villous; phyllaries not reflexed.

75a. Involucre ovoid; phyllaries glabrous; leaf blade margin denticulate ..................... 254. S. acutisquama

75b. Involucre campanulate; phyllaries villous; leaf blade margin entire and densely ciliate.
76a. Leaf blade base oblique and rounded or cuneate, apex obtuse to acute; phyllaries densely villous; corolla 1.8–2.4 cm ................................................................. 251. S. hieracioides
76b. Leaf blade base attenuate, apex acute to acuminate; phyllaries sparsely villous; corolla 1.2–1.4 cm ............................................................................ 253. S. tatsienensis

69b. Capitula 2–6 or numerous, in a corymbiform synflorescence.

78a. Leaf blade margin retrorsely dentate or serrate ................................................. 258. S. retro serrata
78b. Leaf blade margin entire or dentate but not retrorsely so.
79a. Leaf blade broadly ovate to narrowly elliptic, more than 3 cm wide, margin dentate to serrate.
80a. Middle and upper stem leaves narrowly ovate to narrowly elliptic .................... 256. S. hultenii
80b. Middle and upper stem leaves broadly ovate to ovate-elliptic .......................... 255. S. etodonta
79b. Leaf blade narrowly ovate, narrowly elliptical, narrowly oblong, or linear, 0.8–2.5 cm wide, margin entire or denticulate.
81a. Leaf blade narrowly oblong to linear, glabrous; phyllaries reflexed .................. 257. S. microdenia
81b. Leaf blade narrowly ovate-elliptic to narrowly elliptical, sparsely villous; phyllaries not reflexed.
82a. Involucre campanulate; phyllaries villous; leaf blade margin entire and densely ciliate ................................................................. 253. S. tatsienensis
82b. Involucre obconic; phyllaries glabrous; leaf blade margin denticulate .......... 254. S. acutisquama

77b. Capitula numerous.

83a. Phyllaries apicately saber-shaped.
84a. Stem and petioles wingless ................................................................. 262. S. epilobioi des
84b. Stem and petioles narrowly winged.
85a. Leaf blade margin denticulate; involucre 5–6 mm in diam. ................................. 259. S. acuminata
85b. Leaf blade margin dentate; involucre ca. 10 mm in diam. ............................... 263. S. umbrosa
83b. Phyllaries apicately not saber-shaped.

86a. Stem and petioles wingless; leaf blade triangular-ovate to ovate .................... 268. S. dielsiana
86b. Stem and petioles distinctly winged; leaf blade obovate to elliptic or narrowly so.
87a. Leaf blade abaxially glandular; involucre ca. 3 mm in diam.; phyllaries acuminate .... 260. S. glandulosa
87b. Leaf blade abaxially not glandular; involucre 5–8 mm in diam.; phyllaries acute to obtuse.
88a. Leaf blade 3–9 cm wide.
89a. Leaf blade green, concolorous; lower stem leaves with base cordate and apex acute to acuminate ................................................................. 267. S. latifolia
89b. Leaf blade adaxially green, abaxially glaucous-green; lower stem leaves with base attenuate and apex very long acuminate ............................................. 269. S. neoserrata
88b. Leaf blade 1–4 cm wide.
90a. Outer phyllaries with apex acuminate ............................................................ 266. S. candolleiana
90b. Outer phyllaries with apex obtuse or subacute.
91a. Leaf blade of middle stem leaves ovate, base abruptly narrowed into a winged petiole to 5.5 cm; leaf blade adaxially smooth; phyllaries usually yellowish green ... 264. S. hesmsleyi
91b. Leaf blade of middle stem leaves narrowly elliptic, base attenuate into a petiole to 1(–2) cm; leaf blade adaxially scabrid; phyllaries usually dark purple .... 265. S. parviflora


Saussurea aspera Handel-Mazzetti; S. pectinata Bunge ex Candolle var. amurenensis Maximowicz; S. ussurensis Maximowicz var. odontolepis Herder, nom. illeg. superfl.

Herbs 20–100 cm tall, perennial. Stem solitary, erect, apically branched. Basal, lower, and middle stem leaves petiolate; petiole 5–14 cm; leaf blade narrowly ovate-elliptic, 7–21 × 3–12 cm, pinnately lobed to pinnatisect, both surfaces green, adaxially sparsely strigose on veins and usually gland-dotted, adaxially scabrid and densely strigose; lateral lobes 8–17 pairs, oblong to linear-elliptic, margin entire or with 1 or 2 teeth, apex acute; terminal lobe narrowly triangular. Upper stem leaves shortly petiolate, gradually smaller upward on stem. Capitula several, in a corymbiform synflorescence, shortly pedunculate. Involucre narrowly campanulate, 5–8(–10) mm in diam. Phyllaries in 5–7 rows, arachnoid lanate, apex acute to obtuse; outer phyllaries narrowly ovate-triangular, 4.5 × 1–2 mm, usually reflexed, margin with 2 or 3 dark purple subulate teeth; middle phyllaries narrowly ovate-elliptic, 5–7 × 1.5–2 mm, margin entire or with 1 or 2 teeth; inner phyllaries narrowly elliptic-linear, 7–11 × 1.5–2 mm, margin entire. Receptacle bristles 6–7 mm. Corolla purple, 1–1.3 cm, tube 5–7 mm, limb 5–6 mm, lobes 4–5 mm. Achene purplish brown with dark spots, cylindric, 3–5 mm, glabrous. Pappus dirty white; outer bristles 1.5–3 mm; inner bristles (6–)8–9 mm. Fl. and fr. Aug.–Oct. 2n = 26.

Forest margins, grasslands; 100–700 m. Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi [Korea, Mongolia, Russia (Far East)].
208. **Saussurea pectinata** Bunge ex Candolle, Prodr. 6: 538. 1838.

**Saussurea davidii** Franchet; **S. davidii** var. **macrocephala** Franchet; **S. pectinata** var. **macrocephala** (Franchet) Handel-Mazzetti; **S. pectinata** var. **pektinensis** Maximowicz.

Herbs 20–100 cm tall, perennial. Stem solitary, erect, apically branched. Basal and lower stem leaves petiolate; petiole 3.5–9.5(–17) cm; blade blade ovate, ovate-oblong, or elliptic, 5–22 × 2–12 cm, pinnately lobed, abaxially pale green, gland-dotted, and stribose especially on veins but glabrescent, adaxially green, scabrid, and stribose; lateral lobes 4–9 pairs, ovate to narrowly ovate-elliptic, margin sinuate or lobed-dentate, apex acute to obtuse and mucronate. Middle and upper stem leaves shortly petiolate; leaf blade pinnately lobed or undivided and margin entire. Capitula several, in a corymbiform synflorescence, usually long pedunculate. Involucre campanulate, 5–6 cm; leaf blade narrowly triangular-cordate, triangular-ovate, or elliptic, 5–15 × 3–8 cm, pinnately lobed to pinnatisect or undivided, apex acute to obtuse and mucronate. Achene brown, subcylindric, ca. 5 mm, glabrous. Pappus pale brown; outer bristles 1–3 mm, scabrid; inner bristles 1.1–1.3 cm. Fl. and fr. Jul–Oct.


The records of **Saussurea populifolia** from SE Xizang and NW Yunnan are doubtful. These records may belong to one-headed specimens of **S. cordifolia** or **S. oligantha**.


Herbs 30–90 cm tall, perennial. Stem solitary, erect, apically branched, glabrous or sparsely strigose. Lower stem leaves petiolate; petiole 5–16 cm; leaf blade ovate-triangular to ovate, 5–20 × 2–9 cm, pinnately lobed or basal half pinnately lobed and apical part coarsely dentate, abaxially pale green and glabrescent, adaxially green and sparsely strigose but glabrescent, base cordate, apex acute; lateral lobes 1–3 pairs, oblong-elliptic, margin dentate or entire, apex acute to obtuse. Middle and upper stem leaves oblong to narrowly ovate-elliptic, margin coarsely dentate. Capitula numerous, in a corymbiform synflorescence, shortly pedunculate. Involucre narrowly campanulate, 5–7 mm in diam. Phyllaries in 5–7 rows, sparsely arachnoid, apical part saber-shaped and reflexed, apex long acuminate; outer phyllaries ovate, ca. 3 × 1 mm; middle phyllaries narrowly ovate, 7–8 × ca. 2 mm; inner phyllaries narrowly elliptic to linear, ca. 10 × 2 mm. Corolla purplish red, 0.9–1.3 cm, tube 5–6 mm, limb 4–7 mm. Achene brown, cylindrical, 4–5 mm, glabrous. Pappus basally pale brown, apically white; outer bristles ca. 3 mm, scabrid; inner bristles 8–10 mm. Fl. and fr. Jul–Oct. 2n = 26*.

- Mountains, forests, thickets, trailsides, grassy slopes; 500–2900 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi [Korea, Mongolia].

**Saussurea mongolica** var. **rigidior** was described as having pectinate phyllaries just like **S. pectinata**. For these plants from Hebei (Xiaowutai Shan), Handel-Mazzetti (Acta Horti Gothob. 12: 321. 1938) postulated hybrid origin, with **S. mongolica** and **S. pectinata** as parents.


**Saussurea aristata** Lipschütz; **S. stenolepis** Nakai.

Herbs 40–80(–110) cm tall, perennial. Stem solitary, erect, apically branched. Basal and lower stem leaves usually withered at anthesis. Middle stem leaves petiolate; petiole to 14 cm; leaf blade narrowly triangular-cordate, triangular-ovate, or ovate, 5–15 × 3–8 cm, pinnately lobed to pinnatisect or undivi-
ded and margin coarsely dentate; base cordate to truncate, apex acute. Upper stem leaves shortly petiolate, smaller; leaf blade usually undivided, margin dentate to entire, both surfaces green and glabrous. Uppermost stem leaves linear to subulate. Capitula several, in a lax corymbiform or paniculiform synflorescence, long pedunculate. Involucre obconic, (0.5–)1–1.5 cm in diam. Phyllaries in 5 or 6 rows, apical part reflexed, apex long acuminate; outer phyllaries ovate, 5–6 × 1–2 mm; middle phyllaries narrowly ovate-elliptic, ca. 10 × 2 mm; inner phyllaries narrowly elliptic to linear, ca. 15 × 2 mm. Receptacle bristles ca. 7 mm. Corolla purplish red, 1.2–1.5 cm, tube 6–9 mm, limb 5–6 mm. Achene brown, cylindric, 4–7 mm, ribbed. Pappus dirty white; outer bristles 2–3 mm, smooth or scabrid; inner bristles ca. 1 cm. Fl. and fr. Jul–Sep. 2n = 26.

Montane forests, forest margins. Heilongjiang, Jilin, Nei Mongol [Korea, Russia (Far East)].


吉林风毛菊 ji lin feng mao ju

Saussurea eriolepis Bunge ex Candolle var. caudata Herder, S. grandifolia Maximowicz var. caudata (Herder) Komarov.

Herbs 40–80–(100) cm tall, perennial. Stem solitary, slender, erect, many branched, brown arachnoid. Basal and lower stem leaves petiolate; petiole to 12 cm; leaf blade 7–16 × 4–6 cm, base cordate to cuneate, margin dentate, apex acuminate. Middle stem leaves sessile, narrowly obovate to narrowly ovate-elliptic, 6–8 × 0.7–1.2 cm. Upper stem leaves narrowly ovate-elliptic to linear, smaller. Capitula numerous, in a paniculiform synflorescence, long pedunculate. Involucre campanulate, 1–1.5–(2) cm in diam. Phyllaries in 4 or 5–(8) rows, purple, apical part saber-shaped and recurved, apex long acuminate; outer phyllaries triangular, ca. 4 × 1 mm; middle phyllaries elliptic, ca. 7 × 3 mm; inner phyllaries linear-oblong, ca. 11 × 2 mm. Receptacle bristles 1–1.2 cm. Corolla purple, 1.3–1.5–(2) cm, tube 7–9 mm, limb 6–7 mm, lobes ca. 4 mm. Achene blackish brown with dark spots, cylindrical, 3–4 mm, glabrous. Pappus dirty white; outer bristles 3–5 mm, scabrid; inner bristles 1–1.1 cm. Fl. and fr. Jul–Sep. 2n = 26.

Forest margins, forests. Heilongjiang, Jilin [Korea, Russia (Far East)].


心叶风毛菊 xin ye feng mao ju

Saussurea aegirophylla Diels; S. cavalieri H. Léveillé & Vaniot; S. cordifolia var. ombrophila Handel-Mazzetti; S. dutaillyana Franchet.

Herbs 40–150 cm tall, perennial. Stem solitary, erect, apically branched, subglabrous. Basal leaves withered at anthesis. Lower and middle stem leaves petiolate; petiole 8–20 cm; leaf blade cordate, 8–20 × 7–18 cm, both surfaces green, abaxially glabrous or sparsely strigose on veins, adaxially scabrid and sparsely strigose, base deeply cordate, margin coarsely dentate, apex acuminate. Uppermost stem leaves shortly petiolate or sessile; leaf blade ovate, elliptic, or narrowly ovate-elliptic, base rounded to broadly truncate. Capitula usually numerous, in a lax corymbiform synflorescence but rarely solitary, long pedunculate. Involucre campanulate, (0.8–)1.5–2 cm in diam. Phyllaries in 4–6 rows, straw-colored, leathery, conspicuously veined, glabrous or white to brown arachnoid tomentose at margin, apical part green, herbaceous, and reflexed to erect, apex acuminate; outer phyllaries ovate, 2–(4–7) × 2–3 mm; middle phyllaries narrowly ovate, 4–15 × 3–5 mm; inner phyllaries linear, 13–16 × 1.5–2 mm. Receptacle bristles 6–9 mm. Corolla pink to dark purple, (1.2–)1.5–1.7 cm, tube 6–8 mm, limb 8–9 mm, lobes 3–4 mm. Achene brown, cylindric, 5–7 mm, glabrous. Pappus pale brown; outer bristles 2–6 mm, scabrid; inner bristles 1.1–1.5 cm. Fl. and fr. Aug–Oct.

● Montane forests, forest margins; 700–2200 m. Anhui, Chongqing, Guizhou, Henan, Hunbi, Huangxian, Sichuan, Zhejiang.

Saussurea dutaillyana, characterized by dense brown indumentum of articulate hairs on stems and petioles, by basal leaves crowded in a rosette, and by ample lax paniculiform synflorescences, may deserve separate taxonomic status. It has been accepted in several provincial floras and is recorded from Chongqing, Henan, Hubei, S Shaanxi (Qin Ling), Sichuan, and Zhejiang.

The following species, Saussurea oligantha, also belongs to this species group and is not well separated from S. cordifolia.


少花风毛菊 shao hua feng mao ju

Saussurea oligantha var. oligolepis (Y. Ling) X. Y. Wu; S. oligantha var. parvifolia Y. Ling; S. oligolepis Y. Ling.

Herbs 40–70 cm tall, perennial. Stem solitary, erect, simple or apically few branched, with sparse multicellular articulate hairs or glabrescent. Leaves green, sparsely strigose to subglabrous. Basal leaves withered at anthesis. Lower and middle stem leaves petiolate; petiole 9–15 cm, covered with brown articulate hairs or glabrous; leaf blade broadly ovate-cordate, 5–11 × 5–11 cm, base cordate to hasteate, margin coarsely dentate, apex acuminate. Upper stem leaves sessile, narrowly ovate to narrowly elliptic, gradually smaller upward on stem, apex long acuminate. Capitula 2–8, in a lax paniculiform or corymbiform synflorescence or sometimes solitary, long pedunculate. Involucre obconic to campanulate, 1.2–1.5 cm in diam. Phyllaries in 4–6 rows, apical part green, herbaceous, and reflexed to erect, apex acuminate; outer phyllaries ovate, ca. 6 × 2 mm; middle phyllaries oblong to elliptic, 8–10 × 3–3.5 mm; inner phyllaries linear, ca. 10 × 2 mm. Corolla purple, 1.1–1.4 cm, tube 6–7 mm, limb 5–7 mm, lobes 3–3.5 mm. Achene oblong, 3–4 mm, glabrous. Pappus dirty white; outer bristles 3–4 mm, scabrid; inner bristles ca. 9 mm. Fl. and fr. Jul–Sep.

● Mountain slopes, forest margins, forests; 1300–3800 m. Chongqing, Gansu, Henan, Hubei, Shaanxi, Sichuan, SE Xizang, NW Yunnan.


喜林毛毛菊 xi lin feng mao ju

Saussurea subcordata F. H. Chen.

Herbs 75–120 cm tall, perennial. Stem solitary, erect, apically branched, subglabrous. Basal leaves withered at anthesis. Lower and middle stem leaves petiolate; petiole 8–20 cm; leaf blade cordate, 8–20 × 7–18 cm, both surfaces green, abaxially glabrous or sparsely strigose on veins, adaxially scabrid and sparsely strigose, base deeply cordate, margin coarsely dentate, apex acuminate. Uppermost stem leaves shortly petiolate or sessile; leaf blade ovate, elliptic, or narrowly ovate-elliptic, base rounded to broadly truncate. Capitula usually numerous, in a lax corymbiform synflorescence but rarely solitary, long pedunculate. Involucre campanulate, (0.8–)1.5–2 cm in diam. Phyllaries in 4–6 rows, straw-colored, leathery, conspicuously veined, glabrous or white to brown arachnoid tomentose at margin, apical part green, herbaceous, and reflexed to erect, apex acuminate; outer phyllaries ovate, 2–(4–7) × 2–3 mm; middle phyllaries narrowly ovate, 4–15 × 3–5 mm; inner phyllaries linear, 13–16 × 1.5–2 mm. Receptacle bristles 6–9 mm. Corolla pink to dark purple, (1.2–)1.5–1.7 cm, tube 6–8 mm, limb 8–9 mm, lobes 3–4 mm. Achene brown, cylindric, 5–7 mm, glabrous. Pappus pale brown; outer bristles 2–6 mm, scabrid; inner bristles 1.1–1.5 cm. Fl. and fr. Aug–Oct.
Herbs 60–100 cm tall, perennial. Stem solitary, erect, simple or apically branched, subglabrous. Basal leaves usually withered at anthesis. Lower and middle stem leaves petiolate; petiole 2–11 cm; leaf blade ovate-cordate, 5–11 × 3–7 cm, papery, abaxially pale green and striigose, adaxially green and sparsely striigose but glabrescent, base deeply cordate, margin dentate, apex acuminate. Upper stem leaves subsessile; leaf blade narrowly ovate-elliptic, base rounded to attenuate, margin entire or denticulate, apex acuminate. Capitula numerous, in a paniculate or corymbose synflorescence, pedunculate. Involucre narrowly campanulate, 0.8–1.2 cm in diam. Phyllaries in 4 or 5 rows, apically purple, conspicuously 3–5-veined, glabrous or sparsely arachnoid; outer phyllaries broadly ovate, 3–4 × 2–3 mm, patent to recurved, apex rounded and very shortly acuminate; middle phyllaries oblong, 4–8 × 2–3 mm, apex acuminate; inner phyllaries linear, 10–11 × 1–2 mm, apex obtuse and mucronate. Receptacle bristles 7–9 mm. Corolla dark purple, 1–1.2 cm, tube 4–5 mm, limb 6–7 mm, lobes 2–2.5 mm. Achene straw-colored, tinged purple, 6–12 × 4–7(–13) cm, both surfaces green and subglabrous with a few brown articulate hairs, base cordate, margin dentate, apex acuminate. Upper stem leaves subsessile; leaf blade ovate to narrowly ovate-elliptic, base cuneate, margin denticulate or entire, apex acuminate. Lower and middle stem leaves petiolate; petiole 2–13(–18) cm; blade narrowly ovate-elliptic, oblong, or linear, base rounded to attenuate, margin dentate, apex acuminate. Upper stem leaves subsessile; leaf blade ovate-cordate, 6–7 cm, papery, abaxially pale green and strigose, adaxially green, base truncate, cuneate, or rarely truncate, margin sinuate-dentate, apex acute to acuminate. Lower and middle stem leaves ovate to narrowly ovate, smaller. Upper stem leaves sessile, narrowly ovate-elliptic, oblong, or linear, margin entire. Capitula numerous, in a paniculate synflorescence, long pedunculate. Involucre narrowly campanulate, 5–8(–12) mm in diam. Phyllaries in 5–7 rows, straw-colored, apically flushed purple, ± arachnoid, glabrescent, apex obtuse; inner phyllaries broadly ovate, 2–2.5 × 1–1.5 mm; middle phyllaries ovate to narrowly ovate, 3–10 × 1–1.5 mm; inner phyllaries linear, 13–14 × 0.8–1.1 mm. Receptacle bristles to 7 mm. Corolla purple, 1–1.3 cm, tube 5–6 mm, limb 6–7 mm, lobes 3–4 mm. Achene brown, cylindric, 3–5 mm, glabrous. Pappus pale brown; outer bristles 2–4 mm; inner bristles 0.9–1.2 cm. Fl and fr. Jul–Sep. 2m = 26. Mixed or coniferous forests, stony slopes, rock crevices; 900–1500 m. Heilongjiang, Jilin, Liaoning [Korea, Russia (Far East)].


毛苞风毛菊  mao bao feng mao ju

Herbs (25–)50–100 cm tall, perennial. Stem solitary, erect, apically branched, subglabrous. Basal leaves petiolate; petiole 4–14 cm, sparsely stigiose; leaf blade triangular-hastate to rarely ovate or oblong, 6.5–16 × 2–5(–8) cm, thin, papery, both surfaces green, abaxially glabrous, adaxially subglabrous to sparsely stigiose, base cordate, cuneate, or rarely truncate, margin sinuate-dentate, apex acute to acuminate. Lower and middle stem leaves ovate to narrowly ovate, smaller. Upper stem leaves sessile, narrowly ovate-elliptic, oblong, or linear, margin entire. Capitula numerous, in a paniculate synflorescence, long pedunculate. Involucre narrowly campanulate, 5–8(–12) mm in diam. Phyllaries in 5–7 rows, straw-colored, apically flushed purple, ± arachnoid, glabrescent, apex obtuse; inner phyllaries broadly ovate, 2–2.5 × 1–1.5 mm; middle phyllaries ovate to narrowly ovate, 3–10 × 1–1.5 mm; inner phyllaries linear, 13–14 × 0.8–1.1 mm. Receptacle bristles to 7 mm. Corolla purple, 1–1.3 cm, tube 5–6 mm, limb 6–7 mm, lobes 3–4 mm. Achene brown, cylindric, 3–5 mm, glabrous. Pappus pale brown; outer bristles 2–4 mm; inner bristles 0.9–1.2 cm. Fl and fr. Jul–Sep. 2m = 26. Mixed or coniferous forests, stony slopes, rock crevices; 900–1500 m. Heilongjiang, Jilin, Liaoning [Korea, Russia (Far East)].

*Lu Shan feng mao ju*

*Saussurea kwangtungensis* F. H. Chen; *S. tienmoshanensis* F. H. Chen.

Herbs 30–100 cm tall, perennial. Stem solitary, 2–10 mm in diam., erect, apically branched, thinly arachnoid lanate, glabrescent. Lower stem leaves petiolate; petiole 5–17 cm; leaf blade ovate-triangular, 8–15×25–4×14 cm, abaxially pale green and thinly arachnoid tenomentum but glabrescent, adaxially green and sparsely strigose, base cordate, margin sharply sinuate-dentate, apex acuminate. Upper stem leaves shortly petiolate; leaf blade ovate to ovate-triangular, gradually smaller upward on stem. Capitula numerous, in a lax panicleform to corymbiform synflorescence. Involucre campanulate to obconic, 0.8–1.5 cm in diam. Phyllaries in 5 or 6 rows, arachnoid, or glabrescent, margin and apex usually slightly purple; outer phyllaries ovate, 2–3×1.5–2 mm, apex obtuse and mucronate; middle phyllaries oblong to narrowly elliptic, 4–10×ca. 2 mm, apex obtuse; inner phyllaries narrowly oblong, 10–12×1–2 mm, apex obtuse. Corolla purple, 1.3–1.6 cm, minutely gland-dotted, tube 6–9 mm, limb ca. 8 mm, lobes ca. 4 mm. Achene pale brown, cylindrical, 3–4 mm, ribbed, glabrescent, apex with a short crown. Pappus apically white, basally pale brown; outer bristles 2–4 mm, scabrid; inner bristles 1.2–1.3 cm. Fl. and fr. Jul.–Oct.

- Montane forests, meadows, near streams; 800–2100 m. Anhui, Fujian, Guangdong, Hubei, Hunan, Jiangxi, Shaanxi, Zhejiang.


*Taohu feng mao ju*

Herbs 25–40 cm tall, perennial. Stems several, straw-colored, 3–5 mm in diam., erect, apically branched, sparsely arachnoid, glabrescent. Basal leaves almost withered at anthesis. Lower stem leaves petiolate; petiole 1–3 cm; leaf blade narrowly ovate-triangular, 7.5–9.5×2–4 cm, abaxially light green, gland-dotted, and tomentose but glabrescent, adaxially dark green and glabrescent, base shallowly cordate, truncate, or ciliate, margin dentate, apex acute. Middle and upper stem leaves shortly petiolate, smaller, base truncate. Uppermost leaves subsessile; leaf blade narrowly ovate to linear, margin entire. Capitula numerous, in a clustered corymbiform or panicleform synflorescence, shortly pedunculate. Involucre cylindrical or obconic, 8–10 mm in diam. Phyllaries in 4 or 5 rows, arachnoid, apically purplish; outer phyllaries ovate-triangular, 3–4×1.5–2 mm; middle phyllaries ovate-triangular, 4–8×1.8–2.2 mm, apex acuminate and mucronate; inner phyllaries 8–10×1–1.5 mm, apex acute to obtuse. Receptacle bristles subulate, 3–5 mm. Corolla purple to pink, 1.2–1.3 cm, tube 6.5–7 mm, limb 5.5–6 mm, lobes 4–4.5 mm. Achene ca. 3 mm, glabrous, apex with a small crown. Pappus dirty white; outer bristles 2.5–4 mm, scabrid; inner bristles 8–10 mm. Fl. Jul.

- Montane meadows and grasslands; 2700–2800 m. Gansu (Jonê, Lintan).


*Changbai feng mao ju*

Herbs 50–70 cm tall, perennial. Stem solitary, erect, simple or apically branched, glabrous. Basal leaves withered at anthesis. Lower and middle stem leaves petiolate; petiole 7–17 cm; leaf blade ovate-cordate, 9–15×7–9 cm, abaxially pale green and pilose on veins, adaxially green and sparsely strigose but glabrescent, base cordate to hastate, margin dentate, apex acuminate. Upper stem leaves sessile or subsessile; leaf blade ovate to narrowly ovate-elliptic; gradually smaller upward on stem, base rounded to cuneate, margin denticulate or entire, apex acuminate. Capitula 3–14, in a dense corymbiform synflorescence, pedunculate. Involucre cylindric, ca. 5 mm in diam. Phyllaries in ca. 4 rows, straw-colored but purple apically, rigid, leathery, sparsely arachnoid, apex acute to rounded and mucronate; outer phyllaries broadly ovate, 2.3–2.3×3 mm; middle and inner phyllaries elliptic, ca. 5×3 mm. Corolla purple, ca. 8 mm, tube ca. 4 mm, limb ca. 4 mm. Achene cylindrical, ca. 3 mm. Pappus dirty white; outer bristles 1–2 mm, scabrid; inner bristles 6–7 mm. Fl. Jul.

- Montane forests and forest margins; 1100–1700 m. Jilin (Changbai Shan).


*Da ye feng mao ju*

*Saussurea coarctata* (Herder) Kitamura; *S. grandifolia* var. *asperifolia* Herder; *S. grandifolia* var. *coarctata* Herder; *S. grandifolia* var. *tenuior* Herder.

Herbs 35–120 cm tall, perennial. Stem solitary, erect, apically branched, sparsely strigose to subglabrous. Basal leaves withered at anthesis. Lower and middle stem leaves petiolate; petiole 3–9×13 cm; leaf blade cordate-ovate to triangular-ovate, 7–20×4–13 cm, rigid, both surfaces green, scabrid, and sparsely strigose, base shallowly cordate to truncate, margin coarsely dentate, apex acuminate. Upper stem leaves shortly petiolate to subsessile; leaf blade ovate-triangular, ovate-rhombic, or narrowly ovate-elliptic, gradually smaller upward on stem, base cuneate, apex acuminate. Capitula 3–18, in a corymbiform or panicleform synflorescence or rarely solitary, pedunculate. Involucre campanulate, 1.2–1.5 cm in diam. Phyllaries in 5 or 6 rows, arachnoid, apex acute to obtuse and mucronate; outer phyllaries ovate-elliptic, 3–5×2–3 mm; middle phyllaries elliptic, 5–8×2–3 mm; inner phyllaries linear, 8–12×1.5–2 mm. Receptacle bristles 7–8 mm. Corolla dull red, 1.3–1.5 cm, tube 6–8 mm, limb 6–7 mm, lobes 4–5 mm. Achene straw-colored, cylindrical, 4–5 mm, glabrous. Pappus dirty white; outer bristles 1–2 mm, scabrid; inner bristles 0.9–1.1 mm. Fl. and fr. Aug.–Oct. 2n = 26.

Fruits, forest margins, meadows, mountain slopes; 200–1100 m. Heilongjiang, Jilin, Liaoning [Korea, Russia (Far East)].


*Huangshan feng mao ju*
Saussurea sinuata Komarov var. cordata F. H. Chen.

Herbs to 50 cm tall, perennial. Stem solitary, erect, apically branched, glabrous. Basal leaves withered at anthesis. Lower and middle stem leaves petiolate; petiole 4–16 cm; leaf blade ovate-cordate, 8–17 × 6–12 cm, both surfaces green, abaxially glabrous, adaxially sparsely strigose, base cordate, margin coarsely dentate, apex acuminate. Upper stem leaves shortly petiolate to sessile; leaf blade ovate, gradually smaller upward on stem. Capsule 4–8, in a corymbiform synflorescence, pedunculate. Involucre campanulate to globose, 1–1.5 cm in diam. Phyllaries in 4 or 5(–7) rows, straw-colored, basally leathery, apically herbaceous, purplish and densely white arachnoid, and patent to recurved, apex long acuminate; outer phyllaries narrowly triangular-ovate, 4–6 × ca. 2(–3) mm; middle phyllaries narrowly elliptic, 6–10 × ca. 2 mm; inner phyllaries narrowly linear-elliptic, 10–14 × 1.5–2 mm. Receptacle bristles to 5 mm. Corolla purplish red, 1.2–1.5 cm, tube 6–9 mm, limb 5–6 mm, lobes 3.5–4 mm. Achenes purplish brown, cylindric, 3.5–4 mm, glabrous. Pappus pale brown to dirty white; outer bristles 2–3 mm, scabrid; inner bristles 9–10 mm. Fl. and fr. Aug–Sep.

- Forests, grasslands; 1000–1700 m. Anhui (Huang Shan), Zhejiang.


乌苏里风毛菊 wu su li feng mao ju

Saussurea ussuriensis var. incisa Maximowicz; S. ussuriensis var. laxiodontolepis Q. Z. Han & Shu Y. Wang; S. ussuriensis var. pinnatifida Maximowicz.

Herbs 30–120 cm tall, perennial. Stem solitary, erect, apically branched. Basal and lower stem leaves petiolate; petiole 3.5–20 cm; leaf blade ovate or oblong, 6–18 × 2.5–6[–10] cm, pinnately lobed or unlobied, both surfaces green, ± concolorous, usually gland-dotted, and sparsely strigose but glabrescent, base cordate to truncate, apex acuminate; lower lobes 3–7 pairs, triangular-oblong, margin entire or coarsely dentate. Middle and upper stem leaves shortly petiolate; leaf blade oblong to linear, gradually smaller upward on stem. Capsules numerous, clustered at end of branches in a corymbiform synflorescence, shortly pedunculate. Involucre narrowly campanulate, 5–8 mm in diam. Phyllaries in 5–7 rows, margin and apically usually purplish, arachnoid to glabrescent, apex acuminate to acute; outer phyllaries ovate, 2–3 × 0.5–1 mm; middle phyllaries oblong, 3–9 × 1.5–2 mm; inner phyllaries linear, 9–11(–14) × 1–1.5 mm. Receptacle bristles 5–6 mm. Corolla purplish red, 1–1.3 cm, tube 5–6 mm, limb 5–5.5 mm, lobes 3.5–4 mm. Achenes pale brown with dark spots, 4–5 mm, glabrous, apex with a short crown. Pappus straw-colored; outer bristles 2–4 mm, scabrid; inner bristles 7–9 mm. Fl. and fr. Jul–Sep. 2n = 26.

Montane forests, thickets, grasslands, by rivers, ravines; 1100–2900 m. Gansu, Hebei, Heilongjiang, Henan, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi [Japan, Korea, Mongolia, Russia (Far East)].

A single plant of Saussurea ussuriensis from Liaoning has been described as S. ussuriensis var. laxiodontolepis. The description matches the typical variety of S. ussuriensis, except for the dentate phyllaries, which may be the result of introgression from S. odontolepis or S. pectinata. Also, Lipschitz (Fl. URSS 27: 448. 1962) reported hybrids of S. ussuriensis with S. odontolepis.


硬叶风毛菊 ying ye feng mao ju


Herbs 30–80 cm tall, perennial. Stem solitary, erect or ascending, simple or apically branched. Basal and lower stem leaves petiolate; petiole 3–12 cm; leaf blade ovate to elliptic, 3–12 × 2–6 cm, leathery, abaxially grayish green to grayish white and sparsely arachnoid to densely tomentose, adaxially green, gland dotted, and subglabrous, base cordate to truncate, margin denticulate, apex acute to acuminate. Middle and upper stem leaves smaller upward on stem; leaf blade narrowly ovate-elliptic to linear. Capsules numerous, in a corymbiform synflorescence, pedunculate. Involucre narrowly campanulate, 4–7(–10) mm in diam. Phyllaries in 5–7 rows, straw-colored but apically usually purple, sparsely arachnoid, glabrescent, apex acute to subacute or shortly mucronate; outer phyllaries ovate, 2–3 × 1–2 mm; middle phyllaries narrowly oblong, 3–6 × 1–1.5 mm; inner phyllaries linear, 6–8 × 1–1.5 mm. Corolla purple, 1–1.2 cm, tube 5–6 mm, limb 5–6 mm, lobes ca. 4 mm. Achenes 4–9 mm, glabrous. Pappus white; outer bristles 1–2 mm, scabrid; inner bristles 8–10 mm. Fl. and fr. Jul–Sep. 2n = 26.

Grasslands on mountain slopes, ravines; 1100–1800 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol [Russia (Far East)].

For Saussurea firma, the name S. discolor was misapplied by C. Y. Li (Fl. Liaoning. 2: 593. 1992) and W. Wang and C. Y. Li (Fl. Pl. Herb. Chin. Bor.-Orient. 9: 339. 2004). Saussurea discolor is a distinct taxon from the mountains of C Europe and is not present in Asia.


纤细风毛菊 xian xi feng mao ju

Herbs 10–40 cm tall, perennial. Stem solitary, slender, erect, apically few branched, subglabrous. Basal and lower stem leaves petiolate; petiole 1.5–8 cm; leaf blade ovate to narrowly ovate-elliptic, 1–11 × 0.7–2.5 cm, thick, abaxially grayish white and densely tomentose, adaxially green and glabrous, base shallowly cordate to truncate, margin sinuate and denticulate, apex acute. Middle stem leaves gradually smaller upward on stem. Upper stem leaves narrowly elliptic to linear. Capsules 2–5, in a clustered corymbiform synflorescence, shortly pedunculate to sessile. Involucre narrowly cylindric, 4–6(–10) mm in diam. Phyllaries in ca. 5 rows, thin, glabrous, apex acute; outer phyllaries ovate, 3–5 × ca. 1.5 mm, apex mucronate; middle phyll-

Saussurea komaroviana (Turczaninow) Franchet, J. Bot. (Morot) 8: 340. 1894.

Saussurea dimorphae Franchet, J. Bot. (Morot) 8: 340. 1894.


Saussurea broussonetifolia F. H. Chen; S. rafotricha Y. Ling.

Herbs 20–60 cm tall, perennial. Stem solitary, erect, apically branched, densely leafy, apically arachnoid tomentose. Basal and lower stem leaves petiolate; petiole 10–13 cm; leaf blade ovate, 6–13 × 3.5–8.5 cm, thick, abaxially grayish green to grayish white and densely tomentose, adaxially green and sparsely arachnoid but glabrescent, base deeply cordate, margin sinuate-denticulate, apex acute. Middle stem leaves petiolate; leaf blade base truncate, rounded, or cuneate. Upper stem leaves sessile, narrowly elliptic to ovate-elliptic, gradually smaller upward on stem. Capitula numerous, in a paniculiform or laxy corymbiform synflorescence, pedunculate. Involucre campanulate, 8–10 mm in diam. Phyllaries in 5 or 6 rows, pale yellow sericeous, apex obtuse to rounded and with a black mucro; outer phyllaries narrowly ovate, 2–3 × 1–1.5 mm; middle phyllaries narrowly ovate-elliptic, 5–7 × ca. 1 mm; inner phyllaries linear, 8–10 × ca. 1 mm. Corolla pale purple, ca. 1.2 cm. Achene obconic, glabrous. Pappus straw-colored; outer bristles simple, ca. 1/4 as long as inner ones. Fl. and fr. Aug–Sep.

Montane forests and grasslands; ca. 2900 m. NW Yunnan (Lijiang, Zhongdian).


Herbs 30–70 cm tall, perennial. Stem solitary, erect, apically branched, densely leafy, apically arachnoid tomentose. Basal and lower stem leaves petiolate; petiole 10–13 cm; leaf blade ovate, 6–13 × 3.5–8.5 cm, thick, abaxially grayish green to grayish white and densely tomentose, adaxially green and sparsely arachnoid but glabrescent, base deeply cordate, margin sinuate-denticulate, apex acute. Middle stem leaves petiolate; leaf blade base truncate, rounded, or cuneate. Upper stem leaves sessile, narrowly elliptic to ovate-elliptic, gradually smaller upward on stem. Capitula numerous, in a paniculiform or laxy corymbiform synflorescence, pedunculate. Involucre campanulate, 8–10 mm in diam. Phyllaries in 5 or 6 rows, pale yellow sericeous, apex obtuse to rounded and with a black mucro; outer phyllaries narrowly ovate, 2–3 × 1–1.5 mm; middle phyllaries narrowly ovate-elliptic, 5–7 × ca. 1 mm; inner phyllaries linear, 8–10 × ca. 1 mm. Corolla pale purple, ca. 1.2 cm. Achene obconic, glabrous. Pappus straw-colored; outer bristles simple, ca. 1/4 as long as inner ones. Fl. and fr. Aug–Sep.

Montane forests and grasslands; ca. 2900 m. NW Yunnan (Lijiang, Zhongdian).


leaves shortly petiolate to subsessile, gradually smaller upward on stem; leaf blade ovate, base cuneate. Capitula 2 or 3 clustered at end of branches, in a corymbiform synflorescence, shortly pedunculate. Involucre narrowly campanulate to ovoid, 6–10 mm in diam. Phyllaries in 6 or 7 rows, arachnoid; outer phyllaries ovate-triangular, leathery, apically black, apex mucronate; inner phyllaries oblong to narrowly ovate-elliptic, api- cally purple, apex obtuse. Corolla purple, ca. 1.1 cm. Achene ca. 5 mm, glabrous. Pappus grayish white to pale brown; outer bristles scabrid. Fl. and fr. Aug–Oct.

- Montane forests, forest margins; 2200–2800 m. S Shaanxi (Qin Ling).


*Song Lin Feng Mao Ju* song lin feng mao ju

*Saussurea ionodasys* Herder.

Herbs 25–50 cm tall, perennial. Stem solitary, slender, erect, simple or apically few branched, sparsely arachnoid. Bas- al and lower stem leaves petiolate; petiole 6–13 cm; leaf blade ovate to broadly ovate, 2.5–6 × 2–5 cm, thinly papery, abaxially grayish white and densely white tomentose, adaxially green, scabrid, and densely strigose, base cordate, margin sinuate-dentate to denticulate. Leaf blade erect, simple or apically few branched, sparsely arachnoid. Basal and lower stem leaves petiolate; petiole 6–13 cm; leaf blade ovate to broadly ovate, 2.5–6 × 2–5 cm, thinly papery, abaxially grayish white and densely white tomentose, adaxially green, scabrid, and densely strigose, base cordate, margin sinuate-dentate to denticulate. Upper stem leaves shortly petiolate to subsessile, gradually smaller upward on stem; leaf blade narrowly ovate-elliptic to oblong. Capitula 2–4, in a corymbiform synflorescence or sometimes solitary, pedunculate. Involucre obconic to oblong, 5–6 mm in diam. Phyllaries in ca. 4 rows, rigid, leathery, densely arachnoid, apex with a blackish purple muro; outer phyllaries ovate-triangular, ca. 3 × 2 mm, apex acute; middle phyllaries elliptic, ca. 6 × 2 mm, apex obtuse; inner phyllaries broadly linear, ca. 7 × 1 mm, apex acute. Corolla pale yellowish brown, ca. 1 cm, tube ca. 5 mm, limb ca. 5 mm. Achene cylindrical, ca. 5 mm, ribbed, glabrous. Pappus straw-colored; outer bristles 2–3 mm, scabrid; inner bristles ca. 8 mm. Fl. and fr. Aug–Sep.

- Montane grasslands, thickets; 2700–2800 m. S Shaanxi (Qin Ling).


*Song Lin Feng Mao Ju* song lin feng mao ju


Herbs 40–50 cm tall, perennial. Stem solitary, stout, erect, apically branched, sparsely lanate. Basal and lower stem leaves petiolate; petiole 6–12 cm; leaf blade broadly ovate, cordate, or reniform, 3–11 × 7–10 (–17) cm, abaxially grayish white and densely lanate, adaxially yellowish green and glabrous or sparsely pilose, base cordate, margin dentate, apex rounded to emarginate. Middle and upper stem leaves petiolate; petiole 0.5–5 cm; leaf blade ovate, triangular-ovate, or ovate-elliptic, gradually smaller upward on stem, base cordate, truncate, or cuneate, apex acute to acuminate. Capitula numerous, in a corymbiform synflorescence. Involucre campanulate, 6–10 mm in diam. Phyllaries in ca. 5 rows, leathery, densely white lanate, apex with a blackish purple muro; outer phyllaries ovate, ca. 4 × 3 mm; middle phyllaries oblong, ca. 7 × 3 mm; inner phyllaries oblong to narrowly elliptic-linear, 8–10 × 1–2.5 mm. Corolla pale purple, 1–1.2 cm, tube 5–6 mm, limb 4–5 mm, lobes 3–4 mm. Achene brown, cylindrical, 4–5 mm, glabrous. Pappus pale brown; outer bristles 2–3 mm, scabrid; inner bristles 8–9 mm. Fl. and fr. Sep–Oct.

- Montane forests; 1400–2500 m. Hebei, Henan, W Hubei, Shaanxi.


松林风毛菊

*Saussurea ionodasys* Handel-Mazzetti.

Herbs 30–50 cm tall, perennial. Stem solitary, erect, branched, narrowly winged, with rusty multicellular articulate hairs. Basal and lower stem leaves petiolate; petiole 1.5–3 cm, winged, wing margin sparsely dentate or entire; leaf blade oblong to ovate, 3–10 × 2.5–6 cm, abaxially grayish white and densely tomentose, adaxially green, scabrid, and with rust-colored multicellular articulate hairs, base subcordate to truncate, margin dentate, apex rounded, obtuse, or acute. Middle stem leaves shortly petiolate to sessile; petiole if present winged, wings or leaf base decurrent on stem; leaf blade oblong, narrowly ovate-elliptic, or linear, smaller upward on stem. Capitula 2–12 at end of branches, in a corymbiform or paniculiform synflorescence, pedunculate. Involucre cylindrical, 7–9 mm in diam. Phyllaries in ca. 5 rows, subglabrous, apex subacute to rounded; outer phyllaries ovate, 2.8–3 × 1.5 mm; middle phyllaries narrowly elliptic, 5.8–1.8–2 mm; inner phyllaries linear, ca. 9 × 1 mm. Corolla purple, ca. 1 cm, tube ca. 5 mm, limb ca. 5 mm. Achene pale brown, 2–3 mm, glabrous. Pappus white; outer bristles ca. 2 mm, scabrid; inner bristles ca. 9 mm. Fl. and fr. Jul–Sep.

- Pinus forests, grassy slopes; 1900–3800 m. NE Chongqing, W Sichuan, NW Yunnan (Lijiang).


膜片风毛菊 mo pian feng mao ju

?*Saussurea corymbosa* F. H. Chen; *S. eriolepis* Bunge ex Candolle var. *paleata* (Maximowicz) Herder.

Herbs to 60 cm tall, perennial. Stem solitary, erect, apically branched, arachnoid or glabrescent. Basal and lower stem leaves petiolate; petiole 5–7 cm; leaf blade broadly ovate-cordate to oblong-cordate, 6–8 × 4–5 cm, abaxially grayish green and thinly arachnoid tomentose, adaxially green and glabrous, base cordate, margin serrate to dentate, apex acuminate. Middle stem leaves petiolate; leaf blade ovate to narrowly ovate-elliptic, gradually smaller upward on stem. Upper stem leaves shortly petiolate to subsessile; leaf blade narrowly ovate-elliptic to linear, apex acute. Capitula several, in a paniculiform or corymbiform synflorescence, pedunculate. Involucre campanulate, 7–10 mm in diam. Phyllaries in 3 or 4 rows, apically purplish red, arachnoid near margin, apex acute; outer phyllaries triangular, ca. 3 × 1 mm; middle phyllaries oblong, 3–6 ×
1–1.5 mm; inner phyllaries narrowly ovate, 12–20 × ca. 2 mm. Achene brown, 1–1.5 mm, apex obtuse. Corolla bluish purple, 1.3–1.4 cm, tube 6–7 mm, limb 6.5–7 mm, lobes 3–3.5 mm. Achene brown, ca. 2 mm, smooth, glabrous, apex with a denticulate crown. Pappus brown; outer bristles short, scabrid; inner bristles plumose. Fl. and fr. Jul–Aug.

- Montane forests; ca. 3800 m. SE Xizang (Bomi).

**Saussurea lyratifolia** was placed in *S. subg. Froловia* by C. Shih and S. Y. Jin (FRPS 78(2): 58. 1999). As all other former members of this subgenus are now accommodated in different genera, *S. lyratifolia* is now placed in *S. subg. Saussurea*. The typical double pappus and the capitula and synflorescence structure leave no doubt that this species belongs to *Saussurea* s.s. and not to one of the segregates. It is very similar to *S. laneana* W. W. Smith from India (Sikkim). Further studies are needed to investigate if this is indeed the same species.


**耳叶风毛菊** er ye feng mao ju


Herbs 50–100 cm tall, perennial. Stem solitary, erect, simple or apically few branched, glabrous. Basal leaves petiolate, sometimes withered at anthesis; petiole to 12 cm; leaf blade ovate to narrowly ovate-elliptic, 5.5–15 × 1.5–5 cm, abaxially pale green, often tinged purple, and glabrous, adaxially dark green and glabrous, base cuneate-attenuate, margin serrulate, apex acute. Lower, middle, and upper stem leaves usually sessile, gradually smaller upward on stem; leaf blade narrowly ovate-elliptic to oblong, to 15 × 3 cm, usually with a dark mucro; middle phyllaries narrowly ovate-elliptic; inner phyllaries narrowly oblong. Receptacle bristles ca. 4 mm. Corolla purplish red, 1.1–1.2 cm, tube 4.5–5 mm, limb 3.5–4 mm, lobes ca. 2 mm. Achene cylindrical, ca. 2 mm, smooth, glabrous, apex with a denticulate crown. Pappus brown; outer bristles short, scabrid; inner bristles plumose. Fl. and fr. Jul–Aug.


**大头羽裂风毛菊** da tou yu lie feng mao ju


**耳叶风毛菊** er ye feng mao ju


Herbs 50–100 cm tall, perennial. Stem solitary, erect, simple or apically few branched, glabrous. Basal leaves petiolate, sometimes withered at anthesis; petiole to 12 cm; leaf blade ovate to narrowly ovate-elliptic, 5.5–15 × 1.5–5 cm, abaxially pale green, often tinged purple, and glabrous, adaxially dark green and glabrous, base cuneate-attenuate, margin serrulate, apex acute. Lower, middle, and upper stem leaves usually sessile, gradually smaller upward on stem; leaf blade narrowly ovate-elliptic to oblong, to 15 × 3 cm, usually with a dark mucro; middle phyllaries narrowly ovate-elliptic; inner phyllaries narrowly oblong. Receptacle bristles ca. 4 mm. Corolla purplish red, 1.1–1.2 cm, tube 4.5–5 mm, limb 3.5–4 mm, lobes ca. 2 mm. Achene cylindrical, ca. 2 mm, smooth, glabrous, apex with a denticulate crown. Pappus brown; outer bristles short, scabrid; inner bristles plumose. Fl. and fr. Jul–Aug.


**大头羽裂风毛菊** da tou yu lie feng mao ju


Herbs 50–100 cm tall, perennial. Stem solitary, erect, simple or apically few branched, glabrous. Basal leaves petiolate, sometimes withered at anthesis; petiole to 12 cm; leaf blade ovate to narrowly ovate-elliptic, 5.5–15 × 1.5–5 cm, abaxially pale green, often tinged purple, and glabrous, adaxially dark green and glabrous, base cuneate-attenuate, margin serrulate, apex acute. Lower, middle, and upper stem leaves usually sessile, gradually smaller upward on stem; leaf blade narrowly ovate-elliptic to oblong, to 15 × 3 cm, usually with a dark mucro; middle phyllaries narrowly ovate-elliptic; inner phyllaries narrowly oblong. Receptacle bristles ca. 4 mm. Corolla purplish red, 1.1–1.2 cm, tube 4.5–5 mm, limb 3.5–4 mm, lobes ca. 2 mm. Achene cylindrical, ca. 2 mm, smooth, glabrous, apex with a denticulate crown. Pappus brown; outer bristles short, scabrid; inner bristles plumose. Fl. and fr. Jul–Aug.


**大头羽裂风毛菊** da tou yu lie feng mao ju


Herbs 50–100 cm tall, perennial. Stem solitary, erect, simple or apically few branched, glabrous. Basal leaves petiolate, sometimes withered at anthesis; petiole to 12 cm; leaf blade ovate to narrowly ovate-elliptic, 5.5–15 × 1.5–5 cm, abaxially pale green, often tinged purple, and glabrous, adaxially dark green and glabrous, base cuneate-attenuate, margin serrulate, apex acute. Lower, middle, and upper stem leaves usually sessile, gradually smaller upward on stem; leaf blade narrowly ovate-elliptic to oblong, to 15 × 3 cm, usually with a dark mucro; middle phyllaries narrowly ovate-elliptic; inner phyllaries narrowly oblong. Receptacle bristles ca. 4 mm. Corolla purplish red, 1.1–1.2 cm, tube 4.5–5 mm, limb 3.5–4 mm, lobes ca. 2 mm. Achene cylindrical, ca. 2 mm, smooth, glabrous, apex with a denticulate crown. Pappus brown; outer bristles short, scabrid; inner bristles plumose. Fl. and fr. Jul–Aug.


**大头羽裂风毛菊** da tou yu lie feng mao ju
mm. Corolla purplish red, 1.4–1.6 cm, tube 7–8 mm, limb 7–8 mm, lobes 4–5 mm. Achene blackish brown, cylindric, 4–5 mm, ribbed, glabrous, apex with a short crown. Pappus straw-colored to reddish; outer bristles scabrid. Fl. and fr. Jul–Aug.

- Forest margins, thickets, montane grasslands; 3000–3800 m. W Sichuan, NW Yunnan (Lijiang, Zhongdian).

_Saussurea neofranchetti_ was described from a specimen without basal leaves. Whereas the lower stem leaves can either be sessile or petiolate, the basal leaves are always distinctly petiolate.


尾叶风毛菊 weiyefengmaju

Herbs 20–85 cm tall, perennial. Stem solitary, purple, erect, simple or apically few branched, glabrous. Basal leaves petiolate; petiole 7–9 cm; leaf blade narrowly ovate-elliptic to oblong, 8–15 × 1–1.5 cm, abaxially pale green, glabrous, axially green and glabrous or sparsely strigose on veins, base cuneate-attenuate, margin serrulate-denticulate, apex caudate- acuminate. Lower stem leaves broadly linear, base attenuate into a winged petiole, apex caudate-acuminate. Middle and upper stem leaves sessile, narrowly ovate-elliptic to oblanceolate, basally slightly narrowed, base auriculate and amplexicaul, apex caudate-acuminate. Capitals 2–4, terminal on stems or branches in a lax corymbiform synflorescence or sometimes solitary, long pedunculate. Involucrums campanulate, 1.2–2 cm in diam. Phyllaries in 4 or 5 rows, leathery; outer phyllaries ovate, 8–9 × 4–7 mm, apex acuminated and reflexed; middle phyllaries oblong, ca. 12 × 4 mm; inner phyllaries linear, ca. 15 × 2 mm, apex acute. Corolla purple, ca. 1.6 cm, tube ca. 9 mm, limb ca. 6 mm. Achene cylindrical, ca. 3 mm, ribbed, glabrous. Pappus dirty white; outer bristles ca. 3 mm; inner bristles ca. 1.3 cm. Fl. and fr. Jul–Sep.

- Forest margins, meadows, open rocky pastures; 3000–4000 m. W Sichuan, NW Yunnan (Zhongdian).


耳叶风毛菊 erye fengmaju

_Saussurea mollis_ Franchet; (Cav.) Sprengel (1826).

Herbs to 1 m tall, perennial. Stem solitary, erect, apically branched, not winged, glabrous. Basal and lower stem leaves usually withered at anthesis. Middle and upper stem leaves shortly petiolate; petiole 3–4 cm; leaf blade ovate, elliptic, or oblong, 6–10 × 2–3.5 cm, surfaces dark green and ± concolorous, abaxially puberulent on veins, axially glabrous, base truncate to cuneate, margin sinuata- denticulate, apex caudate-acuminate. Upper stem leaves sessile, ovate-elliptic to narrowly ovate-elliptic, smaller. Capitals numerous, in a clustered corymbiform synflorescence at end of stem and branches, shortly pedunculate. Involucrums narrowly campanulate, 4–6 mm in diam. Phyllaries in ca. 5 rows, brown, glabrous; outer phyllaries ovate, 2–3 × 1–1.5 mm, apex acute; middle phyllaries ovate, 3–6 × 1–2 mm, apex obtuse; inner phyllaries linear, 6–8 × 1–1.5 mm, apex rounded. Corolla purple, 8–9(–12) mm, tube 3–5 mm, limb 4.5–5 mm, lobes ca. 3 mm. Achene cylindrical, ca. 3 mm, glabrous. Pappus pale brown; inner bristles 7–8 mm. Fl. and fr. Aug–Oct.

- Montane grasslands; 2000–3300 m. Chongqing, Hubei, Sichuan, NC Yunnan.


截叶风毛菊 jiye fengmaju

Herbs to 1 m tall, perennial. Stem solitary, erect, apically branched, not winged, glabrous. Basal and lower stem leaves usually withered at anthesis. Middle stem leaves shortly petiolate; leaf blade ovate, elliptic, or oblong, 6–10 × 2–3.5 cm, surfaces dark green and ± concolorous, abaxially puberulent on veins, axially glabrous, base truncate to cuneate, margin sinuate-denticulate, apex caudate-acuminate. Upper stem leaves sessile, ovate-elliptic to narrowly ovate-elliptic, smaller. Capitals numerous, in a clustered corymbiform synflorescence at end of stem and branches, shortly pedunculate. Involucrums narrowly campanulate, 4–6 mm in diam. Phyllaries in ca. 5 rows, brown, glabrous; outer phyllaries ovate, 2–3 × 1–2 mm, apex acuminate; middle phyllaries ovate-elliptic, 3–6 × 1.5–2 mm, apex subacute; inner phyllaries linear, 7–10 × 1–1.5 mm, apex subacute. Corolla purple, 8–10 mm, tube 3.5–5 mm, limb 4.5–5 mm, lobes ca. 3 mm. Achene brown, cylindric, ca. 4 mm, glabrous. Pappus pale reddish brown; outer bristles 0.2–3 mm; inner bristles 7–8 mm. Fl. and fr. Aug–Oct.

- Montane grasslands; ca. 3200 m. NE Yunnan (Qiaojia).

Apparently, _Saussurea merinoi_ is only known from the type specimens, which lack the basal and underground parts of the plants. This species is probably close to _S. leclerei_.

241. _Saussurea macrota_ Franchet, J. Bot. (Morot) 8: 343. 1894.

大耳叶风毛菊 daeryefengmaju

_Saussurea auriculata_ Hemsley (1892), not (Candolle) Schultz Bipontinus (1846), nor (Franchet) (1887); _S. hemsleyana_ Handel-Mazzetti; _S. kitamurae_ S. Y. Hu; _S. macroa var. papparacea_ Lipschitz; _S. otophylla_ Diels; _S. otophylla_ var. _cinerea_ Y. Ling.

Herbs 25–85 cm tall, perennial. Stem solitary, erect, apically branched, apically flexuous, wingless, subglabrous. Basal leaves withered at anthesis. Lower and middle stem leaves sessile, elliptic to ovate-elliptic, 8–23 × 2.5–6 cm, abaxially sparsely arachnoid or glabrous and sometimes gland-dotted, adaxially green and sparsely strigose or glabrous, base auriculate and amplexical, margin denticulate to coarsely serrate, apex acute to acuminate. Upper stem leaves narrowly ovate to narrowly elliptic, gradually smaller upward on stem. Capsules numerous, in a clustered corymbiform synflorescence at end of stem and branches, shortly pedunculate. Involucrums narrowly campanulate, 6–10 mm in diam. Phyllaries in 5 or 6 rows, brownish, apically and near margin purple, glabrous or sparsely arachnoid; outer phyllaries ovate, 3–4 × 2–2.5 mm, apex usually obtuse; middle phyllaries narrowly ovate, 5–11 × 1.5–3 mm, apex obtuse to acute; inner phyllaries linear, 11–13 × 1.5 mm, apex linear, 6–8 × 1–1.5 mm, apex rounded. Corolla purple, 8–9(–12) mm, tube 3–5 mm, limb 4.5–5 mm, lobes ca. 3 mm. Achene cylindrical, ca. 3 mm, glabrous. Pappus pale brown; inner bristles 7–8 mm. Fl. and fr. Aug–Oct.
subacut. Corolla dark purple, 1–1.2 cm, tube 5–6 mm, limb 5–7 mm, lobes 3–3.5 mm. Achene cylindric, 3–4.5 mm, ribbed, glabrous. Pappus pale brown; outer bristles 1.5–3 mm, scabrid; inner bristles 8–10 mm. Fl. and fr. Jul–Aug.

- Montane forests, thickets; 2200–3300 m. N Chongqing, Gansu, W Hubei, Ningxia, Shaanxi, Sichuan.


半抱茎风毛菊 ban bao jing feng mao ju

Herbs 50–70 cm tall, perennial. Stem solitary, erect, apically branched, wingless, with brown articulate hairs. Leaves green and golden gland-dotted, margin dentate-denticulate. Lower stem leaves petiolate; petiole 3–5 cm, winged, base enlarged, auriculate, and semiamplexicaul; leaf blade narrowly ovate-elliptic, 6–9 × 2.5–4 cm, both surfaces green, abaxially gland-dotted and sparsely arachnoid, adaxially ± sparsely gland-dotted and glabrous, base subcordate to truncate, apex acute. Middle and upper stem leaves sessile, gradually smaller upward on stem, base auriculate and semiamplexicaul. Capitula numerous, to 4–10 in a clustered corymbiform synflorescence upward on stem, base auriculate and semiamplexicaul. Capitula numerous, to 4–10 in a clustered corymbiform synflorescence, pedunculate. Involucre ovoid to narrowly campanulate, 5–7(–10) mm in diam. Phyllaries in 5 or 6 rows, brown, leathery, glabrous, apex obtuse to acuminate; outer phyllaries ovate, 3–4 × 2–2.5 mm; middle phyllaries narrowly ovate, 4–8 × 1.5–2 mm, apex acute to obtuse; inner phyllaries linear, 8–10 × 1.5–1.15 mm. Receptacle bristles 5–7 mm. Corolla purple, 1.2–1.3 cm, tube 6–7 mm, limb 5.5–6.5 mm, lobes 3–3.5 mm. Achene gray with dark black spots, 3–3.5 mm, glabrous. Pappus dirty white; outer bristles scabrid, 2–4 mm; inner bristles 9–10 mm. Fl. and fr. Sep.

- Montane grasslands; ca. 2700 m. NW Yunnan (Dêqên).


显梗风毛菊 xian geng feng mao ju

*Saussurea peduncularis* var. *cyrtocarpa* Franchet; *S. peduncularis* var. *dendrospora* Franchet; *S. peduncularis* var. *lobata* Franchet.

Herbs 25–90 cm tall, perennial. Stem erect, apically branched, winged, glabrous. Lower stem leaves petiolate; petiole to 4 cm, winged with 1 or 2 pairs of teeth; leaf blade narrowly ovate, elliptic, or ovate, 8–18 × 4–8 cm, lyrate pinnate, abaxially sparsely strigose on veins or glabrous, adaxially green and glabrous, base cuneate-attenuate into winged petiole, margin toothed, apex acute to obtuse. Middle and upper stem leaves sessile, narrowly elliptic, gradually smaller upward on stem, base decurrent on stem, margin dentate. Capitula numerous, in a corymbiform or paniculiform synflorescence, pedunculate. Involucre ovoid to campanulate, 6–12(–15) mm in diam., abaxially usually constricted. Phyllaries in ca. 5 rows, margin sparsely arachnoid; outer phyllaries ovate, ca. 4 × 2 mm, apex acute to obtuse; middle phyllaries elliptic, ca. 7 × 3 mm, apex acute; inner phyllaries narrowly elliptic, ca. 9 × 2 mm, apex obtuse. Corolla dark bluish purple, 1.1–1.3 cm, tube ca. 7 mm, limb ca. 6 mm. Achene brown, cylindrical, ca. 2.5 mm, glabrous. Pappus pale brown; outer bristles ca. 2 mm, scabrid; inner bristles ca. 1 mm. Fl. and fr. Aug–Oct.

- Montane forests, forest margins, thickets, open meadows; 2800–3500 m. NW Yunnan.


狭翼风毛菊 xia yi feng mao ju

Herbs 50–60 cm tall, perennial. Stem solitary, erect, apically branched, narrowly winged, densely pubescent. Basal leaves withered at anthesis. Lower and middle stem leaves shortly petiolate or sessile; petiole winged if present; leaf blade ovate to elliptic, 10–17 × 3–8 cm, undivided or lyrate narrowly lobed, both surfaces green and glabrous, base cuneate-attenuate and decurrent, margin serrulate, apex acute to acuminate; lateral lobes inconspicuous, 1 pair, triangular to elliptic; terminal lobe ovate to elliptic. Upper stem leaves subsessile; leaf blade elliptic to narrowly elliptic, 7–10 × 3–3.5 cm, gradually smaller upward on stem, margin entire. Capitula numerous, in a corymbiform synflorescence, shortly pedunculate. Involucre ovoid-oblong, ca. 5 mm in diam. Phyllaries in ca. 5 rows, abaxially sparsely arachnoid; outer and middle phyllaries ovate to elliptic, 5–6 × 2–3 mm, apex with a 3–4 mm subulate awn; inner phyllaries oblong, 7–10 × 2–3 mm, apex obtuse and mucronate. Corolla purple-red or white, ca. (1–)1.6 cm, tube ca. 9.5 mm, limb ca. 6.5 mm. Achene brown, cylindric, ca. 5 mm, glabrous. Pappus pale brown; outer bristles 2–3 mm, scabrid; inner bristles ca. 9 mm. Fl. and fr. Jul–Sep.–Nov.


棉头风毛菊 mian tou feng mao ju

*Saussurea pallidiceps* Handel-Mazzetti.

Herbs 45–75 cm tall, perennial. Stem erect, apically branched, winged, arachnoid; wing entire. Lower stem leaves shortly petiolate; petiole to 3 cm, base widened, semiamplexicaul, and decurrent; leaf blade ovate, 5–10 × 3–7 cm, lyrate pinnatisect or pinnately lobed, abaxially grayish white and thinly arachnoid, adaxially green and glabrous; lateral segments 1–3 pairs, elliptic, broadly ovate, ovate or suborbicular, 0.3–2 cm; terminal segment broadly ovate, 3.5–8 cm, base shallowly cordate, margin denticulate or subentire, apex acute to obtuse. Middle and upper stem leaves petiolate or sessile, gradually smaller upward on stem; leaf blade lyrate pinnate or undivided; lateral segments 1 pair and elliptic or absent; terminal segment ovate-cordate, 2.5–7 × 2–4.5 cm. Capitula numerous, in a corymbiform or paniculiform synflorescence, pedunculate. Involucre campanulate, 1.1–1.7 cm in diam. Phyllaries in ca. 5 rows, apically densely yellowish brown villous, apex acuminate and mucronate; outer phyllaries ca. 5 × 2–3 mm; middle and inner phyllaries narrowly elliptic to linear, 10–14 × 2–2.5 mm. Corolla purple, ca. 1 cm. Achene glabrous. Pappus brown; outer bristles ca. 4 mm, scabrid; inner bristles ca. 1 cm. Fl. Aug–Sep.

- Montane grasslands; 1900–2900 m. SW Sichuan (Muli), NW Yunnan (Lijiang).

**川西风毛菊 chuan xi feng mao ju**

Herbs 20–90 cm tall, perennial. Stem solitary, erect, apically branched, winged, sparsely lanate or glabrescent; wing sinuate-dentate. Basal and lower stem leaves long petiolate; petiole to 7 cm; leaf blade narrowly ovate-elliptic, 3–12 × 0.4–3 cm, runcinate-pinnately lobed or dentate, abaxially grayish white and arachnoid, adaxially green and sparsely strigose, base decurrent, apex acuminate; middle lobes 3–6 pairs, triangular-ovate, margin dentate. Middle and upper stem leaves sessile, narrowly ovate-elliptic, gradually smaller upward on stem, base decurrent, margin coarsely dentate. Capitula numerous, in corymbose synflorescence, pedunculate. Involucre ovoid, 5–8 mm in diam. Phyllaries in 5 or 6 rows, brown but black near margin, leathery, sericeous, apex acute to obtuse; outer phyllaries ovate, ca. 3 mm; middle phyllaries narrowly ovate-elliptic; inner phyllaries linear. Corolla purple, 1.2–1.4 cm, tube 6–7 mm, limb 6–7 mm, lobes 3.5–4 mm. Achene 2 mm, apex shortly acuminate. Corolla bluish purple, 1.2–1.4 cm, tube 6–7 mm, limb 6–7 mm, lobes 3.5–4 mm. Achene brown, 4–5 mm, glabrous. Pappus yellowish brown; outer bristles scabrid. Fl. and fr. Jul–Oct.

- Alpine steppes and grasslands; 2600–4000 m. Gansu, Qinghai, W Sichuan.


**蓟状风毛菊 ji zhuang feng mao ju**

Herbs 50–60 cm tall, perennial. Stem solitary, erect, apically branched, basally strigose. Basal and lower stem leaves sessile, obovate to elliptic, 8–15 × 4–6 cm, abaxially pale green and sparsely arachnoid or glabrescent on veins, adaxially green and scabrid but glabrescent, base semiamplexicaul and decurrent, margin basally pinnately lobed and apically much branched, sparsely pubescent. Lower stem leaves withered at anthesis. Middle stem leaves petiolate; petiole 5–11 cm; leaf blade ovate to elliptic, 7–15 × 5–9 cm, thin, lyrate pinnately parted or undivided, both surfaces green and glabrous or subglabrous; lateral lobes 1 or 2 pairs, elliptic to triangular; terminal lobe ovate, margin sinuate-dentate, apex acute. Upper stem leaves gradually smaller upward on stem; leaf blade lyrate pinnately parted or undivided; lateral lobes if present 1 pair, ovate-elliptic. Capitula numerous, in a panicleiform or corymbose synflorescence. Involucre narrowly campanulate, 4–9 mm in diam. Phyllaries in 5 or 6 rows, arachnoid; outer phyllaries ovate, apex recurved; inner phyllaries narrowly ovate-elliptic, apex acute to subacute. Corolla white, 8–11 mm. Achene pale brown, ca. 5 mm, glabrous. Pappus white; outer bristles ca. 3 mm, scabrid; inner bristles ca. 1 cm. Fl. and fr. Aug–Sep.

- Montane forests; 1300–1800 m. Gansu, S Shaanxi (Qin Ling).


**桑叶风毛菊 sang ye feng mao ju**

Herbs 20–60 cm tall, perennial. Stem solitary, erect, simple or few branched, glabrous. Basal and lower stem leaves petiolate; petiole 8–11 cm; leaf blade obovate to elliptic, 7–11 × 3.5–6 cm, lyrate pinnatisect, both surfaces green and glabrous; lateral segments 2–4 pairs, elliptic to narrowly triangular, margin denticulate or subentire, apex obtuse to acute; terminal segment ovate to triangular-ovate, margin sparsely denticulate, apex acute to acuminate. Middle stem leaves shortly petiolate; leaf blade elliptic; lateral segments 1 or 2 pairs, elliptic; terminal segment triangular-hastate. Upper stem leaves small, with 1 pair of lobes or undivided; terminal lobe or leaf blade narrowly elliptic to broadly linear. Capitula solitary and terminal on stem or 2–4 in a corymbose synflorescence, pedunculate. Involucre campanulate, 7–12 mm in diam. Phyllaries in 4–6 rows, subglabrous, apically reflexed; outer phyllaries ovate, ca. 5 × 3 mm; middle phyllaries elliptic, 6–8 × 1.5–2 mm, apex long acuminate; inner phyllaries linear, 9–10 × ca. 1 mm, apex acute. Corolla purple, ca. 1.5 cm, tube ca. 9 mm, limb ca. 6 mm, lobes ca. 4 mm. Achene brown, 4–5 mm, glabrous. Pappus dirty white; outer bristles ca. 2 mm, scabrid; inner bristles ca. 1 cm. Fl. and fr. Jul–Sep.

- Montane forests, trailsides; 1800–2700 m. SE Gansu, S Shaanxi (Qin Ling).


**鹤庆风毛菊 he qing feng mao ju**

Herbs 25–40 cm tall, perennial. Stems erect, simple or apically branched, narrowly winged, many leaved. Basal and lower stem leaves petiolate; petiole broadly winged, margin dentate; leaf blade ovate to elliptic, 7–10 × 3–4 cm, lyrate pinnatisect, abaxially whitish and densely tomentose, adaxially green and scabrid; lateral lobes 2 or 3 pairs, ovate to triangular, base truncate or shallowly cordate, margin entire or dentate; terminal lobe ovate-triangular, apex acute to shortly acuminate. Upper stem leaves gradually smaller upward on stem. Capitula
numerous, in 3–5 corymbiform synflorescences at end of axillary branches, sub sessile. Involute narrowly campanulate, 5–7 mm in diam. Phyllaries in 5 or 6 rows, straw-colored, subglabrous, apex long acuminate and patent or reflexed; outer phyllaries ovate, 2–3 × 1–1.5 mm; middle phyllaries narrowly ovate-elliptic, 3–6 × ca. 1.5 mm; inner phyllaries linear, 6–8 × ca. 1 mm. Corolla and achene unknown. Pappus pale white; outer bristles scabrid; inner bristles ca. 7 mm. Fl. and fr. Jun–Sep.

- Forests, thickets. Yunnan (Heqing).

Saussurea lampisantha is apparently only known from the single type specimen with not yet developed florets.


长毛风毛菊 chang mao feng mao ju

Saussurea leveilleana Maire; S. villosa Franchet.

Herbs 5–20(–35) cm tall, perennial. Stem solitary, well developed, erect, simple, densely white villous. Basal leaves distinctly petiolate; petiole to 8 cm; leaf blade elliptic to narrowly elliptic-oblancoellate, 2–16 × 0.8–4 cm, abaxially pale green and sparsely villous, adaxially dark green and sparsely villous, base oblique and rounded to cuneate, margin entire and ciliate, apex acute to obtuse. Stem leaves few, sessile, narrowly ovate-elliptic to linear, gradually smaller upward on stem. Capitulum solitary, terminal on stem. Involute campanulate, 1–1.5 cm in diam. Phyllaries in 4 or 5 rows, blackish purple, subglabrous, apex long acuminate; outer phyllaries narrowly ovate-triangular, ca. 10 × 3 mm; middle phyllaries narrowly ovate-elliptic, ca. 13 × 2.5 mm; inner phyllaries narrowly lanceolate to linear, ca. 2 × 0.2 cm. Corolla purple, 1.8–2.4 cm, tube 1–1.6 cm, limb ca. 8 mm, lobes 5–6 mm. Achene brown, cylindric, 2–4 mm, glabrous. Pappus pale brown; outer bristles 2–7 mm, scabrid; inner bristles ca. 1.4 cm. Fl. and fr. Jun–Sep. 2n = 64.

Alpine scree slopes, grasslands, rocky slopes; 4400–5200 m. W Sichuan, Xizang, NW Yunnan [Bhutan, India (Sikkim), Nepal].


横断山风毛菊 heng duan shan feng mao ju

Saussurea superba f. pygmaea J. Anthony; S. tatsienensis Franchet var. monocephala Diels.

Herbs 3–25(–35) cm tall, perennial, stemless or cauliforous. Stem solitary, erect, simple, densely villous. Rosette leaves sessile or shortly petiolate; petiole winged if present; leaf blade elliptic to narrowly obovate-elliptic, 3–10 × 1–3.5 mm, both surfaces green and subgla brous, base attenuate, margin entire or inconspicuously denticulate, apex obtuse to subacute. Stem leaves sessile, narrowly elliptic to linear, smaller. Capitulum solitary, sessile in center of leaf rosette or terminal on stem. Involute broadly campanulate, 1.5–4 cm in diam. Phyllaries in 4 or 5 rows, blackish purple, subgla brous, apex long acuminate; outer phyllaries narrowly ovate-triangular, 10–15 × 3–5 mm; middle phyllaries narrowly ovate-elliptic, 12–18 × 2–3 mm; inner phyllaries narrowly ovate-elliptic to linear, 15–25 × 1–2 mm. Corolla bluish purple, 1.8–2.6 cm, tube 1–1.8 cm, limb 8–11 mm, lobes 5–6 mm. Achene brown, cylindric, 3–4 mm, glabrous. Pappus pale brown; outer bristles 2–5 mm, scabrid; inner bristles 1.3–2 cm. Fl. and fr. Jun–Sep.

- Alpine grasslands, rocky slopes; 2800–5200 m. Gansu, Qinghai, W Sichuan, Xizang, NW Yunnan (Déqên, Zhongdian).


打箭风毛菊 da jian feng mao ju

Herbs 10–60 cm tall, perennial. Stem solitary, erect, simple or apically few branched, villous. Lower stem leaves petiolate; petiole to 7 cm; leaf blade narrowly ovate-elliptic to narrowly elliptic, 4–15(–20) × 1–3(–5) mm, both surfaces green and pubescent, base attenuate, margin entire or denticulate and ciliate, apex acute to acuminate. Middle stem leaves sessile, gradually smaller upward on stem, base semiamplexicaul. Uppermost stem leaves linear-subulate, subtending synflorescence. Capitula 2–8, in a corymbiform synflorescence or sometimes solitary, pedunculate. Involute campanulate to obconic, 1–2 cm in diam. Phyllaries in 4 or 5 rows, blackish purple, glabrous or sparsely villous, apex acuminate; outer phyllaries narrowly triangular-ovate, 8–10 × 2–3 mm; middle phyllaries narrowly ovate-elliptic, 10–12 × 1.5–2 mm; inner phyllaries linear, 12–15 × 1–1.5 mm. Corolla bluish purple, 1.2–1.4 cm, tube 6–8 mm, limb 5–6 mm, lobes 3–3.5 mm. Achene glabrous. Pappus dirty white; outer bristles 2–3.5 mm, scabrid; inner bristles 9–10 mm. Fl. Jul.–Sep.

- Alpine meadows, montane grasslands; 3000–4600 m. Qinghai, W Sichuan, NW Yunnan.

In Qinghai, several specimens have been found that are morphologically intermediate between Saussurea nigrescens and S. tatsienensis. Both species are very common in the high montane grasslands in the NE part of the Qinghai-Xizang Plateau and probably hybridize where they occur together.


尖苞风毛菊 jian bao feng mao ju

Herbs 5–45 cm tall, perennial. Stems solitary or several, erect, simple or apically few branched, sparsely villous. Basal and lower stem leaves petiolate; petiole to 12 cm; leaf blade narrowly elliptic, 2–13 × 0.5–1.5(–2) cm, both surfaces green and sparsely villous, base attenuate, margin denticulate and ciliate, apex acute to acuminate. Middle stem leaves sessile, narrowly elliptic to linear, smaller, base semiamplexicaul. Upper stem leaves linear. Capitula 2 or 3(–6), in corymbiform synflorescence or sometimes solitary, pedunculate. Involute obconic, 1–1.5 cm in diam. Phyllaries in 4 or 5 rows, blackish purple, glabrous or subglabrous, apex acute to acuminate; outer phyllaries narrowly ovate-elliptic, 10–13 × 2–3 mm; middle phyllaries narrowly triangular, 13–17 × 2–2.5 mm; inner phyllaries narrowly elliptic to linear, 17–20 × 1–2 mm. Receptacle bristles 5–7 mm. Corolla blackish to bluish purple, 1.4–1.5 cm, tube 6–7 mm, limb 7–8 mm, lobes 3.5–4 mm. Achene brown or gray with black spots, ellipsoid, 3–3.5 mm, glabrous. Pappus apically white, basally straw-colored to pale brown; outer bris-

- Alpine meadows, montane grasslands; 3400–4900 m. Gansu, Qinghai, W Sichuan, Xizang, NW Yunnan.

Saussurea acutisquama is a taxon that has been recognized as S. polycolea var. acutisquama (e.g., Lipschitz, Rod Saussurea. 64. 1979; S. W. Liu, Fl. Qinghai. 3: 451. 1996) or as S. nigrescens var. acutisquama (e.g., S. Y. Liang, Fl. Xizang. 4: 871. 1985). Both names are based on a type that represents an entirely different taxon, S. erubescens. Saussurea acutisquama is widespread in the grasslands of the NE part of the Qinghai-Xizang Plateau and is a good species, quite different from both S. polycolea and S. nigrescens.


Saussurea euodonta is widespread in the grasslands of the NE part of the Qinghai-Xizang Plateau and is a good species, quite different from both S. polycolea and S. nigrescens.


Herbs from both part of the Qinghai-Xizang Plateau and is a good species, quite different
Herbs 30–60 cm tall, perennial. Stem solitary, erect, apically branched, narrowly winged, subglabrous. Basal leaves petiolate; leaf blade narrowly ovate-elliptic to oblong, both surfaces green and glabrous, usually withered at anthesis. Lower and middle stem leaves petiolate; petiolo winged; leaf blade narrowly elliptic to linear, 10–18 × 2–2.5 cm, base attenuate, margin revolute and entire or denticulate, apex long acuminate. Upper stem leaves sessile, smaller ones linear. Capitula numerous, in a clustered hemispheric-corymbiform synflorescence at end of stem and branches, shortly pedunculate or sessile. Involute narrowly campanulate, 5–6 mm in diam. Phyllaries in ca. 4 rows, sparsely pubescent; outer phyllaries ovate, apex long acuminate to caudate and usually reflexed; middle phyllaries oblong, apex acute; inner phyllaries linear, apex acute. Corolla pink, 7–9 mm. Achene unknown by authors. Pappus dirty white; outer bristles ca. 8 mm.

● Alpine rocky areas or scree slopes; 2900–3500 m. Taiwan.

The misspelling “Saussurea kirasienensis,” established by Kitamura, has been widely used in the literature, including in Fl. Taiwan, ed. 2 (4: 1051. 1998).


Herbs 25–60 cm tall, perennial. Stems solitary or few, erect, simple, subglabrous. Basal leaves withered at anthesis. Lower and middle stem leaves sessile, narrowly elliptic to linear, 7–12 × 0.9–2 cm, abaxially grayish green, usually gland-dotted, densely to sparsely tomentose or glabrescent, adaxially green and subglabrous, base auriculate and semiamplexicaul, margin denticulate, apex long acuminate. Upper stem leaves gradually smaller upward on stem, base cuneate. Capitula numerous, in a clustered corymbiform synflorescence, shortly pedunculate. Involute narrowly campanulate, 6–8 mm in diam. Phyllaries in 4 or 5 rows, apically usually arachnoid; outer phyllaries ovate-triangular, 9–13 × 1.5–3 mm, apical part blackish green, saberr-shaped, 5–9 mm, and reflexed, apex acuminate; middle phyllaries narrowly ovate-elliptic, 7–9 × 2–3 mm, apical part blackish purple and 1–4 mm; inner phyllaries linear, 8–10 × 1–1.5 mm, apex acute to subobtuse. Corolla purple, 8–10 mm, tube 4–5 mm, limb 4–5 mm, lobes 3–3.5 mm. Achene cylindrical, 3–4 mm, glabrous. Pappus dirty white; outer bristles 1.5–3.5 mm, scabrid; inner bristles 7–8 mm. Fl. and fr. Jul–Sep.

● Mountain slopes, alpine meadows; 2600–4200 m. Gansu, Ningxia, Qinghai, W Sichuan.


Herbs 50–100 cm tall, perennial. Stem solitary, erect, apically branched, narrowly winged, pubescent. Basal leaves petiolate; petiolo narrowly winged; leaf blade elliptic to narrowly ovate-elliptic, 10–25 × 2–4–(6) cm, abaxially grayish green, gland-dotted, and sparsely arachnoid, adaxially green and sparsely brown pubescent, base truncate to rounded, margin dentate, apex acute. Lower and middle stem leaves sessile, narrowly elliptic to narrowly oblong, 9–18 × 1–3 cm, base cuneate, margin dentate, apex acute to acuminate. Upper stem leaves narrowly elliptic to linear, margin entire. Capitula several, in a paniculiform or corymbiform synflorescence. Involute campanulate, ca. 1 cm in diam. Phyllaries in ca. 5 rows, gland-dotted and puberulent; outer and middle phyllaries ovate, apical
part saber-shaped and reflexed, apex acuminate-caudate; inner phyllaries narrowly elliptic to linear, apex acuminate. Corolla pale purple, 1.2–1.5 cm, tube 6–8 mm, limb 6–7 mm. Achene cylindric, 3–4 mm. Pappus pale brown; outer bristles 2–3 mm, scabrid; inner bristles ca. 1 cm. Fl. and fr. Jul.–Aug.

Forests, forest meadows. Heilongjiang, Jilin, Nei Mongol [Korea, Russia (Far East, E Siberia)].


湖风毛菊 hui bei feng mao ju


Herbs 30–60(–75) cm tall, perennial. Stem solitary, erect, apically branched, narrowly winged, sparsely arachnoid and glandular hairy. Lower and middle stem leaves petiolate; petiole 0.5–5.5 cm, winged, base decurrent; leaf blade ovate, oblance, or narrowly ovate-elliptic, 5–10(–15) × 2–3.5 cm, abaxially green, gland-dotted, and sparsely pubescent, adaxially dark green and glabrescent, base cuneate and abruptly narrowed into petiole, margin crenate to dentate, apex acuminate to caudate. Upper stem leaves shortly petiolate or sessile, gradually smaller upward on stem; leaf blade narrowly ovate-elliptic, base decurrent. Capitula numerous, to 3–5 in a clustered corymbose synflorescence at end of branches, shortly pedunculate. Involucre narrowly campanulate, 5–7(–10) mm in diam. Phyllaries in 5 or 6 rows, basally yellowish green, apically sometimes purplish, glabrous or arachnoid, apex obtuse; outer phyllaries ovate, 1.5–2 × 1–1.5 mm; middle phyllaries narrowly ovate, 2–6 × 1.5–2 mm; inner phyllaries linear, 7–8(–10) × 0.8–1.5 mm. Receptacle bristles subulate, 4–5 mm. Corolla purple, 8–9(–12) mm, tube 4–5 mm, limb 4–4.5 mm, lobes 2.5–3 mm. Achene cylindric, 3–4 mm, glabrous. Pappus dirty white; outer bristles 1–3 mm, scabrid; inner bristles 6–9 mm. Fl. and fr. Jul.–Sep.


*S. hemsleyi* was mistakenly treated by Handel-Mazzetti as *S. parviflora* var. atriplicifolia (Acta Horti Gothob. 12: 317. 1938).


小花风毛菊 xiao hua feng mao ju

*Serratula parviflora* Poiret in Lamark, Encycl. 6: 554. 1805; *Saussurea atriplicifolia* Fischer ex Herder; *S. chowana* F. H. Chen; *S. parviflora* var. atriplicifolia (Fischer ex Herder) Handel-Mazzetti; *S. parviflora* var. cinerascens Handel-Mazzetti; *S. parviflora* var. cuspidata Handel-Mazzetti.

Herbs 30–110 cm tall, perennial. Stem solitary, erect, apically branched, narrowly winged, sparsely pubescent or glabrous. Basal leaves withered at anthesis. Lower stem leaves petiolate to subsessile; petiole 5–10(–20) mm, narrowly winged, base decurrent; leaf blade elliptic or narrowly ovate, 7–18(–30) × 1.5–4.5 cm, abaxially grayish green or glaucous, usually gland-dotted, and glabrous or puberulent, adaxially green and scabrid but glabrescent, base attenuate, margin dentate to denticate, apex acuminate. Middle and upper stem leaves sessile, narrowly ovate-elliptic to narrowly elliptic, 4–15 × 1–3.5 cm, gradually smaller upward on stem. Capitula numerous, in a corymbose synflorescence, shortly pedunculate. Involucres narrowly campanulate, 5–8 mm in diam. Phyllaries in 4 or 5 rows, yellowish green, apically or entirely dark purple, glabrous or sparsely pubescent, apex subacute to obtuse; outer phyllaries ovate, 2–3 × 1.5–2 mm; middle phyllaries narrowly ovate-elliptic, 3–7 × 2–2.5 mm; inner phyllaries narrowly elliptic, 9–10 × 0.8–1.5 mm. Receptacle bristles subulate, 5–6 mm. Corolla purple, 1.1–1.3 cm, tube 5–7 mm, limb 5–6 mm, lobes 2.5–4 mm. Achene cylindric, 3–4 mm. Pappus dirty white; outer bristles 2–4 mm, scabrid; inner bristles (6–)8–9 mm. Fl. and fr. Jul.–Aug.


宽翅风毛菊 kuan chi feng mao ju

*Aplotaxis candolleana* Candolle, Prodr. 6: 541. 1838; *Saussurea candolleana* var. glabrata Lipschitz; *S. candolleana* subsp. platyptera Lipschitz; *S. pterocaulon* Decaisne.

Herbs 50–100 cm tall, perennial. Stem solitary, erect, apically branched, narrowly winged. Lower stem leaves sessile, ovate-elliptic, obovate, or narrowly elliptic-oblong, 12–18 × 4–6 cm, abaxially pale green, gland-dotted, and sparsely arachnoid, adaxially dark green, scabrid, and sparsely pubescent to subglabrous, base attenuate, semiamplexicalyxid, and decurrent, margin denticulate, apex acuminate. Middle and upper stem leaves 6–16 × 0.8–4 cm, gradually smaller upward on stem. Capitula 10–20, in a clustered corymbose synflorescence. Involucres narrowly campanulate, 5–8 mm in diam. Phyllaries in 5 or 6 rows, yellowish green but dark purple apically; outer phyllaries ovate, 3–6 × 1–2.5 mm, apex acuminate; middle phyllaries narrowly ovate-elliptic, 5–8 × 1.5–2 mm, apex acuminate to subacute; inner phyllaries narrowly elliptic to linear, 8–10 × 1–1.5 mm, apex obtuse. Receptacle bristles light brown, 5–8 mm. Corolla 1.1–1.2 cm, tube 5–6 mm, limb 5–6 mm, lobes 3.5–4 mm. Achene obconic to cylindric, ca. 5 mm, glabrous. Pappus light brown; outer bristles 2–4 mm; inner bristles 8–9 mm. Fl. and fr. Aug.–Sep. 2n = 26.

Tall forb communities on scree slopes, *Juniperus* woodlands; 2800–3900 m. S Xinjiang (Tingri, Yadong) [?Bhutan, NE and NW India, Kashmir, Nepal].

The report of *S. parviflora* from S Xinjiang (S. Y. Liang, Fl. Xinjiang 4: 893. 1985) is in fact referable to *S. candolleana*, which has recently also been found in a second locality in S Xinjiang, in Tingri Xian.


宽叶风毛菊 kuan ye feng mao ju

Herbs 35–100 cm tall, perennial. Stem solitary, erect, apically few branched, winged, densely leafy. Basal and lower stem leaves petiolate; leaf blade ovate to elliptic, 6–15 × 4–9 cm, subglabrous, base cuneate and abruptly narrowed into petiole, petiole 5–20 mm, narrowly winged, apex acuminate.
cm, both surfaces green, abaxially pubescent or glabrous, adaxially scabrid, base ± cordate, margin serrate and ciliate, apex acuminate. Middle and upper stem leaves shortly petiolate or sessile, gradually smaller upward on stem, base decurrent. Uppermost stem leaves narrowly ovate-elliptic to narrowly elliptic. Capitula numerous, in a clustered corymbiform synflorescence. Involucre campanulate, 5–6(–8) mm in diam. Phyllaries in 4 or 5 rows, often dark violet, pubescent; outer phyllaries ovate, apex obtuse to subacute; middle and inner phyllaries oblong to narrowly ovate-elliptic, apex subobtuse to acuminate. Receptacle sparsely bristly. Corolla purplish violet, 1–1.1 cm, tube 5–6 mm, lobes ca. 3.5 mm. Achene pale brown, cylindric, ca. 3.5 mm. Pappus dirty white; outer bristles 3–4 mm, scabrid; inner bristles 8–10 mm. Fl. and fr. Jul–Aug. $2n = 24, 26$.

Forests, subalpine and alpine meadows; below 2500 m. N Xinjiang (Altay Shan) [SE Kazakhstan, Mongolia, Russia (Siberia)].


狭头风毛菊  
Saussurea microcephala Diels, Bot. Jahrb. Syst. 29: 624. 1901, not Franchet (1888); S. stenocephala Y. Ling.

Herbs 50–80 cm tall, perennial. Stems solitary or several, erect, simple or apically branched, wingless. Lower stem leaves petiolate; petiole 3–6 cm; leaf blade oblong-triangular to ovate, 8–10 \times 4–5(–8) mm, undivided or pinnately lobed, both surfaces green, scabridulous, and subglabrous, base truncate to rarely cordate, margin sinuate-dentate, apex acuminate; lateral lobes 2 or 3 pairs. Upper stem leaves petiolate; petiole 0.5–4 cm; leaf blade narrowly ovate-elliptic to narrowly triangular, gradually smaller upward on stem, usually undivided, base cuneate-truncate, or slightly rounded, apex long acuminate. Capitula numerous, in a corymbiform synflorescence or solitary at leaf axils, pedunculate. Involucre narrowly campanulate to cylindrical, 4–6 mm in diam. Phyllaries in 5 or 6 rows, leathery, apically purple, arachnoid at margin; outer phyllaries ovate, small, apex acute and patent to recurved; inner phyllaries linear, apex acute to slightly obtuse. Corolla purplish red, ca. 1.1 cm. Achene brown, cylindric, ca. 5 mm. Pappus white; outer bristles ca. 2 mm, scabrid; inner bristles ca. 9 mm. Fl. and fr. Oct. $2n = 26^*$.  

● Montane grasslands; 800–1800 m. Nei Mongol [Korea, Mongolia, Russia (Siberia)].


齿叶风毛菊

Saussurea serrata Candolle var. amurensis Herder; S. parviflora (Poir.) Candolle var. amurensis (Herder) S. Y. Hu.

Herbs 30–100 cm tall, perennial. Stem solitary, erect, apically branched, narrowly winged, glabrescent. Basal leaves withered at anthesis. Lower and middle stem leaves petiolate; petiole 3–10 cm, winged; leaf blade ovate-elliptic to elliptic, 10–21 \times 3–6(–8.5) cm, abaxially glaucous and subglabrous, adaxially green and glabrous, base attenuate, margin dentate to serrate, apex long acuminate. Upper stem leaves narrowly elliptic to linear, gradually smaller upward on stem. Capitula numerous, in a corymbiform synflorescence, shortly pedunculate. Involucre narrowly campanulate-obconic, 3–6 mm in diam. Phyllaries in 4–6 rows, yellowish green but blackish purple apically and near margin, conspicuously 3-veined, subglabrous, apex obtuse; outer phyllaries ovate, 1.5–2.5 \times 1–1.5 mm; middle phyllaries narrowly ovate, 2–8 \times 1.5–1.8 mm; inner phyllaries linear, 8–10 \times 1–1.5 mm. Receptacle bristles subulate, 3–4 mm. Corolla purple, 9–10 mm, tube 5–6 mm, limb 4–5 mm, lobes 3–4 mm. Achene brown, cylindric, 3–(4–)6 mm. Pappus dirty white; outer bristles 1.5–3 mm, scabrid; inner bristles 6–8 mm. Fl. and fr. Jul–Aug. $2n = 26, 52$.

Larix forest margins, forest meadows. Heilongjiang, Jilin, Nei Mongol [Korea, Mongolia, Russia (Far East, E Siberia)].


浅堇色风毛菊

Herbs 40–65 cm tall, perennial. Stem solitary, erect, simple, unwinged, arachnoid. Basal leaves petiolate; petiole 1–3 cm; leaf blade ovate to elliptic, 3–10 \times 1.5–5 cm, abaxially grayish white or grayish green and densely tomentose, adaxially green and strigose, base rounded to cuneate, margin denticulate, apex obtuse to acute and mucronate. Lower stem leaves petiolate; leaf blade narrowly elliptic to elliptic, base cuneate-attenuate. Middle and upper stem leaves shortly petiolate or sessile, gradually smaller upward on stem; leaf blade narrowly elliptic to linear. Capitula 3–6, clustered in a corymbiform synflorescence, shortly pedunculate. Involucre narrowly campanulate, 5–7 mm in diam. Phyllaries in 4–6 rows, straw-colored or pale green, tomentose, apex subobtuse and mucronate; outer phyllaries ovate, 3 \times 2–3 mm; middle phyllaries narrowly elliptic, ca. 7 \times 3 mm; inner phyllaries linear, ca. 10 \times 1 mm. Corolla white, ca. 1 cm. Pappus pale brown; outer bristles ca. 2 mm, scabrid; inner bristles 8–10 mm. Fl. and fr. Oct.

● Montane forests, thickets; 2000–2300 m. NW Yunnan (Dali, Yongsheng).


西康风毛菊

Herbs 30–40 cm tall, perennial. Stem solitary, erect, simple or apically few branched, narrowly winged. Basal leaves petiolate; petiole 4–6 cm, narrowly winged; leaf blade ovate to elliptic, 6–10 \times 3–5 cm, abaxially white, densely tomentose, and with brown hairs on veins, adaxially green, scabridulous, and densely strigose, base cuneate-attenuate and decurrent, margin shallowly crenate, denticulate, or subentire, apex obtuse and mucronate. Lower stem leaves petiolate; petiole 1–1.5 cm, winged, base widened, semiamplexicaul, and decurrent on stem; leaf blade ovate, 4.5–6 \times 1.8–2.5 cm. Middle and upper stem leaves petiolate or sessile, gradually smaller upward on stem; leaf blade narrowly elliptic to linear. Capitula 2–4, in a racemiform or corymbiform synflorescence or sometimes solitary, long pedunculate. Involucre ovoid, (5–)8–10 mm in diam. Phyllaries in 5 or 6 rows, straw-colored but apically purple, sparsely arachnoid, apex obtuse and mucronate; outer phyllaries
ovate, 3–4 × 1–2 mm; middle phyllaries narrowly ovate-elliptic, 4–10 × 2–2.5 mm; inner phyllaries linear, 12–13 × 1–1.5 mm. Receptacle bristles subulate-filiform, 7–9 mm. Corolla purple, 1.4–1.5 cm, tube 7–8 mm, limb 7–7.5 mm, lobes 3.5–4 mm. Pappus dirty white; outer bristles 1.5–2 mm, scabrid; inner bristles 8–10 mm. Fl. and fr. Aug–Oct.

- Montane grasslands; 3000–3500 m. W Sichuan (Kangding).


牛耳风毛菊 *niu er feng mao ju*

*Saussurea nobilis* Franchet; *S. woodiana* f. caulescens Lipschitz; *S. woodiana* f. subcaulis Lipschitz.

Herbs 3–8(–25) cm tall, perennial, stemless or caulescent. Stem solitary, erect, simple. Rosette leaves sub sessile or petiolate; petiole winged; leaf blade elliptic to ovate, 5–20 × 1.5–7 cm, abaxially greyish green or brownish and densely tomentose, adaxially green and glandular hairy, base attenuate, margin subentire, apex obtuse to subacute. Stem leaves 1–3, similar to basal leaves. Petiole subulate-filiform, 7–9 mm. Corolla purple, 1.2–1.5 cm, tube ca. 6 mm, limb 6–7.5 mm, lobes 3.5–4 mm. Achene blackish brown, cylindric, ca. 4 mm. Pappus dirty white; outer bristles scabrid; inner bristles 6–7 mm. Fl. and fr. Aug–Oct.

- Montane grasslands, rocky slopes; 2000–2300 m. Guizhou (Fanjing Shan, Jiangkou, Qingshan).


圆叶风毛菊 *yuan ye feng mao ju*

*Saussurea rotundifolia* H. Ling.

Herbs 10–30 cm tall, perennial. Stem solitary, erect, simple, apically very narrowly winged or wingless, sparsely arachnoid. Basal leaves withered at anthesis. Middle stem leaves petiolate; petiole 1–1.5 cm, narrowly winged, base elongated and amplexicaul; leaf blade broadly ovate to orbicular or triangular, 0.5–5.5 × 0.5–4 cm, abaxially arachnoid and glandular hairy, axially dark green and subglabrous, base truncate to cuneate and decurrent, margin serrulate, apex acute. Upper stem leaves sub sessile, slightly smaller. Capsule 1–3, pedunculate. Involucre ovoid-campanulate, ca. 1.3 cm in diam. Phyllaries in ca. 4 rows, pubescent; outer phyllaries narrowly ovate to triangular, apex acuminate; middle phyllaries narrowly ovate-elliptic, apex acute to obtuse; inner phyllaries narrowly elliptic to linear, apex acuminate. Corolla purple, 9–10 mm. Achene cylindrical, ca. 4 mm. Pappus dirty white; outer bristles scabrid. Fl. and fr. Aug–Sep.

- Trailsides on mountain slopes; 3100–3300 m. S Shaanxi (Qinling), Sichuan.


阿拉善风毛菊 *ala shan feng mao ju*

Herbs 10–30 cm tall, perennial. Stem solitary, erect, simple, sparsely arachnoid. Basal and lower stem leaves petiolate; petiole 1–5 cm; leaf blade elliptic to ovate-elliptic, 2.5–13 × 1.5–5 cm, abaxially greyish green and densely tomentose, adaxially green and glabrous, base truncate to rounded, margin dentilicate to sinuate-dentate, apex acuminate. Middle stem leaves few, shortly petiolate, gradually smaller upward on stem. Upper stem leaves sessile, narrowly ovate-elliptic to narrowly elliptic. Corolla 0.6 cm; middle phyllaries narrowly ovate-elliptic, 1.9–2.3 × 0.4–0.6 cm; inner phyllaries narrowly elliptic, 2.8–3 × 0.2–0.3 cm. Corolla purple, 2.8–3 cm, tube (1.4–1)–1.8–2.2 cm, limb 1–1.2 cm, lobes 6–8 mm. Achene cylindrical, ca. 4 mm. Pappus pale brown; outer bristles ca. 3 mm, scabrid; inner bristles ca. 2.2 cm. Fl. and fr. Jul–Sep.

- Montane grasslands; 3000–4200 m. Qinghai, Sichuan.


蓼叶风毛菊 *liao ye feng mao ju*

Herbs ca. 70 cm tall, perennial. Stem solitary, erect, semiamplexicaul and decurrent; leaf blade broadly ovate, suborbicular or orbicular, 3–6 × 2.5–5 cm, abaxially arachnoid tomentose, adaxially dark green and subglabrous, base truncate to rounded, margin serrulate, apex acute. Middle stem leaves shortly petiolate to subsessile, margin crenate-dentate, apex acuminate. Petiole winged; leaf blade narrowly ovate-elliptic to narrowly elliptic. Corolla 1.5–5 cm, abaxially green and glandular hairy, base truncate to cuneate and decurrent, margin serrulate, apex acute. Upper stem leaves sub sessile, slightly smaller. Capsule 1–3, pedunculate. Involucre ovoid-campanulate, ca. 1.3 cm in diam. Phyllaries in ca. 4 rows, pubescent; outer phyllaries narrowly ovate to triangular, apex acuminate; middle phyllaries narrowly ovate-elliptic, apex acute to obtuse; inner phyllaries narrowly elliptic to linear, apex acuminate. Corolla purple, 6–7 × 1–1.5 mm, apex obtuse. Achene blackish brown, cylindrical, ca. 4 mm. Pappus dirty white; outer bristles 2–3 mm, scabrid; inner bristles ca. 1.2 cm. Fl. and fr. Jul–Sep.

- Thickets, mountain slopes, rock fissures. Nei Mongol, Ningxia [Mongolia].
cally few branched, narrowly winged, sparsely arachnoid or glabrous. Basal and lower stem leaves withered at anthesis, long petiolate. Middle stem leaves sessile, narrowly ovate-elliptic to narrowly elliptic, 5–8 × 1–2 cm, abaxially grayish green or white and densely tomentose, adaxially light green and scabrid, base decurrent, margin subentire or denticulate, apex acuminate. Upper stem leaves sessile, narrowly elliptic to linear, gradually smaller upward on stem. Capitula 4–10, in a lax racemiform synflorescence, long pedunculate. Involucre narrowly campanulate, (5–)7–9 mm in diam. Phyllaries in 4 or 5 rows, straw-colored to reddish brown, glabrous or sparsely villous, apex acuminate; outer phyllaries triangular-ovate, ca. 3 × 2 mm; middle phyllaries narrowly ovate-elliptic, 3–5 × 1–2 mm; inner phyllaries narrowly elliptic, ca. 5 × 1 mm. Corolla white, ca. 1.2 cm. Achene ca. 2 mm. Pappus straw-colored; outer bristles scabrid. Fl. Sep.

- Montane thickets; 2900–3300 m. Sichuan (Yanyuan).


**Saussurea rosthornii** Diels var. sesstitifolia Diels.

Herbs 50–60 cm tall, perennial. Stem solitary, erect, simple, narrowly winged or wingless. Basal and lower stem leaves withered at anthesis. Middle stem leaves petiolate; petiole winged; leaf blade ovate to elliptic, 7–11 × 3.5–6 cm, abaxially grayish white and densely tomentose, adaxially green and slightly scabrid, base cuneate-attenuate to truncate, margin denticulate, apex acute. Capitula 4–10, in a clustered corymbose synflorescence, shortly pedunculate or sessile. Involucre ovoid, ca. 6 mm in diam. Phyllaries in 4 or 5 rows, brownish, pubescent or arachnoid; outer phyllaries ovate, apex with black mucro; middle phyllaries narrowly ovate-elliptic; inner phyllaries linear. Corolla red, 9–10 mm. Achene ca. 3 mm, glabrous. Pappus pale brown; outer bristles scabrid. Fl. and fr. Sep–Oct.

- Open forests; 1700–3000 m. Chongqing (Nanchuan), Henan, S Shaanxi (Qin Ling).

280. Saussurea amurensis Turczaninow ex Candolle, Prodr. 6: 534. 1838.

**Saussurea amurensis** subsp. *stenophylla* (Freyn) Kitamura; *S. stenophylla* Freyn.

Herbs 40–100 cm tall, perennial. Stem solitary, erect, apically branched, narrowly winged, arachnoid or glabrous. Basal leaves long petiolate; leaf blade ovate-elliptic to narrowly ovate-elliptic, 10–30 × 2–5 cm, abaxially grayish white or grayish green and densely arachnoid tomentose, adaxially green and glabrous, base cuneate-attenuate, margin denticulate, apex acuminate. Lower and middle stem leaves shortly petiolate or sessile; leaf blade narrowly elliptic to linear, base cuneate-attenuate and denticulate, margin denticulate, apex acuminate. Upper stem leaves sessile, linear, gradually smaller upward on stem, margin entire. Capitula numerous, in a corymbose synflorescence, shortly pedunculate. Involucre narrowly campanulate, 6–8 mm in diam. Phyllaries in 4 or 5 rows, villous; outer phyllaries purple, ovate, ca. 3 × 2 mm, apex acuminate to subobtuse; inner phyllaries lanceolate to oblanceolate, ca. 10 × 1.5 mm, apex subobtuse. Corolla pale purple, 1–1.2 cm, tube 5–6 mm, limb 5–7 mm. Achene brown, cylindrical, 3–4 mm, glabrous. Pappus dirty white; outer bristles ca. 1 mm, scabrid; inner bristles 8–10 mm. Fl. and fr. Jul–Sep. 2n = 26, 48, 52, 54.

Marshy meadows, meadows, forest margins; 900–1300 m. Heilongjiang, Jilin, Liaoning, Nei Mongol [Korea, Russia (Far East, E Siberia)].


**Saussurea chi jing feng mai ju**

**Saussurea po se ye feng mai ju**
Herbs 5–16 cm tall, perennial, stemless or shortly stemmed. Stem solitary, purple, erect, apically few branched, densely covered with brown articulate hairs. Leaves usually in basal rosette. Rosette and lower stem leaves petiolate; petiole 1–3 cm, densely covered with brown articulate hairs; leaf blade broadly ovate or elliptic to suborbicular, 4–7 × 2–5 cm, abaxially white, densely tomentose, and with brown hairs on veins, adaxially green and with hairs on veins, base round, truncate, or slightly cordate, margin dentate, apex rounded. Middle stem leaves sessile, smaller. Capitula 2–8, clustered in a corymbiform synflorescence, shortly pedunculate. Involucre narrowly campanulate, (5–)8–10 mm in diam. Phyllaries in 4–7 rows, blackish purple, villous, apex acuminate; outer phyllaries ovate, 3–5 × 2–3 mm; inner phyllaries narrowly ovate-elliptic, ca. 6 × 3 mm; inner phyllaries narrowly elliptic, ca. 9 × 1.5 mm. Corolla purplish red, 1.2–1.5 cm, glabrous, tube 6–9 mm, limb 5–6 mm, lobes 3–4 mm. Achene grayish, cylindrical, transversely rugose, ca. 2 mm, apex with a short crown. Pappus basally brown, apically dirty white; outer bristles scabrid, 1–2 mm, inner bristles 9–10 mm. Fl. and fr. Sep.

• Alpine grasslands, consolidated scree slopes; 3600–4300 m. NW Yunnan (Dêqên, Lijiang, Zhongdian).


高山风毛菊 gao shan feng mao ju

Herbs 20–70 cm tall, perennial. Stem solitary, straw-colored to purplish red, erect, apically branched, wingless, sparsely pubescent or subglabrous. Lower and middle stem leaves petiolate; petiole 1–4 cm; leaf blade narrowly elliptic to ovate-elliptic, 8–12(–20) × 0.7–3 cm, abaxially grayish white or grayish green and densely arachnoid to glabrescent, adaxially green and glabrous, base cuneate-attenuate, margin denticate, apex acuminate. Upper stem leaves sessile, narrowly elliptic to linear, 1–5 × 0.1–0.5 cm, gradually smaller upward on stem, base slightly amplexicaul, margin entire, apex acuminate. Capitula numerous, in a corymbiform synflorescence, shortly pedunculate. Involucre narrowly campanulate, 6–12 mm in diam. Phyllaries in 4 or 5 rows, greenish but purple apically, glabrous to sparsely villous, apex acute to subobtuse; outer phyllaries ovate-elliptic, ca. 3 × 2 mm; middle phyllaries oblong, ca. 6 × 2 mm; inner phyllaries narrowly ovate-elliptic, ca. 9 × 1.5 mm. Corolla purplish red, 1–1.2 cm, tube ca. 5 mm, limb ca. 7 mm. Achene pale brown, cylindrical, 2–3 mm. Pappus basally pale brown, apically white; outer bristles 1–3 mm, scabrid; inner bristles 7–9 mm. Fl. and fr. Aug.–Sep. 2n = 26, 52, 54.

Alpine steppes, rocky slopes, scree slopes; ca. 3000 m. N and W Xinjiang (Altay Shan, Tian Shan) [Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan] and C and N Europe.


藏新风毛菊 zang xin feng mao ju
Saussurea kuschakewiczii C. Winkler.

Herbs 2–8(–20) cm tall, perennial, almost stemless or shortly stemmed. Cauldex 2–4(–6) mm in diam., long creeping, few branched. Stem solitary, simple, erect to ascending, 1.5–3 mm in diam. Lower and middle stem leaves petiolate; petiole 0.8–4.5 cm; leaf blade ovate to elliptic, 1.5–7 × 0.5–3 cm, both surfaces grayish green, gland-dotted, and arachnoid, base cuneate, attenuate, subtruncate, margin denticate, apex acute to acuminate. Uppermost stem leaves linear, subtending synflorescence. Capitula 2–10[–20], in a dense to lax clustered corymbiform synflorescence, subsessile to shortly pedunculate. Involucre obconical to narrowly campanulate, 5–13 mm in diam. Phyllaries in 3 or 4 rows, straw-colored and sometimes tinged with purple, arachnoid tomentose to glabrescent, apex acuminate to subacute; outer phyllaries triangular-ovate, ca. 3 mm wide; middle phyllaries narrowly ovate-elliptic; inner phyllaries narrowly elliptic-linear. Receptacle naked or with few subulate bristles. Corolla pale reddish purple, 1.1–1.6 cm, glandular, tube 5–8 mm, limb 5–8 mm, lobes to 5 mm. Achene brown, 3–5 mm, usually gland-dotted. Pappus white to brownish; outer bristles 1–3 mm; inner bristles 1.1–1.4 cm. Fl. and fr. Aug.–Sep.

Alpine grasslands and meadows, moraines, rocky slopes, scree slopes, among rocks; 2500–3700[–4600] m. W Xinjiang (Wuqia) [Kashmir, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan].


假高山风毛菊 jia gao shan feng mao ju
Saussurea ambigu a Krylov ex Sergievskaya.

Herbs (4–)10–20 cm tall, perennial. Stems solitary or few, erect, simple. Basal and lower stem leaves shortly petiolate; leaf blade ovate-elliptic, 5–20 × 1–3 cm, abaxially grayish green, gland-dotted, and arachnoid, adaxially pale green and subglabrous, base attenuate, margin sparsely denticate, apex acuminate. Middle and upper stem leaves sessile, elliptic to linear, base not decurrent, margin entire. Capitula 4–12, in a clustered corymbiform synflorescence, shortly pedunculate. Involucre campanulate, (3–)5–8 mm in diam. Phyllaries in 3 or 4 rows, pale or violet-blackish; outer phyllaries ovate to ovato-oblong, pubescent, apex acuminate; inner phyllaries oblong, villous, apex subobtuse. Receptacle bristles ca. 4 mm. Corolla purple, 1.1–1.2 cm, tube 5–6 mm, limb 5–6 mm, lobes ca. 3.5 mm. Achene pale brown with dark brown spots, cylindrical, 2–4 mm, glabrous. Pappus dirty white; outer bristles 1.5–4 mm; inner bristles 8–9 mm. Fl. and fr. Jul.–Sep.

Stony and saline steppes, saline meadows; below 2900 m. N Xinjiang (Altay Shan) [SE Kazakhstan, Mongolia, Russia (Siberia)].


波缘风毛菊 bo yuan feng mao ju

Herbs to 1.2 m tall, perennial. Stem solitary, erect, apically branched, wingless, arachnoid and with yellowish brown hairs. Lower stem leaves sessile, oblong to narrowly elliptic, 7–12 × 1.5–4 cm, pinnately lobed, lyrate, or undivided, abaxially grayish green and arachnoid tomentose, adaxially dark green and sparsely strigose, base auriculate and amplexicaul, apex acute; lobes 1–4 pairs, margin denticate. Middle and upper
stem leaves narrowly elliptic, 5–8 × 1–2 cm, gradually smaller upward on stem, undivided, base rounded, margin subentire, apex acute. Capitula numerous, in a paniculiform or lax corymbiform synflorescence, pedunculate. Involucre narrowly ovoid, 8–10 mm in diam. Phyllaries in 4 or 5 rows, straw-colored but blackish brown apically and near margin, sparsely arachnoid; outer phyllaries ovate, ca. 2 × 1 mm, apex dark mucronate; inner phyllaries narrowly elliptic, to 10 × 1 mm, apex acute to obtuse. Corolla bluish purple, ca. 1 cm, tube 4–5 mm, limb ca. 5 mm, lobes ca. 2 mm. Achene glabrous. Pappus brown; outer bristles ca. 3 mm, scabridulous; inner bristles 9–10 mm. Fl. and fr. Jul–Sep.

- Montane thickets and grasslands; 2800–3300 m. SW Sichuan (Yanyuan), NW Yunnan (Lijiang).


**粗裂风毛菊** cu lie feng mao ju

Herbs 12–35 cm tall, perennial, sometimes laxly caespitose. Stems solitary or several, erect, simple, arachnoid. Basal and lower stem leaves petiolate; petiole 2–10 cm; leaf blade ovate, narrowly oblanceolate, or narrowly elliptic, (1.5–)4.5–11 × 0.9–5 cm, both surfaces pale green and sparsely arachnoid, base cuneate to attenuate, margin coarsely dentate to pinnately lobed, apex rounded, obtuse, or subacute and mucronate. Middle and upper stem leaves few, petiolate; leaf blade narrowly elliptic to linear, gradually smaller upward on stem, margin triangular-dentate to entire. Capitulum solitary, terminal on stem. Involucre campanulate, 1–1.5(–2) cm in diam. Phyllaries in 4–6 rows, blackish purple, arachnoid; outer phyllaries elliptic, ca. 12 × 4–6 mm, apex long acumenate; middle phyllaries narrowly elliptic, ca. 1.8 × 0.4–0.5 cm, apex obtuse; inner phyllaries narrowly elliptic to linear, ca. 1.8 × 0.2 cm, apex cuate-acuminata. Corolla blackish purple to bluish purple, 1.2–1.5 cm, tube 3–6 mm, limb ca. 9 mm. Achene brown, cylindrical, ca. 5 mm, glabrous. Pappus pale brown; outer bristles ca. 1 mm, scabrid; inner bristles ca. 1.2 cm. Fl. and fr. Aug–Oct.

- *Rhododendron* thickens, alpine grasslands, consolidated scree slopes; 2300–4000 m. NW Yunnan (Dali, Lijiang, Zhongdian).


**草原雪莲** cuan zhai xue lian

Herbs to 30 cm tall, perennial. Stem solitary, erect, simple, densely yellowish white villous, covered at base with brown residue of petioles. Lower stem leaves petiolate; petiole 3–6 cm; leaf blade oblanceolate, broadly linear, or narrowly elliptic, 15–18 × 1–1.2 cm, sparsely yellowish white villous, base attenuate, margin sinuate and sparsely denticulate, apex obtuse. Middle stem leaves sessile, narrowly ovate-elliptic, to 11 × 0.5 cm, margin entire. Upper stem leaves sessile, narrowly ovate-elliptic to linear, 1.3–6 × ca. 0.2 cm, base amplexicaul, apex acuminate. Capitulum solitary, terminal on stem. Involucre hemispheric, ca. 1.3 cm in diam. Phyllaries in 4 rows, purplish red, densely yellowish white villous, apex acuminate; outer phyllaries narrowly oblong-elliptic, ca. 14 × 4 mm; middle phyllaries narrowly ovate-elliptic, ca. 1.7 × 0.3 cm; inner phyllaries narrowly triangular-linear, ca. 18 × 1–2 mm. Corolla purplish red, ca. 1.7 cm, tube ca. 1 cm, limb ca. 7 mm. Achene pale brown, oblong, ca. 3.5 mm. Pappus pale brown; outer bristles ca. 3 mm; inner bristles ca. 1 cm. Fl. and fr. Jul–Sep.

- Forest margins, montane meadows; 2000–3100 m. NW Yunnan (Dali, Lijiang).

*Saussurea pratensis* was erroneously placed in *S. subg. Amphi-lera* by Lipschitz (Rod *Saussurea*, 64. 1979) and by C. Shih and S. Y. Jin (FRPS 78(2): 30, 1999), but it does not show the colored bracts typical for that subgenus.


**卷苞风毛菊** juan bao feng mao ju

*Saussurea sclerolepis* Nakai & Kitagawa; *S. sclerolepis* f. *pinнатipartita* Nakai & Kitagawa.

Herbs 10–60 cm tall, perennial. Stems solitary or few, erect, simple or few branched, sparsely stigose or glabrous. Basal and lower stem leaves petiolate; petiole 5–14 cm, winged; leaf blade ovate to narrowly ovate-elliptic, 5–15 × 2–5 cm, both surfaces green and glabrous, base cuneate, subtruncate, or cordate, margin sinuate-dentate, apex acuminata. Middle and upper stem leaves sessile or with a narrowly winged short petiole; leaf blade narrowly elliptic, base truncate to cordate-sagittate, apex acuminata. Capitulum solitary, terminal on stem or few in a lax corymbiform synflorescence, pedunculate. Involucre broadly campanulate, (1–)1.5–2(–2.5) cm in diam. Phyllaries in 6 or 7 rows, apically purple, apex acuminata and reflexed; outer phyllaries ovate to ovate-triangular, ca. 4 × 4 mm; middle phyllaries narrowly ovate-elliptic, ca. 1.7 × 0.4 cm; inner phyllaries narrowly elliptic to linear, ca. 1.8 × 0.3 cm, apex obtuse. Corolla purplish red, 1.5–1.8 cm, tube ca. 8 mm, limb ca. 1 cm. Achene pale brown, obconic, 5–5.5 mm, ribbed, glabrous. Pappus dirty white; outer bristles to 6 mm, scabrid; inner bristles ca. 1.5 cm. Fl. and fr. Jul–Sep.

- Montane grasslands, forest margins, ravines; 1700–1900 m. Hebei, Liaoning, Nei Mongol.

*Saussurea sclerolepis* was published in November 1934, whereas *S. tunglingensis* was published in May of the same year.


**折苞风毛菊** zhe bao feng mao ju


Herbs 40–100 cm tall, perennial. Stems solitary or several, erect, simple, glabrous. Basal and lower stem leaves petiolate; petiole 3–7 cm; leaf blade narrowly triangular-ovate to narrowly triangular-hastate, (3–)10–15 × (2–)2.5–6 cm, thick, pinnately lobed, both surfaces green to grayish green, thick, abaxially sparsely pubescent, adaxially sparsely stigose, base hastate to truncate, apex acute to acuminate; lateral lobes unequally...
incised, dentate, or denticulate, rarely entire. Middle stem leaves shortly petiolate, smaller; leaf blade pinnately divided or dentate. Upper stem leaves sessile, narrowly elliptic to linear, smaller, undivided. Capitula 3–5, in a clustered corymbiform synflorescence, shortly pedunculate. Involucre campanulate, 1–1.5 cm in diam. Phyllaries in 5–7 rows; outer phyllaries ovate, apex long acuminate and usually reflexed; middle phyllaries narrowly ovate-elliptic, apex acute and mucronate; inner phyllaries usually purple, linear, apex acute to obtuse. Corolla purple, 1.2–1.5 cm, tube 6–8 mm, limb 6–7 mm. Achene cylindric, 4–5 mm, glabrous. Pappus dirty white; outer bristles 2–3 mm, scabrid; inner bristles ca. 1 cm. Fl. and fr. Jul–Sep. 2n = 26.

Forest margins, thickets, grasslands; 1000–2900 m. Gansu, Heilongjiang, Jilin, ?Liaoning, Nei Mongol, Ningxia, ?Qinghai, Shaanxi [Korea, Mongolia, Russia (Far East)].

2. **ARCTIUM** group

Herbs, biennial or perennial. Capitula homogamous, bisexual. Phyllaries ending in a straight, recurved, or hooked spine. Receptacle densely covered with long bristles. Florets bisexual. Corolla ± actinomorphic. Stamen filaments distinct, glabrous or papillose. Style branches distinct and divergent. Achene glabrous; apical rim ± inconspicuous, sometimes denticulate, not forming a crown; apical plate flat. Pappus of scabrid bristles not basally connate into a ring, falling off singly, or sometimes lacking.

About four genera and ca. 700 species: NW Africa, Asia, Europe; three genera and 14 species (two endemic) in China.

1a. Outer and middle phyllaries ending in a hooked spine ................................................................. 25. *Arctium*

1b. Outer and middle phyllaries ending in a straight or recurved spine.

2a. Capitula glabrous to cobwebby, when in clusters not surrounded by leaflike lanate bracts ............................................................. 23. *Cousinia*

2b. Capitula densely lanate, in clusters surrounded by leaflike lanate bracts ..................................................... 24. *Schmalhausenia*


Herbs, biennial or perennial. Leaves divided or undivided, margin spiny or spinulose. Capitula 1 to many, forming a racemose, paniculate, or corymbose synflorescence, or solitary, glabrous to cobwebby. Involucre spherical to cylindric. Phyllaries imbricate, leathery, ending in a spine. Stamen filaments glabrous; anther with ± lacerate basal appendages. Style branches short to long, apex acute. Achene obvoid to obconic, laterally compressed, with (2–)4 or 5 raised ribs, rugose, apex ± rimmed; rim sometimes denticulate. Pappus rarely absent, when present bristles in ca. 3 rows, outer ones much shorter than inner.

About 600 species: C, S, and SW Asia; 11 species (two endemic) in China.

1a. Stems winged.

2a. Corolla yellow.

3a. Involucre 1.2–1.5 cm in diam.; leaves ± leathery ................................................................. 1. *C. dissecta*

3b. Involucre 0.6–0.9 cm in diam.; leaves thinly papery ................................................................. 2. *C. alata*

2b. Corolla red to purple.

4a. Involucre 1.2–1.5 cm in diam., glabrous; phyllaries green; leaves undivided ........................................ 3. *C. leiocephala*

4b. Involucre 1.5–2 cm in diam., densely cobwebby; phyllaries grayish white; basal and lower cauline leaves pinnately lobed ................................................................. 4. *C. platylepis*

1b. Stems unwinged.

5a. Corolla white or yellow.

6a. Involucre spherical to ovoid, 1.5–2 cm in diam.; corolla white .................................................... 5. *C. affinis*

6b. Involucre narrowly ellipsoid to cylindric, 0.6–0.8 cm in diam.; corolla yellow ................................... 6. *C. polycephala*

5b. Corolla purplish red.

7a. Stems unbranched; capitulum solitary.

8a. Involucre 4–4.5 cm in diam.; leaf segments broadly ovate ....................................................... 8. *C. sclerolepis*

8b. Involucre 1.5–2 cm in diam.; leaf segments triangular to triangular-lanceolate .................................. 9. *C. caespitosa*

7b. Stems branched; capitula several.

9a. Leaves undivided .................................................................................................................. 7. *C. kasiophylla*

9b. Basal and lower cauline leaves pectinately divided into needle-shaped segments.

10a. Capitula 4 or 5; terminal spine of leaf segments 5–10 mm .................................................. 10. *C. falconeri*

10b. Capitula numerous; terminal spine of leaf segments ca. 4 mm ........................................... 11. *C. thomsonii*

深裂刺头菊 shen lie ci tou ju

Arctium dissectum (Karelin & Kirilov) Kuntze.

Herbs 25–35 cm tall, biennial. Stems erect, apically branched, densely cobwebby; wings 2–4(–10) mm wide, with spiny teeth. Leaves ± leathery, abaxially grayish white and densely cobwebby-felted, adaxially grayish green and densely cobwebby. Basal and lower cauline leaves shortly petiolate, bipinnatisect. Middle cauline leaves sessile, bipinnatisect or pinnatisect; uppermost cauline leaves narrowly lanceolate, less divided. Capitula broadly ovoid. Involucre 1.2–1.5 cm in diam. Outer and middle phyllaries falcately recurved in distal half, apex narrowed into a spine to 3 mm; inner phyllaries narrowly lanceolate, margin ciliate, apex long acuminate. Corolla yellow. Achene ca. 5 × 1.5–2 mm, 4-ribbed, ribs apically prolonged into a tooth. Fl. and fr. May–Aug.

Sandy areas adjacent to sand dunes. NW Xinjiang [Kazakhstan].

No material of Cousinia dissecta was seen by the present authors. The description here is based on the original publication and the treatments by Tszheva (Fl. URSS 27: 160. 1962) and G. M. Shen (Fl. Xinjiang, 5: 300. 1999).


翼茎刺头菊 yi jing ci tou ju

Herbs 50–90 cm tall, perennial. Stems erect, freely branched, glabrous; wings with spiny teeth. Leaves thinly papery, sparsely cobwebby. Basal and lower cauline leaves sessile, lanceolate to elliptic, ca. 12 × 4 cm, bipinnatipartite; ultimate lobes triangular to narrowly ovate, margin entire, apex with a 1–1.5 mm spine. Middle cauline leaves similar or pinnatisect; upper cauline leaves gradually smaller upward, pinnately lobed or toothed. Capitula many, corymbose to paniculate. Involucre ovoid, 6–9 mm in diam., sparsely cobwebby. Phyllaries in ca. 9 rows; outer and middle phyllaries ± narrowly lanceolate, 4–7 × ca. 1 mm, apex narrowly into a spur or ± recurved 1.5–3 mm spine; inner phyllaries lanceolate-elliptic, 8–10 × 1–1.5 mm, apex narrowed into a spine ca. 3 mm. Corolla yellow, ca. 8 mm. Mature achene unknown. Pappus short. Fl. Jul.

Slopes, sandy places; 500–700 m. Xinjiang (Tian Shan part of Junggar Pendi) [Kazakhstan, Uzbekistan].


宽苞刺头菊 kuan bao ci tou ju


Herbs 30–60 cm tall, biennial. Stems solitary, grayish white, erect, apically or sometimes basally branched, densely cobwebby; wings 4–6 mm wide, teeth with 0.5–1.5 mm terminal spines. Leaves thinly papery, concolorous, green to grayish green, sparsely cobwebby. Basal leaves sessile, undivided, lanceolate to broadly lanceolate, margin with spiny teeth. Middle and upper cauline leaves sessile, lanceolate, 2.5–3.5 × 0.7–1.5 cm, margin spinulose and toothed, teeth with apical spines. Capitula 9–12. Involucre campanulate, 1.2–1.5 cm in diam., glabrous. Phyllaries in ca. 12 rows, green; outer and middle phyllaries triangular-subulate to linear-subulate, 5–10 × ca. 1 mm, apex narrowed into a recurved spine 0.5–2 cm; inner phyllaries linear, ca. 12 × 1 mm, abaxially striigose, margin with short cilia, apex expanded and scarious. Corolla purplish red, ca. 1.2 cm, tube 4–4.5 mm. Achene pale grayish brown variegated with dark brown, obovoid, ca. 3 mm, multistriate. Fl. and fr. Jun–Aug.

Slopes; 1100–1800 m. Xinjiang [Kazakhstan, Uzbekistan].


宽苞刺头菊 kuan bao ci tou ju

Arctium platylepis (Fischer, C. A. Meyer & Avé-Lalllemant) Kuntze.

Herbs 30–80 cm tall, biennial. Stems erect, grayish white cobwebby-felted; wings 3–4 mm wide, with spiny teeth. Leaves concolorous, grayish white, densely cobwebby-felted. Basal and lower cauline leaves sessile, lanceolate, pinnately lobed. Upper cauline leaves sessile, lanceolate, 2–2.5 × 1–1.5 cm, margin spiny or toothed, teeth spiny laterally and narrowed into a 0.5–3 mm spine; uppermost cauline leaves elliptic to ovate, ca. 10 × 4–5 mm, margin entire. Capitula several. Involucre broadly campanulate, 1.5–2 cm in diam., densely cobwebby. Phyllaries in ca. 7 rows, grayish white; outer and middle phyllaries triangular, triangular-lanceolate, or elliptic, 3–10 × 1–3 mm, apex narrowed into a ca. 2 mm spine; inner phyllaries elliptic, ca. 11 × 3 mm, apex rigid, expanded, scarious, and mucronulate; innermost phyllaries broadly linear, ca. 14 × 2 mm, apex obtuse to rounded. Corolla red, ca. 1.2 cm, tube ca. 5 mm. Achene yellowish, ellipsoidal, ca. 1.8 mm, multistriate. Fl. and fr. May–Aug.

Slopes; 1200–2000 m. NW Xinjiang [Kazakhstan, Uzbekistan].


刺头菊 ci tou ju

Arctium affine (Schrenk ex Fischer & C. A. Meyer) Kuntze; Cousinia wolgensis (M. Bieberstein ex Willdenow) C. A. Meyer ex Candolle var. affinis (Schrenk ex Fischer & C. A. Meyer) Regel.

Herbs 15–40 cm tall, perennial. Rootstock thick, densely cottony and covered with petiole remains. Stems erect, unbranched or apically branched, unwinged, thickly grayish white felted to glabrescent or glabrous. Leaves abaxially grayish white and thickly felted, adaxially green and sparsely cobwebby. Basal leaves with a brown winged petiole; leaf blade elliptic to oblanceolate, 8–12 × 2–4 cm, margin toothed or lobed; teeth or lobes ± broadly ovate to semiorbiculair, margin with 0.5–1 mm spines, apex with 2.5–5 mm spine. Lower and middle cauline leaves sessile, gradually smaller, base auriculate
and semiamplexicaul, otherwise similar to basal leaves or ± narrowly ovate, smallest uppermost ones ovate. Capitula several. Involucre globose to ovoid, 1.5–2 cm in diam., glabrous or sparsely cobwebby. Phyllaries in ca. 9 rows; outer and middle phyllaries subulate, ovate-elliptic or ovate, 8–12 × 2–3 mm, margin ciliate, apex abruptly constricted into a recurved 4–5 mm spine; inner phyllaries elliptic to broadly linear, ca. 15 × 2–2.5 mm, apex narrowed into a short spine; innermost phyllaries oblancoceolate, ca. 18 × 2 mm, abaxially striigose, margin with short cilia, apex with a short spine. Corolla white, ca. 2.3 cm, tube ca. 5 mm. Achene narrowly obovoid, ca. 4 mm, 4-ribbed, ribs apically prolonged into a tooth. Fl. and fr. Jun–Sep.

Deserts, dunes; 400–800 m. Xinjiang (Junggar Pendi) [Kazakhstan, Mongolia].


多花刺头菊 duo hua ci tou ju

Arctium polycephalum (Ruprecht) Kuntze.

Herbs to 1 m tall, perennial. Stems erect, branched from middle or apically, unwinged, cobwebby. Leaves leathery, abaxially grayish white and sparsely to thickly felted, adaxially green and sparsely cobwebby. Basal leaves petiolate; leaf blade elliptic-lanceolate, 15–50 × 5–11 cm, pinnatisect; segments triangular, margin with spiny teeth. Lower cauline leaves similar to basal leaves but sessile and smaller. Capitula many, corymbose. Involucre narrowly ellipsoid to cylindric, 6–8 mm in diam., cobwebby. Phyllaries in 3 or 4 rows; outer phyllaries 4–5 mm, apex narrowed into a short spine; middle phyllaries narrowly ovate to narrowly lanceolate, ca. 3 × as long as outer ones, apex narrowed into a long spine; inner phyllaries linear. Corolla yellow. Achene obconic, 4–5 mm, 3- or 4-ribbed, ribs apically prolonged into a tooth. Fl. and fr. Jul–Aug. 2n = 24.

Rocky slopes in mountains. Xinjiang (W Tian Shan) [Tajikistan].

No material of Cousinia polycephala from China was seen by the present authors, and the description here is based on the treatment by Tscherneva (FL URSS 27: 206. 1962).


丛生刺头菊 con sheng ci tou ju

Herbs to 40 cm tall, biennial. Stems erect, unwinged; branches purplish red, long, striate, sparsely felted to glabrescent. Leaves abaxially grayish green and sparsely cobwebby-felted, adaxially green and sparsely cobwebby. Middle cauline leaves sessile, oblong-elliptic, 9.5–14.5 cm, undivided, margin with 0.5–1.5 mm spines or teeth with curved 2.5–5 mm spines, apex narrowed into a rigid spine. Upper cauline leaves ovate, ovate-lanceolate, or elliptic, 4.5–6 × 3.5–4 cm, margin spiny or with laterally and apically spiny teeth; uppermost leaves oblancoceolate, ca. 4 × 1 cm, margin entire and unarmed. Capitula several. Involucre broadly campanulate, 4.5–5 cm in diam., fluffily cobwebby. Phyllaries in ca. 7 rows; outer and middle phyllaries triangular-lanceolate, 2.6–3.2 × 0.5–0.6 cm, leathery, with a medial abaxial ridge, apex with a triquetrous rigid 3–5 mm spine; inner and innermost phyllaries elliptic-lanceolate, linear, or narrowly linear, 2.5–2.8 × 0.1–0.3 cm, rigid, apex scarious and acuminate to acute. Corolla purplish red, ca. 2.2 cm, tube ca. 1 cm. Achene variegated with brown, obovoid, ca. 5 mm. Fl. and fr. Jul.

- Grasslands on mountain slopes; 3000–3200 m. W Xinjiang (Wuqa).


硬苞刺头菊 ying bao ci tou ju

Herbs to 30 cm tall, biennial. Stems purplish red, tufted, erect, unbranched, unwinged, densely fluffily cobwebby. Leaves papery, ± concolorous, grayish green, sparsely cobwebby. Basal leaves with petiole ca. 6 cm; leaf blade elliptic, 12 × 6 cm, pinnatifid or pinnatipartite; segments 5 or 6 pairs, broadly ovate, margin with 3–7 unequal teeth with 3–6 mm lateral spines, apical spine to 1 cm. Cauline leaves similar to basal leaves but sessile; upper cauline leaves lanceolate, smaller. Capitulum 1. Involucre broadly campanulate, 4–4.5 cm in diam., fluffily cobwebby. Phyllaries in 6 or 7 rows; outer and middle phyllaries elliptic-subulate to lanceolate-subulate, 1.8–3.3 × 0.3–0.4 cm, rigid, leathery, with a medial abaxial ridge, apex narrowed into a rigid triquetrous spine; inner and innermost phyllaries oblancoceolate to broadly linear, ca. 2.3 × 0.2–0.3 cm, rigid, apex scarious, yellowish, and slightly expanded. Corolla purplish red, ca. 2 cm, tube ca. 1.2 cm. Achene pale, obliquely obovoid, ca. 5 mm, darkly striate. Pappus absent. Fl. and fr. Jul.

- Mountain slopes; ca. 3200 m. W Xinjiang (Wuqa).


丛生刺头菊 cong sheng ci tou ju

Herbs 8–14 cm tall, perennial. Rootstock well developed. Stems many, tufted, unbranched, unwinged, cobwebby. Leaves ± concolorous, grayish white, sparsely cobwebby. Basal leaves with winged petiole 1–2 cm; leaf blade elliptic, 1–2 × 0.8–1.3 cm, pinnatisect; segments 4–6 ± opposite pairs, triangular to triangular-lanceolate, patent at right angle, margin revolute, apical spine 1–2 mm. Cauline leaves few, similar to basal leaves but smaller, sessile. Capitulum 1. Involucre bowl-shaped, 1.5–2 cm in diam., sparsely cobwebby. Phyllaries in ca. 5 rows, abaxially purplish red; outer and middle phyllaries triangular, 5–12 × 1.5–2 mm, apex narrowed into a 1.5–2 mm spine; inner phyllaries broadly linear, ca. 15 × 1 mm, apex acuminate. Corolla purplish red, ca. 1.2 cm, tube ca. 9 mm. Achene brown, ca. 5.5 mm, ribs apically prolonged into a tooth. Fl. and fr. Jul.–Sep.

Rocky mountain slopes; ca. 3200 m. W Xinjiang (Wuqa) [Kazakhstan].


穗花刺头菊 sui hua ci tou ju

Herbs 30–100 cm tall, biennial. Stems grayish white, erect, apically branched, unwinged, felted. Leaves leathery, abaxially grayish white and densely felted, adaxially green to yellowish
green and glabrous. Basal leaves with petiole ca. 3 cm; leaf blade ca. 10 × 5 cm, ± pinnatisect; segments needle-shaped, patent at right angle, margin entire and revolute, midvein thick and abaxially raised, apex narrowed into a yellow rigid 5–10 mm spine. Cauline leaves similar to basal leaves but sessile; upper cauline leaves lanceolate, smaller, semiamplexicaul. Capitula spicate by 4 or 5 near apex of stem and branches. Involucre subglobose, 3–5 cm in diam., densely and fluffily cobwebby. Phyllaries in ca. 9 rows, rigid, leathery; outer and middle phyllaries lanceolate, 1.9–2.2 cm × ca. 0.4 mm, apex narrowed into a straight 2–4 mm spine; inner phyllaries narrowly lanceolate, 1.8–2 × ca. 0.3 cm, apex narrowed into a ca. 2.5 mm spine. Corolla purplish red. Mature achene unknown. Fl. Jun.

Slopes, gravelly places in flooded lands; 4100–4400 m. W Xizang [India, Pakistan].

11. Cousinia thomsonii C. B. Clarke, Compos. Ind. 213. 1876.

毛苞刺头菊 mao bao ci tou ju

Herbs 30–80 cm tall, biennial. Rootstock covered with petiole remains. Stems grayish white, erect, apically branched, unwinged, thickly cobwebby-felted. Leaves leathery, abaxially grayish white and thickly felted, adaxially green and glabrous. Basal and lower cauline leaves with a brown winged petiole; leaf blade elliptic to oblanceolate, 12–13 × 3–3.5 cm, pinnatisect; segments 6–11 pairs, needle-shaped to triangular-subulate, patent at right angle, margin entire and revolute, midvein thick and abaxially raised, apex narrowed into a rigid ca. 4 mm spine. Middle cauline leaves sessile, similar to lower ones or lanceolate to elliptic-lanceolate, semiamplexicaul. Capitula many. Involucre subspherical, 3–4 cm in diam., densely and fluffily cobwebby. Phyllaries in ca. 9 rows, rigid, leathery, abaxially purplish red; outer phyllaries triangular, 1.8–2.3 × 0.4–0.5 cm, apex narrowed into a rigid 3–4 mm spine; middle and inner phyllaries lanceolate, ca. 2.3 × 0.2–0.4 cm, apex narrowed into a 1.5–2.5 mm spine. Corolla purple to pink, ca. 1.4 cm, tube ca. 7 mm. Achene brown, obovoid, ca. 5 mm, 1-ribbed on each side. Fl. and fr. Jul–Sep.

Grasslands, gravelly places in flooded lands; 3700–4300 m. S Xizang [India, Nepal, Pakistan].


虎头蓟属 hu tou ji shu

Shi Zhu (石铸 Shih Chu); Werner Greuter

Herbs, perennial. Leaves bipinnatisect, with spiny lobes. Capitula many, clustered at apex of stem, surrounded by leaflike densely lanate bracts. Involucre campanulate, densely and fluffily lanate. Phyllaries imbricate, apex a long spine. Stamen filaments minutely papillose; anther with short, lacerate basal appendages. Achene obovoid, laterally compressed, with 4–6 ribs each ending in a small tooth, rugose, apex with a denticulate rim. Pappus of ca. 3 rows of bristles, outer ones much shorter than inner.

One species: China, Kazakhstan.


虎头蓟 hu tou ji

Cirsium nidulans Regel, Bull. Soc. Imp. Naturalistes Moscou 40(3–4): 160. 1867; Arctium eriophorum (Regel & Schmalhausen) Kuntze; Carduus horridus (Ruprecht) B. Fedtschenko (1912), not Adams (1805); Cousinia eriophora Regel & Schmalhausen; Jurinea horrida Ruprecht; Schmalhausenia eriophora (Regel & Schmalhausen) C. Winkler.

Herbs to 25 cm tall. Stem solitary, erect, thick, hollow, unbranched, densely and fluffily cobwebby-felted, base covered with petiole remains. Leaves concolorous, grayish white or grayish green, densely and fluffily villous. Basal leaves petiolate; leaf blade elliptic-oblanceolate, 35–40 × 10–14 cm; ultimate lobes lanceolate, apex narrowed into a long spine. Cauline leaves similar but sessile, smaller, sometimes narrowly elliptic. Capitula 5–10. Involucre 2.2–4 cm in diam. Phyllaries in 3 or 4 rows, narrowly lanceolate, apex narrowed into a long subulate spine; outer and middle phyllaries abaxially brown villous. Corolla purple. Achene ca. 5 mm, wrinkled, ribs prolonged into a small tooth. Pappus bristles brown, to 1.3 cm, unequal. Fl. and fr. Jul–Sep.

Meadows; ca. 3600 m. NW Xinjiang [Kazakhstan].


牛蒡属 niu bang shu

Bardana Hill; Lappa Scopoli.

Shi Zhu (石铸 Shih Chu); Werner Greuter

Herbs, biennial [or perennial]. Leaves simple, margin sparsely denticulate to subentire. Capitula many, glabrous or cobwebby, forming a corymbose [or racemose] synflorescence. Phyllaries (except sometimes innermost) narrowed into a slender hooked spine. Stamen filaments papillose; anther with subentire to lacerate basal appendages. Style branches linear. Achene obovoid to narrowly ellipsoid, laterally compressed, rugose, striate or ribbed, apex inconspicuously rimmed. Pappus of ca. 3 rows of bristles, outer ones very short.

Eleven species: N Africa, Asia, Europe; two species in China.
1a. All phyllaries narrowed into a slender hooked spine; involucre minutely glandular pubescent but not cobwebby ....... 1. Arctium lappa

1b. Inner phyllaries apically expanded into a dark purple ± truncate appendage; involucre ± densely cobwebby .... 2. Arctium tomentosum


Arctium leiospermum Juzepczuk & Ye. V. Sergievskaja; A. majus Bernhardi, nom. illeg. superfl.; Lappa major Gaertn., nom. illeg. superfl.; L. vulgaris Hill.

Herbs to 2 m tall, biennial. Stem purplish, erect, stout, apically branched, sparsely cobwebby; branches ascending. Leaves abaxially grayish white or pale green and thinly felted, adaxially green, sparsely striigose, and yellow-gold dotted. Basal leaves with petiole ca. 32 cm; leaf blade broadly heart-shaped, ca. 30 × 21 cm, margin entire and repand to mucronulate denticate. Cauine leaves similar to basal leaves or ovate; uppermost cauline leaves ovate to shallowly cordate, smaller. Capitula few to many, ± corymbose. Involucr ovoid, 1.5–2 cm in diam., glabrous except for minute glandular hairs. Phyllaries all with a hooked apex; outer phyllaries triangular to lanceolate-subulate, ca. 15 × 1 mm; middle and inner phyllaries lanceolate to linear-subulate, ca. 15 × 1.5–3 mm. Corolla purplish red, ca. 1.4 cm, tube ca. 8 mm. Achene pale brown variegated with dark brown or concolorous, narrowly sometimes obliquely obovoid, 5–7 mm, multistriate. Pappus bristles to 3.5 mm. Fl. and fr. Jun–Sep. 2n = 18, 34, 36.

Near villages, roadsides, near rivers, wet and waste places, forest margins, thickets, valleys, slopes; 700–3500 m. Throughout China except for Hainan, Taiwan, and Xizang [Afghanistan, Bhutan, India, Japan, Nepal, Pakistan; SW Asia, Europe].

Arctium lappa is cultivated almost throughout China. The achenes and roots are used medicinally.

2. Arctium tomentosum Miller, Gard. Dict., ed. 8, Arctium no. 3. 1768.

Lappa tomentosa (Miller) Lamarck.

Herbs to 2 m tall, biennial. Stem erect, branched, sparsely cobwebby; branches ascending. Leaves abaxially grayish white and densely felted, adaxially green and glabrous. Basal leaves petiolate; leaf blade heart-shaped, 25–50 × 10–30 cm, margin sparsely denticulate, teeth sinuose or mucronulate, apex acute to obtuse and mucronulate. Cauline leaves similar to basal leaves; uppermost cauline leaves sessile, ovate to ovate-elliptic. Capitula few to many, ± corymbose. Involucr ovoid, 1.5–2 cm in diam., ± densely cobwebby. Outer phyllaries subulate, triangular-subulate, or lanceolate, ca. 6 × 1 mm; middle phyllaries linear-subulate, 10–14 × ca. 2 mm, all with a hooked apex; inner phyllaries lanceolate to linear-lanceolate, apex acuminate. Corolla purplish red, 0.9–1.2 cm, tube 4.5–6 mm. Achen pale brown variegated with dark brown, narrowly obovoid, ca. 5.6 mm, multistriate. Pappus bristles pale brown, ca. 3 mm. Fl. and fr. Jul–Sep.

Grasslands; 1200–2100 m. Xinjiang (Tian Shan) [Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Uzbekistan; Europe].

The above description of Chinese plants does not match typical Arctium tomentosum, which, as mentioned in the key, is characterized by inner phyllaries with a dark purple, expanded, truncate apical portion. The identity of the plant in Xinjiang requires confirmation.

3. ONOPORDUM group

大翅菊群 da chi ji qun
Shi Zhu (石铸 Shih Chu); Werner Greuter

Herbs, biennial or perennial. Capitula homogamous, bisexual. Phyllaries pointed, often ending in a straight or recurved spine. Receptacle densely covered with bristles or naked and alveolate. Florets bisexual. Corolla ± actinomorphic. Stamen filaments distinctly cucumiform. Stamen filaments distinct, glabrous or papillose. Style branches coherent for most of their length. Achene glabrous; apical rim sometimes inconspicuous or ciliolate. Pappus bristles to 3.5 mm. Fl. and fr. Jun–Sep. 2n = 18, 34, 36.

Nine genera and ca. 90 species: N Africa, Asia, Europe; seven genera (one endemic) and 17 species (five endemic) in China.

1a. Receptacle naked and alveolate ........................................................... 31. Onopordum

1b. Receptacle covered with bristles.

2a. Outer pappus of filiform bristles and inner pappus of narrow scales ending in a barbelleate subulate tip .... 30. Syreitschikovia

2b. Pappus (when present) of bristles only.

3a. Pappus bristles plumose ........................................................................ 32. Ancathia

3b. Pappus bristles scabrid or barbellate.

4a. Corolla yellow.

5a. Plants stemless; capitula basal, shortly pedunculate, in center of leaf rosette ...................... 29. Xanthopappus

5b. Plants caulescent; capitula terminal on stem and branches ........................................ 27. Alfredia

4b. Corolla purple, red, blue, or rarely white.

6a. Basal and lower cauline leaves heart-shaped to triangular-sagittate, undivided .................... 26. Synurus

6b. Basal and lower cauline leaves linear to elliptic, ± deeply pinnately divided .................. 28. Olgaea

CARDUEAE

山牛蒡属 shan niu bang shu

Shi Zhu (石铸 Shih Chu); Werner Greuter

Herbs, perennial. Leaves heart-shaped to triangular-sagittate, undivided or sometimes pinnately divided, margin toothed or merely spinulose denticulate. Capitula large, nodding. Involucre globose. Phyllaries imbricate, lanceolate to linear-lanceolate, rigid, apex long acuminate. Receptacle with long bristles. Corolla purple. Stamen filaments glabrous; anther with long, strongly lacerate basal appendages laterally fused into a tubular sheath enclosing distal part of filament. Style branches short. Achenes obovoid, laterally compressed, longitudinally striate but otherwise smooth; apical rim forming a crenulate crown; apical plate with a low central pyramidal non-oleaginous body crowned by a cupular disk. Pappus of 3 or 4 rows of scabrid bristles, outer ones less than 1/2 as long as inner ones.

One species: China, Japan, Korea, Mongolia, Russia.


山牛蒡 shan niu bang

Onopordum deltoides Aiton, Hort. Kew. 3: 146. 1789; Carduus atriplicifolius Fischer ex Hornemann; Centaurea atriplicifolia (Fischer ex Hornemann) Matsumura; Cirsium ficifolium Fischer; Rhaponticum atriplicifolium (Fischer ex Hornemann) Candolle; Serratula atriplicifolia (Fischer ex Hornemann) Schultz Bipontinus; S. excelsus Makino; S. deltoides (Aiton) Makino; S. deltoides var. palmatopinnatifida Makino; S. pungens Franchet & Savatier (1878), not Poiret (1805); Synurus atriplicifolius (Fischer ex Hornemann) Iljin; S. excelsus (Makino) Kitamura; S. hondae Kitagawa; S. palmatopinnatifidas (Makino) Kitamura; S. pungens Kitamura; S. pungens var. giganteus Kitamura.

Herbs 0.7–1.5 m tall. Rootstock stout. Stem solitary, erect, ribbed, branched or unbranched, basally densely felted to glabrescent or glabrous. Leaves abaxially grayish white and densely felted, adaxially green, asperous, and setulose. Basal and lower cauline leaves with narrowly winged petiole to 34 cm; leaf blade cordate, ovate, broadly ovate, ovate-triangular, or hastate, 10–26 × 12–20 cm, base cordate, sagittate, or truncate. Upper cauline leaves gradually smaller upward, sessile or shortly petiolate, ovate, elliptic, or elliptic-lanceolate, margin toothed to spiny. Capitula several. Involucre 3–6 cm in diam., densely and fluffily cobwebby to glabrous. Phyllaries in 13–15 rows; outer and middle phyllaries lanceolate, 7–23 × 3–4 mm, patent to reflexed; inner phyllaries longest, linear-lanceolate, 2.3–2.5 × ca. 0.2 cm, sometimes purple. Corolla ca. 2.5 cm, tube ca. 9 mm. Achenes brown, narrowly ellipsoid, ca. 7 mm, apex truncate. Pappus bristles brown, 1.5–2 cm. Fl. and fr. Jun–Oct. 2n = 26.

Forest margins, forests, meadows; 500–2200 m. Anhui, Chongqing, S Gansu, Hebei, Heilongjiang, Henan, Hubei, N Hunan, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, E Shandong, S Shandong, Zhejiang [Japan, Korea, Mongolia, Russia].


翅膜菊属 chi mo ju shu

Shi Zhu (石铸 Shih Chu); Werner Greuter

Herbs, perennial, caulescent. Stem solitary, erect, sulcate, unwinged. Leaves subentire to pinnatipartite, with spiny or spinulose teeth or segments. Capitula large, nodding. Involucre campanulate. Phyllaries numerous, abaxially with appressed tortuous blackish hairs and often white cobwebby, with membranous wings or appendage. Receptacle flat, with dense long bristles. Corolla yellow [or purple]. Stamen filaments glabrous or papillosus; anther tails long, subentire to lacerate. Style branches short, apex rounded. Achenes narrowly obovoid to narrowly ellipsoid, laterally compressed, often with 12–20 thin inconspicuous ribs, otherwise smooth; apical rim forming a low crown; apical plate with a central pyramidal body of sclerenchyma crowned by a stout disk. Pappus of 3–5 rows of barbellate bristles, outer ones ca. 1/2 as long as inner ones, inner ones gradually wider and flattened.

Six species: C Asia; five species (two endemic) in China.

1a. Outer and middle phyllaries distally with a scarious denticate to lacerate appendage, apically narrowed into a 1–4 mm spine.

2a. Leaves papery, undivided ................................................................. 4. A. cernua

2b. Leaves leathery, pinnately divided ................................................................. 5. A. fetissowii

1b. Outer and middle phyllaries laterally expanded into membranous fimbriate-lacerate wings, apically narrowed into a ca. 10 mm spine.

3a. Leaves leathery, with slender 5–10 mm spines .................................................. 1. A. nivea

3b. Leaves papery, with 1–4 mm spines.

4a. Basal and lower cauline leaves pinnately divided, terminal lobe cuneate at base; capitula nodding ............... 2. A. aspera

4b. Basal and lower cauline leaves with lobed petiole and large undivided blade truncate to cordate at base; capitula erect ................................................................. 3. A. acantholepis


Alfredia karelinii Ledebour, nom. illeg. superfl.; A. tianschanica Ruprecht; Carduus tianschanicus (Ruprecht) B. Fedtschenko.

Herbs 40–120 cm tall. Stem purplish red, stout, unbranched or rarely with 1 branch, with sparse appressed long white hairs. Leaves papery, abaxially grayish white and thickly felted, adaxially green, asperulous, and strigose, margin densely ciliate with 1–2 mm spines. Basal and lower cauleine leaves petiolate; petiole 8–10 cm, winged, distally lobed, lobes in 2 or 3 pairs, elliptic to ovate, and small; leaf blade otherwise undivided, ovate, 11–13 × 5–8 cm, base cordate to truncate. Middle cauleine leaves similar but sessile; upper cauleine leaves narrowly ovate, small, semiamplexicaul. Capitula 1 or 2, erect. Involucre broadly campanulate, 4–6 cm in diam. Outer and middle phyllaries lanceolate to needle-shaped, 1.2–2.4 × 0.3–0.5 cm, middle portion laterally expanded into scarioso fimbriate-lacerate wings, apex narrowed into a ca. 1 cm spine; inner phyllaries linear-lanceolate, ca. 3 × 0.3 cm, rigid, scarios, margin sometimes expanded into small fimbriate-lacerate scarios wings. Corolla yellow, ca. 2.2 cm, tube ca. 8 mm. Achene cream-colored variegated with brown, obliquely narrowly ovobovoid, ca. 7 mm, compressed, inconspicuously multistriate. Pappus bristles to 2 cm, fragile. Fl. and fr. Jul.–Oct.

Grasslands in river valleys, trailsides, Picea forests; 1400–2400 m. Xinjiang (Altay Shan) [Kazakhstan, Russia].

CARDUEAE

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Leaves leathery, abaxially grayish white and densely felted, adaxially green and glabrous, margin with acicular spines to 5 mm. Lower cauline leaves with petiole 7–14 cm; leaf blade elliptic, 17–30 × 4–8 cm, pinnately divided; segments 4–6 pairs, elliptic to ovate. Middle and upper leaves similar but sessile, sometimes lanceolate to oblanceolate. Capitula 1 or 2, nodding. Involucre 5–7 cm in diam. Outer and middle phyllaries lanceolate to broadly linear, 0.8–3 × 0.2–0.4 cm, distally expanded into a scarios lacerate appendage apically narrowed into a 1–1.5 mm spine; inner phyllaries linear, ca. 3 × 0.3 cm, lacking an appendage. Corolla yellow, ca. 2.7 cm, tube ca. 9 mm. Achene brown, narrowly obovoid, ca. 5 mm, multistriate and with numerous ribs. Pappus bristles to 2.8 cm, serrulate. Fl. and fr. Jul–Aug.

- Mountain slopes, ravines; 2100–2800 m. Xinjiang (Tian Shan).


蝟菊属  wi ju shu
Shi Zhu (石铸 Shih Chu); Werner Greuter

Takeikadzuchia Kitagawa & Kitamura.

Herbs, perennial. Leaves linear to elliptic, pinnately divided, with spiny teeth or segments. Capitula few to many, solitary or glomerate. Involucre campanulate, semiglobose, or ovoid. Phyllaries rigid, leathery, straight or apically recurved. Receptacle flat, with dense long bristles. Corolla purple to blue. Stamen filaments glabrous or subglabrous; anther with long ± entire basal appendages. Style branches slender, apex obtuse to rounded. Achene narrowly ellipsoid to obovoid, laterally compressed, often with 12–15 ribs but otherwise smooth; apical rim forming a crenulate crown; apical plate with central pyramidal body of sclerenchyma crowned by a stout disk. Pappus bristles 3–5 rows, barbellate, outer ones somewhat shorter than inner.

About 16 species: mostly in C Asia; six species (two endemic) in China.

1a. Stem winged.

1b. Stem unwinged.

1b. Capitula clustered at end of unbranched stem; involucre sparsely cobwebby ................................................... 4.


火媒草 huo mei cao

Carduus leucophyllus Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 5: 194. 1832; Olgaea leucophylla var. aggregata Y. Ling; O. leucophylla var. albiflora Y. B. Chang; O. leucophylla var. jucunda Iljin.

Lower cauline leaves similar but sessile; upper cauline leaves gradually smaller upward, ± narrowly elliptic, lanceolate, or narrowly triangular, less divided to entire. Capitula (1 or) few to many. Involucre campanulate to hemispheric, 5–7 cm in diam., sparsely cobwebby. Phyllaries narrowed into long spines; outer and middle phyllaries linear-triangular, 8–24 × 1–2 mm; inner phyllaries similar but longer, ca. 3.5 × 0.2 cm. Corolla purple, ca. 3 cm, tube ca. 1.2 mm. Achene cuneate-obovoid, ca. 6 mm, with a repand apical rim. Pappus bristles brown, to 2 cm, slender. Fl. and fr. Jul–Oct.

Valleys, slopes, sandy areas, riverbeds; 800–2300 m. C Gansu, Hebei, N Jilin, Nei Mongol, N Ningxia, Shaanxi, Shansi [Mongolia].

Herbs 15–80 cm tall. Stems grayish white, erect, branched from base or unbranched, stout, densely cobwebby-felted; wings wide, pachymentlike, spiny, toothed, or lobed. Leaves grayish white, subconcolorous, abaxially cobwebby-felted, adaxially ± densely cobwebby. Basal leaves with thick densely felted petiole; leaf blade ± narrowly elliptic, 12–20 × 3–5 cm, pachymentlike, shallowly pinnately lobed or toothed; segments or teeth 7–10 pairs, triangular to semiorbiculur, with lateral spines and a brown to yellowish 5–6 mm apical spine. Middle cauline leaves similar or elliptic to elliptic-lanceolate, sometimes undivided; upper cauline leaves elliptic, lanceolate, or narrowly triangular, smaller. Capitula few to many. Involucre campanulate, 3–4 cm in diam., glabrous or subglabrous. Phyllaries distally narrowed into a spine; outer phyllaries triangular, 10–15 × 2.5–3 mm, recurved; middle phyllaries lanceolate to elliptic-lanceolate, 1.8–2.5 × ca. 0.3 cm; inner phyllaries linear-elliptic to broadly linear, 3.2–3.6 × ca. 0.2 cm. Corolla purple or white, ca. 3.3 cm, tube ca. 8 mm. Achene yellowish variegated with brown, narrowly ellipsoid, ca. 1 cm, 10-ribbed. Pappus bristles pale brown, to 2.5 cm. Fl. and fr. May–Oct.


Herbs 20–100 cm tall. Stems solitary or up to 3, erect, usually long branched, sparsely cobwebby, base covered with petiole remains; wings wide, leathery, unequally spiny toothed. Leaves leathery, discolorous, abaxially grayish white and densely thickly felted, adaxially green and glabrous. Basal leaves with a brown fibrous basally thickened petiole; leaf blade ± broadly linear, ca. 33 × 3 cm, pinnately lobed or pinnatifid; segments ca. 10 pairs, triangular, with 2 or 3 unequal teeth each with 2 or 3 lateral spines and a brown to yellowish 3–4 mm apical spine. Basal leaves similar but sometimes undivided, narrowly triangular, smaller, with spiny teeth. Involucre campanulate, 3–4 cm in diam., glabrous. Outer phyllaries triangular, 5–10 × 1–1.5 mm, apex recurved to patent and spiniform; middle phyllaries lanceolate to linear-lanceolate, 10–17 × 1–1.5 mm, apex similar to outer ones; inner phyllaries linear, ca. 2.3 × 0.1 cm, apex narrowed into a long spine. Corolla purple to bluish purple, ca. 2.7 cm, tube ca. 1.7 cm. Achene pale yellowish variegated with brown, long cuneate-ellipsoid, ca. 6 mm. Pappus bristles pale brown to pale brick colored, to 1.5 cm. Fl. and fr. Jun–Sep.

Herbs 20–25 cm tall. Stem solitary, grayish white, erect, unbranched, unwinged, lanate. Leaves leathery, discolorous, abaxially grayish white and thickly lanate, adaxially green, glabrous, and shiny. Middle cauline leaves sessile, elliptic, 10–20 × 2.5–4 cm, pinnatifid or pinnatipartite; segments 7–10 pairs, broadly ovate to broadly triangular, with 3–5 teeth tipped with 3–10 mm spines; upper cauline leaves toothed, with unequal triangular spine-tipped and pectinately spiny teeth. Involucre ovoid to campanulate, 2.5–3.5 cm in diam., densely lanate. Outer phyllaries lanceolate-subulate, ca. 2 × 0.3 cm, apex narrowed into a pungent ca. 1.1 cm spine; middle phyllaries ± narrowly elliptic to linear-subulate, 2.5–3 × 0.2–0.3 cm, with a 1.2–1.5 cm apical spine; inner phyllaries lanceolate to linear-lanceolate, 2.5–3 × 0.1–0.3 cm, apex acuminate and softly spiny. Corolla purple, ca. 2.2 cm, tube ca. 1.4 cm. Achene gray and dark variegated, long cuneate-ellipsoid, ca. 7 mm. Pappus bristles brownish, to 2 cm. Fl. and fr. Jul.


cm; leaf blade linear-elliptic to lanceolate-elliptic, 10–20 × 3.5–5.5 cm, pinnately lobed or pinnatifid; segments 9–11 pairs, semirotund to broadly triangular, with marginal spinules of to 1 mm and 3–5 teeth with a yellowish 4–6 mm apical spine. Middle and upper cauline leaves similar but shortly petiolate or sessile. Capitula 5–9, clustered at end of stem, without small capitula present in leaf axils below main cluster. Involucre broadly campanulate, ca. 4.5 cm in diam., densely lanate; outer and middle phyllaries lanceolate-subulate, ca. 2 cm × 3.5 mm, apex narrowed into a short weak spine; inner phyllaries ± broadly linear, 2.5–3 × ca. 0.2 cm, apex acuminate. Corolla purplish red, ca. 2.9 cm, tube ca. 1.2 cm. Achene obconic, 6–7 mm. Pappus bristles yellowish, to 2.5 cm. Fl. and fr. Jul–Aug.

River valleys, gravelly places along rivers; 1800–2100 m. Xinjiang (Tian Shan) [Kazakhstan].


Herbs, perennial, stemless. Leaves all basal, rosulate, pinnatifid, with spiny lobes. Capitula basal, large, shortly pedunculate, clustered in center of leaf rosette. Phyllaries ending in a straight or ± falcate keeled spine. Receptacle concave, covered with bristles. Corolla yellow. Stamen filaments glabrous; anther with long, subentire basal appendages. Style branches short, apex truncate. Achene (immature) narrowly obovoid, inconspicuously striate but otherwise smooth; apical rim forming an entire conspicuous crown; apical plate with shortly cylindric cup-shaped disk surmounted by a cylindric hardened style base. Pappus of ca. 5 rows of scabrid bristles of almost equal length.

● One species: China.


Herbs 15–50 cm tall. Rootstock branched, densely covered with dark scales. Stems erect, unbranched, slender, unwinged, cobwebby to glabrescent. Leaves sessile, linear to linear-lanceolate, 3–20 × 0.4–0.7 cm, soft, abaxially grayish white and densely thickly felted, adaxially green and glabrous, base narrowed, apex acuminate to acute. Involucre 0.8–1.2 cm in diam., glabrous or subglabrous. Phyllaries in 6 or 7 rows; outer phyllaries broadly triangular to ovate, 3–3.5 × ca. 2 mm, apical spine ca. 0.5 mm; middle and inner phyllaries ovate, elliptic, or broadly linear, 6–11 × 1–1.5 mm, apical spine 1–2 mm. Corolla blue to purplish red, ca. 1.3 cm, tube ca. 6 mm. Achene ellipsoid, 6–7 mm, with toothed apical rim. Pappus scales of inner row 0.8–1.2 cm, longer than outer row. Fl. and fr. Jun–Jul.

Grasslands on rocky mountain slopes; 1200–1700 m. Xinjiang (Tian Shan) [Kazakhstan].

*大翅蓟属 da chi ji shu*

Shi Zhu (石铸 Shih Chu); Werner Greuter

*Acanos* Adanson.

Herbs, biennial. Stems erect, with spiny wings. Leaves toothed or pinnately lobed, spiny. Capitula single or few. Phyllaries numerous, imbricate, apex reflexed but not hooked. Receptacle naked, alveolate. Stamen filaments papillose; anther with short entire to lacerate basal appendages. Style branches long. Achene ovoid, laterally compressed, with 3–5 ribs ending in inconspicuous apical rim; apical plate flat, disk not protruding. Pappus of 1 or several rows of scabrid or plumose bristles of unequal length.

About 40 species: C and SW Asia, Europe; two species in China.

1a. Pappus bristles scabrid; outer and middle phyllaries with divaricate to reflexed apex .............................................  1. *O. acanthium*

1b. Pappus bristles plumose; phyllaries straight ................................................................................................................ 2. *O. leptolepis*


*大翅蓟 da chi ji*

*Acanos spina* Scopoli, nom. illeg. superfl.

Herbs to 2 m tall. Stem erect, usually branched above, stout, glabrous or cobwebby; wings 2–5 cm wide, with triangular spiny lobes or teeth; spines yellowish brown, to 5 mm. Leaves glabrous or sparsely cobwebby to densely lanate. Basal leaves elliptic to broadly ovate, 10–30 × 4–15 cm, pinnately lobed or with unequal triangular teeth, teeth and lobes ending in yellowish brown spines. Middle and upper cauline leaves sessile, narrowly elliptic to oblanceolate, gradually smaller upward. Capitula solitary. Involucre globose to ovoid, ca. 5 cm in diam., cobwebby, glabrescent. Phyllaries abaxially gland-dotted, margin ciliate; outer and middle phyllaries ovate-subulate to lanceolate-subulate, 1.7–1.8 × 0.4–0.5 cm, leathery, apex narrowed into a pungent divaricate to reflexed spine; inner phyllaries lanceolate to linear, 2–3 × 0.3 cm, straight, apex acuminate-subulate. Corolla purplish red to pink, ca. 2.4 cm, tube ca. 1.2 cm. Achene grayish black to gray, obvoid to narrowly ellipsoid, ca. 6 mm, 3-ribbed, transversely wrinkled, apical rim not prominent. Pappus bristles reddish, to 1.2 cm, scabrid. Fl. and fr. Jun–Sep. 2n = 34.

Mountain slopes, wastelands, by ditches; 400–1200 m. N Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia, Europe].

2. **Onopordum leptolepis** Candolle, Prodr. 6: 619. 1838.

*羽冠大翅蓟 yu guan da chi ji*

Herbs 30–40 cm tall. Stem erect, unbranched or with few branches, densely lanate; wings broad, undulate, densely lanate, with yellow spines. Leaves densely lanate. Lower cauline leaves sessile, narrowly elliptic, 30–40 cm, pinnately lobed; lobes ovate, margin undulate, with spiny teeth. Upper cauline leaves gradually smaller upward, lobed or toothed; teeth and lobes apicately with yellow spines. Capitula solitary. Involucre globose to subglobe, 4–6 cm in diam., lanate pubescent. Outer and middle phyllaries lanceolate, straight, apex accumbent to involucral and narrowed into a slender spine; innermost phyllaries 3–3.5 × ca. 0.2 cm, narrowed into a scarious 1.2–1.5 cm acumen. Achene brown to grayish brown, tetragonous, ca. 6 mm, 4-ribbed, wrinkled along edges, apical rim scarious. Pappus bristles to 2.5 cm, plumose, a single inner one more robust than others and ca. 3 cm. Fl. and fr. May–Jun. 2n = 34.

Mountainous regions. Xinjiang [Kazakhstan].

No material of *Onopordum leptolepis* from China was seen by the present authors. The above description is taken from the treatment by Pavlov (Fl. Kazakhst. 9: 348–350. 1966).


*肋果蓟属 lei guo ji shu*

Shi Zhu (石铸 Shih Chu); Werner Greuter

Herbs, perennial. Stems usually unbranched, unwinged. Cauline leaves undivided, linear-lanceolate or linear, margin entire and revolute between spaced, paired, or digitate spines. Capitula 1 or 2, erect. Involucre campanulate. Phyllaries abaxially gland-dotted, margin ciliate; outer and middle phyllaries ovate-subulate to lanceolate-subulate, 1.7–1.8 × 0.4–0.5 cm, leathery, apex narrowed into a pungent divaricate to reflexed spine; inner phyllaries lanceolate to linear, 2–3 × ca. 0.3 cm, straight, apex acuminate-subulate. Corolla purplish red to pink, ca. 2.4 cm, tube ca. 1.2 cm. Achene grayish black to gray, obvoid to narrowly ellipsoid, ca. 6 mm, 3-ribbed, transversely wrinkled, apical rim not prominent. Pappus bristles reddish, to 1.2 cm, scabrid. Fl. and fr. Jun–Sep. 2n = 34.

Mountainous regions. Xinjiang [Kazakhstan].

No material of *Ancathia igniaria* from China was seen by the present authors. The above description is taken from the treatment by Pavlov (Fl. Kazakhst. 9: 348–350. 1966).


*肋果蓟 lei guo ji*

Herbs 15–20 cm tall, rhizomatous. Rootstock stout,
branched. Stems densely felted. Basal leaves absent at anthesis. Cauline leaves numerous, sessile, 10–20 × 0.5–1 cm, leathery, abaxially grayish white and densely felted, adaxially glabrous and shiny, marginal and apical spines 5–6 mm. involucre 3–5 cm, cobwebby. Outer phyllaries triangular, 7–8 × 1.6–2 mm, apex tipped with a reflexed 2–3 mm spine; middle phyllaries oblongate, 1.5–2.5 cm × 3–4 mm, apically abruptly constricted and tipped with a reflexed to patent 5–6 mm spine; inner phyllaries red, lanceolate, oblanceolate, or linear, 3–3.2 × ca. 0.4 cm, scarios, apex long acuminate. Corolla purple to red, ca. 2.8 cm, tube ca. 1.2 cm. Achene dark brown, ca. 6.5 mm. Pappus bristles whitish. Fl. and fr. Jun–Sep.

Mountain slopes, rocky areas; 1100–1500 m. N Xinjiang [Kazakhstan, Mongolia, Russia].

4. Subtribe CARDUINAE

Herbs, annual to perennial. Capitula homogamous. Phyllaries pointed, ending in a straight or recurved spine; inner phyllaries sometimes with a scarios appendage. Receptacle with dense long bristles. Florets bisexual, rarely unisexual and then plants dioecious. Corolla ± actinomorphic. Stamen filaments distinct, ± pubescent. Style branches coherent for most of their length. Achene glabrous; apical rim forming a smooth-margined upright crown; apical plate with a prominent oleaginous central umbo (elaiosome). Pappus of scabrid or plumose bristles basally connate into a ring and falling off together.

Eleven genera and ca. 380 species: E and N Africa, Asia, Europe; two genera and 49 species (23 endemic) in China.

Cynara scolymus Linnaeus and C. cardunculus Linnaeus, of Mediterranean origin, are cultivated in China for their edible receptacle and phyllaries. Another Mediterranean species, Silybum marianum (Linnaeus) Guertner, is grown as an ornamental and for its achenes, which are used medicinally.


3a. Some of phyllaries expanded laterally into membranous wings or distally into a scarios appendage.

4a. Leaves adaxially rough and spinulose.

5a. Leaves abaxially densely felted; outer and middle phyllaries unwinged but inner phyllaries expanded into a scarios white or pink appendage .......................................................... 37. C. leducii

5b. Leaves abaxially sparsely cobwebby; outer and middle phyllaries with a margin expanded into yellowish scarios wings ............................................................................................................... 44. C. chrysolepis

4b. Leaves adaxially smooth or covered with hair-tipped papillae and slightly rough but not spinulose.

6a. Bracts surrounding capitula with pectinately arranged long pungent spines.

7a. Margin of middle phyllaries not laterally expanded into wings but inner phyllaries apically expanded .............................................................................................. 41. C. argyracanthum

7b. Margin of middle phyllaries expanded into wings.
7b. Margin of middle phyllaries expanded above base into denticulate to lacerate scarious wings.
8a. Outer phyllaries unwinged but usually with pectinately spinulose margin, middle phyllaries
with irregularly lacerate scarious wings ................................................................. 42. C. glabrifolium
8b. Outer and middle phyllaries with regularly denticulate-lacerate wings ................................. 43. C. sieversii
6b. Bracts surrounding capitula (if present) without pectinately arranged long pungent spines.
9a. Leaves green, concolorous, and glabrous or with sparse hairs along veins.
10a. Stems below capitulum felted ................................................................. 33. C. tianmushanicum
10b. Stems with crispate hairs, below capitulum also ± cobwebby ................................ 34. C. chinense
9b. Leaves abaxially grayish white and cobwebby or felted, adaxially green, glabrous, papillose,
or with scattered crispate hairs.
11a. Leaves undivided or rarely slightly lobed in proximal third .......................................... 35. C. lineare
11b. Leaves pinnately lobed to pinnatipartite at least in proximal half ................................. 36. C. shansiense
3b. Phyllaries lacking wings and scarious appendage.
12a. Outer and middle phyllaries villous or hirsute with multicellular hairs or bristles.
13a. Leaves concolorous, greenish, with sparse to dense bristles ............................... 15. C. fascotrichum
13b. Leaves discolorous, abaxially grayish white and densely felted, adaxially green and glabrous .......................... 16. C. muliense
12b. Involucre glabrous, sparsely cobwebby, or lanate, phyllaries never hirsute or villous.
14a. Involucre densely lanate.
15a. Leaves adaxially with scattered spinules or smooth, pinnately divided, segments elliptic,
semiorbicular, or ovate ................................................................. 7. C. eriophoroides
15b. Leaves adaxially rough with sparse to dense spinules, bipinnatipartite, segments triangular
to triangular-lanceolate ................................................................. 12. C. lidjiangense
14b. Involucre glabrous or cobwebby.
16a. Leaves adaxially rough and spinulose.
17a. Stems winged ............................................................................. 14. C. vulgare
17b. Stems unwinged.
18a. Leaf segments elliptic, semiorbicular, or ovate.
19a. Leaves discolorous, abaxially grayish white, adaxially green ........................................ 8. C. subulariforme
19b. Leaves concolorous, green ................................................................. 9. C. veratum
18b. Leaf segments lanceolate to narrowly triangular.
20a. Leaves concolorous, green to yellowish green ................................................................. 10. C. chlorolepis
20b. Leaves discolorous, abaxially grayish white, adaxially greenish.
21a. Outer and middle phyllaries ending in a subulate spine 8–13 mm, outer phyllaries not
much shorter than inner ............................................................................ 11. C. botryodes
21b. Outer phyllaries ending in a spine or acumen to 2 mm, outer phyllaries much shorter
than inner ....................................................................................... 13. C. interpositum
16b. Leaves adaxially smooth and not spinulose.
22a. Corolla yellow or white.
23a. Plants 80–150 cm tall; involucre 4–4.5 cm in diam.; leaves discolorous ..................... 6. C. monocephalum
23b. Plants 45–50 cm tall; involucre ca. 2 cm in diam.; leaves discolorous ...................... 40. C. alberti
22b. Corolla red to purple.
24a. Plants stemless with all leaves basal.
25a. Petiole unwinged or with discontinuous wing; outer and middle phyllaries narrowly triangular,
pectinately fringed with spinules ........................................................................ 4. C. soulieei
25b. Petiole with continuous wing; outer and middle phyllaries ovate to lanceolate, margin not
spinulose ........................................................................................................ 23. C. esculentum
24b. Plants with leafy stems at least 20 cm tall.
26a. Stems winged .................................................................................. 29. C. alatum
26b. Stems unwinged.
27a. Outer phyllaries bractlike, dissimilar from and almost twice as long as middle and inner
phyllaries ................................................................................................. 1. C. bracteiferum
27b. Outer phyllaries not bractlike, similar to and not longer than middle ones.
28a. Outer and middle phyllaries pectinately fringed with spinules.
29a. Leaves abaxially cobwebby or glabrous, adaxially glabrous ........................................ 5. C. fargesii
29b. Leaves not cobwebby but with crispate multicellular hairs.
30a. Involucre ca. 4 cm in diam., sparsely cobwebby ...................................................... 2. C. leo
30b. Involucre ca. 2 cm in diam., glabrous ....................................................................... 3. C. henryi
28b. Outer and middle phyllaries not fringed with spinules.
31a. Bracts surrounding capitula reduced to pectinately arranged long pungent spines.

刺盖草 ci gai cao

Herbs to 40 cm tall, perennial. Stems erect, branched above, unwinged, with long multicellular hairs and apically also cobwebby. Leaves concolorous, surface smooth but with sparse multicellular hairs. Upper cauline leaves sessile, elliptic, ca. 13 × 4 cm, pinnatipartite, semiamplexicaul; segments 6 or 7 pairs, obliquely triangular, margin sparsely spinose or with teeth tipped with a 3–6 mm spine. Bracts similar to leaves but smaller. Pedicels stout, with dense multicellular hairs. Capitula several, racemose. Involucre broadly campanulate, 3–4.5 cm in diam., glabrous. Phyllaries in ca. 6 rows, lacking wings and scarious appendage; outer phyllaries bractlike, 3.5–4 × 0.3–0.5 cm, margin minutely toothed and spiny, basal portion elliptic to lanceolate, apical portion subulate and narrowed into a long spine; middle and inner phyllaries markedly different, elliptic to broadly linear, ca. 2.1 × 0.2–0.4 cm, apex acute. Florets bisexual. Corolla purplish red, ca. 2.1 cm, tube ca. 1 cm. Mature achene unknown. Fl. Jul.

- Slopes; ca. 1500 m. Chongqing (Nanchuan).


魁蓟 kui ji

Cirsium chienii C. C. Chang; C. pinnatibracteatum Y. Ling.

Herbs 40–100 cm, perennial. Stems simple or tufted, erect, branched above or rarely unbranched, ribbed, unwinged, with long crispate multicellular hairs. Leaves concolorous, green, surface smooth and not cobwebby but with crispate multicellular hairs dense abaxially along veins but scattered elsewhere. Basal and lower cauline leaves with petiolar to 5 cm; leaf blade elliptic to oblongelliptic-elliptic, 10–25 × 4–7 cm, pinnatipartite; segments 8–12 pairs, semioblong, narrowly elliptic, or obliquely triangular, with unequal triangular teeth laterally spiny and with an apical (3–)5–6(–12) mm spine. Middle and upper cauline leaves similar but sessile and gradually smaller upward. Capitula corymbose. Involucre campanulate, ca. 4 cm in diam., sparsely cobwebby. Phyllaries in ca. 8 rows, lacking wings and scarious appendage, all of similar length; outer and middle phyllaries 2–3 × 0.2–0.3 cm, pectinately fringed with spinules.
to 2.5 mm, basal portion triangular to lanceolate, apical portion subulate tipped with a ca. 3 mm spine; inner phyllaries lanceolate to linear, ca. $2 \times 0.1$–$0.2$ cm, apex long acuminate. Florets bisexual. Corolla purplish red, ca. $2.4$ cm, tube ca. $1$ cm. Achene dark gray, ca. $5$ mm. Pappus bristles dirty white, ca. $2.2$ cm. Fl. and fr. May–Sep.

- Mountain valleys, slopes, forest margins, flooded lands, rock crevices, along streams, wet places; 700–3400 m. Gansu, Hebei, Henan, Ningxia, Shaanxi, Shanxi, Sichuan.


刺苞蓟  ci bao ji

*Cnicus henryi* Franchet, J. Bot. (Morot) 11: 21. 1897; *Cirsium forrestii* (Diels) H. Léveillé; *C. melanoepis* Petrak; *C. taliense* (Jeffrey) H. Léveillé; *Cnicus forrestii* Diels; *C. taliensis* Jeffrey.

Herbs 30–50 cm tall, perennial. Stems erect, branched above, rarely unbranched, unwinged, with brown multicellular hairs. Leaves concolorous, surface green to pale green, smooth, and not cobwebby but with ± dense crispate multicellular hairs. Basal and lower cauline leaves petiolate; leaf blade lanceolate, oblancoate, or ± narrowly elliptic, $10$–$18 \times 4$–$8$ cm, pinnately divided; segments 5–8 pairs, elliptic, lanceolate, or triangular, with unequal triangular teeth laterally spiny and with an apical (2–6)–7 mm spine; terminal segment largest. Middle and upper cauline leaves similar but sessile and gradually smaller upward. Bracts entire, ± broadly linear, margin spiny. Capitula corymbose or paniculate, ± nodding. Involucres campanulate, ca. $2$ cm in diam., glabrous. Phyllaries in ca. 6 rows, lacking wings and scarious appendage, all of similar length, 11–14 × 1.5–2 mm, pectinately fringed with geminate 2.5–3 mm spinules, apex narrowed into a spine; inner phyllaries triangular to lanceolate, $13$–$14 \times 2$ mm, not spinulose. Florets bisexual. Corolla purple. Corolla purple, ca. $1.6$ cm, tube ca. $1$ cm. Achene brownish, ca. $4$ mm. Pappus bristles brownish, to $1.5$ cm. Fl. and fr. Jun–Oct.

- Meadows; 2700–3500 m. W Hubei, Sichuan, Yunnan.


葵花大蓟  kui hua da ji


Herbs, stemless, perennial. All leaves basa1, rosulate, petiolate, concolorous, green, smooth, with long multicellular hairs particularly along veins; petiole 1.5–4 cm, unwinged or with discontinuous wing; leaf blade ± narrowly elliptic, elliptic-lanceolate, or oblancoate, 8–21 × 2–6 cm, pinnately lobed to pinnatifid; segments 7–11 pairs, ovate-lanceolate, elliptic, or broadly triangular, toothed; teeth with a 2–5 mm apical spine or spine; terminal segment largest. Peduncles short. Capitula few to many, clustered in center of rosette. Involucres campanulate, 3–5 cm in diam., glabrous. Phyllaries in 3–5 rows, lacking wings and scarious appendage, all of similar length; outer and middle phyllaries narrowly triangular, 1.8–2.3 × 0.1–0.2 cm, pectinately fringed with 2–3 mm spinules, tipped with a slender ca. 5 mm spine; inner phyllaries ca. 2.5 × 0.2 cm, not spinulose. Florets bisexual. Corolla purplish red, ca. $2.3$ cm, tube ca. $1.8$ cm. Achene dark, ca. $5$ mm. Pappus bristles dirty white to brownish, to $2$ cm. Fl. and fr. Jul–Sep.

Forest margins, roadssides, fallow fields, flooded lands, fields, moist places by water; 1900–4800 m. Gansu, S Ningxia, Qinghai, Sichuan, Xizang [India (Sikkim)].


等苞蓟 deng bao ji

*Cnicus fargesii* Franchet, J. Bot. (Morot) 11: 22. 1897.

Herbs to 1 m tall, perennial. Stems erect, sparingly branched above, ribbed, unwinged, sparsely cobwebby and with long multicellular hairs. Leaves smooth on both faces, abaxially green or grayish white and glabrous or sparsely cobwebby-felted, adaxially green and glabrous. Lower to middle cauline leaves petiolate; leaf blade broadly lanceolate to lanceolate, 20–30 × 7–8 cm, pinnatifid; segments 6 pairs, elliptic to ± broadly triangular, teeth laterally shortly spiny and with an apical spine to $1$ cm; terminal segment narrowly lanceolate, margin spiny. Middle and upper cauline leaves similar but sessile, semiamplexicaul. Capitula few, corymbose. Involucres broadly campanulate, ca. $4$ cm in diam., ± cobwebby. Phyllaries in ca. 4 rows, lacking wings and scarious appendage, all of similar length; outer and middle phyllaries 2.1–2.4 × 0.3 cm, pectinately fringed with ca. $2$ mm spinules, basal portion linear to triangular, apical portion subulate, patent to slightly recurved, and tipped with a brown spine; inner phyllaries linear, ca. $2.1$ × 0.2 cm, with an apical spine. Florets bisexual. Corolla purplish red, ca. $2.2$ cm, tube ca. $1$ cm. Mature achene unknown. Pappus bristles to $2$ cm. Fl. Jul.


马刺蓟 ma ci ji


Herbs 0.8–1.5 m tall, perennial. Stems erect, branched above, ribbed, unwinged, sparsely cobwebby and with long multicellular hairs. Leaves concolorous, green, surface smooth and glabrous or with sparse long multicellular hairs. Middle cauline leaves sessile, ± narrowly elliptic to lanceolate, $15$–$25 \times 5$–$9$ cm, pinnatifid; segments 5–10 pairs, ± narrowly lanceolate to triangular, margin spiny or with teeth tipped with a 3–10 mm spine. Upper cauline leaves similar but smaller. Capitula few, corymbose to paniculate. Involucres broadly campanulate to hemispheric, 4–4.5 cm in diam., sparsely cobwebby. Phyllaries in ca. 8 rows, 2.2–3.5 × 0.3–0.4 cm, all of similar length, lacking wings and scarious appendage, basal portion linear, apical portion subulate, patent to reflexed, and narrowed into a
long spine. Florets bisexual. Corolla white or yellowish, ca. 1.4 cm, tube ca. 7 mm. Achene brown, ca. 3.5 mm. Pappus bristles to 1.7 cm. Fl. and fr. Jul–Oct.

- Mountain valleys, forest margins, forests, thickets, wastelands; 700–2000 m. Chongqing, S Gansu, Guizhou, SW Hubei, S Shaanxi (Qin Ling), S Shanxi, Sichuan.


\(\text{貢山蓟 gong shan ji}\)

*Cnicus eriophoroides* J. D. Hooker, Fl. Brit. India 3: 363. 1881; *Cirsium holoccephalum* Petrak; *C. holoccephalum var. racemosum* Petrak; *C. holoccephalum subsp. setschwanicum* Petrak.

Herbs 1–3 m tall, perennial. Stems erect, branched above, unwinged, sparsely cobwebby and with long multicellular hairs. Leaves papery, concolorous, green, abaxially glabrous or sparsely cobwebby and with multicellular hairs, adaxially with sparse 3–8 mm spinules and spines but sometimes almost completely smooth. Lower and middle cauline leaves petiolate; leaf blade elliptic, 20–35 × 8–15 cm, toothed or pinnately divided; segments when present 4–8 pairs, elliptic, semilobar, or ovate, with 2–5 spines or teeth laterally shortly spiny and with a 0.5–1.5 cm apical spine. Upper cauli ne leaves similar but sessile. Capitula few, corymbose, nodding to erect. Involucre globose, ca. 5 cm in diam., densely and fluffily lanate. Phyllaries in ca. 6 rows, all of similar length or inner somewhat longer, lacking wings and scarious appendage; outer and middle phyllaries 2–3 × 0.2–0.4 cm, basal portion lanceolate to triangular, apical portion subulate and 1.5–2 cm; inner phyllaries ca. 3.5 × 0.2–0.3 cm, basal portion linear-lanceolate to linear, apical portion subulate and ca. 1.5 cm. Florets bisexual. Corolla purple, ca. 3.5 cm, tube ca. 2.2 cm. Achene dark brown, ca. 5 mm. Pappus bristles ca. 2.5 cm. Fl. and fr. Jul–Oct.

Slopes, thickets, thicket margins, grasslands, meadows, flooded lands, by water; 2000–4100 m. SW Sichuan, SE Xizang, Yunnan [Bhutan, India (Sikkim)].


\(\text{钻苞蓟 zuan bao ji}\)


Herbs 1.5–2 m tall, perennial. Stems erect, ribbed, unwinged, sparsely cobwebby, often densely cobwebby below capitula. Leaves papery, discolorous, abaxially grayish white and densely felted, adaxially green to yellowish green, very rough, and covered with dense 1–3 mm spinules and scattered 4–11 mm spinules. Lower cauli ne leaves with winged petiole to 14 cm, wing undulate to dissected into semilobar segments and with 1–1.5 cm spines or spine-tipped teeth; leaf blade elliptic, ca. 33 × 18 cm, pinnatifid; segments 7 or 8 pairs, elliptic, with 3–5 unequal triangular teeth fringed with ca. 1 mm spinules and with a ca. 1 cm apical spine. Middle and upper cauli ne leaves sessile, narrowly elliptic to lanceolate, gradually smaller upward, semiamplexicaul, margin entire or toothed and with 5–10 mm spines. Bracts reduced to spines. Capitula corymbose to racemose. Involucre campanulate, 3–4 cm in diam., glabrous. Phyllaries in ca. 7 rows, ca. 18 × 1.5–2 mm, all of similar length or somewhat longer inwardly, lacking wings and scarious appendage, basal portion linear, lanceolate, or elliptic, apical portion subulate and 3–10 mm. Florets bisexual. Corolla purple, ca. 3 cm, tube ca. 1.9 cm. Achene ca. 5 mm. Pappus bristles brownish to dirty white, ca. 1.8 cm. Fl. and fr. Jul–Aug.

- Grasslands on mountain slopes, thickets in river valleys, forests; 1500–2500 m. SE Xizang, NW Yunnan.


\(\text{苞叶蓟 bao ye ji}\)

*Cnicus verutus* D. Don, Prodr. Fl. Nepal. 167. 1825; *Cirsium involucratum* Candolle, nom. illeg. superfl.

Herbs 1–1.5 m tall, perennial. Stems erect, branched, unwinged, with long multicellular hairs. Leaves concolorous, green, abaxially glabrous or sparsely cobwebby and with long multicellular hairs, adaxially rough and sparsely to densely spinulose. Middle cauli ne leaves sessile, oblanceolate, 15–20 × 3–9 cm, pinnatifid, semiamplexicaul; segments ca. 10 pairs, ovate to elliptic, with unequal triangular teeth with 1–2 mm lateral spinules and a 3–5 mm apical spine, basal teeth sometimes spiniform. Upper cauline leaves similar but ovate to narrowly elliptic, segments or teeth with a 5–10 mm apical spine. Bracts ovate, margin spiny or with spiny teeth. Capitula corymbose. Involucre campanulate, 3–3.5 cm in diam., glabrous or sparsely cobwebby. Phyllaries imbricate, in ca. 7 rows, lacking wings and scarious appendage; outer and middle phyllaries 1.2–2.5 × 0.2–0.3 cm, basal portion triangular to lanceolate, apical portion subulate, 1–1.2 cm, and patent to reflexed; inner phyllaries linear-lanceolate, ca. 2.5 × 0.2 cm, apex long acuminate. Florets bisexual. Corolla reddish purple, ca. 2.8 cm, tube ca. 1.5 cm. Achene dark, ca. 3.5 mm. Pappus bristles brownish, to 2 cm. Fl. and fr. Jul–Sep.

Slopes, forests, forest margins; 2900–3900 m. Xizang [Afghanistan, Bhutan, India, Nepal, Pakistan, Vietnam].


\(\text{两面蓟 liang mian ji}\)

Herbs 30–100 cm tall, perennial. Stems erect, branched above, unwinged, with dense long multicellular hairs and sparsely cobwebby, densely cobwebby-felted above. Leaves concolorous, green to yellowish green, abaxially sparsely covered with spinules less than 1 mm, adaxially rough and densely covered with 1–2 mm spinules. Lower and middle leaves sessile, lanceolate, oblanceolate, or elliptic, 16–20 × 6–8 cm, pinnately divided, amplexicaul; segments 5–8 pairs, triangular-lanceolate to ± narrowly triangular, fringed with spinules, with a 5–7 mm apical spine; terminal segment largest. Upper cauli ne leaves similar but smaller. Capitula racemose or corymbose, ± nodding. Involucre broadly campanulate, 3.5–4 cm in diam., glabrous or sparsely cobwebby. Phyllaries in 7 or 8 rows, 1.3–2.3 × 0.3–0.5 cm, all of similar length, lacking wings and
scariosous appendage, basal portion lanceolate, apical portion subulate, 6–10 mm, and patent to recurved. Florets bisexual. Corolla purplish red, ca. 2 cm, tube ca. 1 cm. Achene yellowish, cuneate-oblancoate, ca. 4 mm. Pappus bristles brownish. Fl. and fr. Jul–Oct.

- Forests, grasslands on mountain slopes; 1300–1800 m. SW Guizhou, Yunnan.


灰蓟 hui ji

*Cirsium griseum* H. Léveillé (1913), not (Rydberg) Cock-erell (1911); *C. heliophilum* Petrak; *C. mairei* (H. Léveillé) H. Léveillé (1913), not Halácsy (1908); *C. yunnanense* Petrak; *Cnicus mairei* H. Léveillé.

Herbs 50–100 cm tall, perennial. Stems grayish white, erect, usually branched, unwinged, with dense long multicellular hairs and cobwebby, densely felted below capitula. Leaves rigid, discolorous, abaxially grayish white and densely felted, adaxially greenish, rough, and densely spinulose. Lower to upper cauline leaves sessile, lanceolate to ovate-lanceolate, 12–16 × 6.5–8 cm, pinnately divided, semiamplexicaul; segments ca. 4 pairs, narrowly triangular to lanceolate, basally on one or both sides with a triangular tooth with 1–1.5 mm lateral spinules and a 3–7 mm apical spine, apex narrowed into a 5–7 mm spine. Bracts reduced to spines. Capitula racemose to racemose-corymbose. Involute broadly campanulate, ca. 3.5 cm in diam., sparsely cobwebby. Phyllaries in ca. 7 rows, lacking wings and scarious appendage; outer phyllaries not much shorter than inner ones; outer and middle phyllaries 10–20 × 3–4 mm, basal portion ovate to elliptic, apical portion subulate and ending in a 0.8–1.3 cm spine; inner phyllaries lanceolate-subulate to linear, ca. 2.5 × 0.1–0.2 cm. Florets bisexual. Corolla white, ca. 2 cm, tube ca. 9 mm. Achene ca. 5 mm. Pappus bristles brownish, to 2 cm. Fl. and fr. May–Sep.

- Mountain valleys, grasslands on mountain slopes; 2800–3000 m. W Guizhou, W Hunan, S Sichuan, Yunnan.


丽江蓟 li jiang ji

Herbs 70–120 cm tall, perennial. Stems erect, ribbed, branched above, unwinged, cobwebby to hisrate below, densely cobwebby above. Leaves discolorous, abaxially grayish white and densely felted, adaxially green and rough with sparse to dense 0.3–1 mm spinules. Lower cauleine leaves sessile, elliptic, 50–60 × 18–24 cm, bipinnatipartite, semiamplexicaul; primary segments 10 or 11 pairs; secondary segments 1 or 2 pairs, triangular to triangular-lanceolate, basally with 1 triangular, spine-tipped tooth; terminal lobe narrowly lanceolate, with 1 or 2 marginal spines and a 4–12 mm apical spine. Middle and upper cauline leaves similar but gradually smaller upward, with ± equally forked primary segments; secondary segments lanceolate. Capitula racemose to racemose-paniculate, nodding. Involute globose, 4–5 cm in diam., densely lanate. Phyllaries in ca. 7 rows, lacking wings and scarious appendage; outer phyllaries not much shorter than inner ones; outer and middle phyllaries 2.2–2.5 × 0.4–0.5 cm, apical portion triangular, lanceolate, or elliptic, apical portion subulate and with a 1–1.2 cm terminal spine; inner phyllaries linear-subulate, ca. 3.8 × 0.3 cm. Florets bisexual. Corolla reddish purple, ca. 2.2 cm, tube ca. 1.9 cm. Achene brown, ca. 5 mm. Pappus bristles brownish, ca. 2 cm. Fl. and fr. Jul–Oct.

- Meadows; 1800–3200 m. SW Sichuan, NW Yunnan.


披裂蓟 pi lie ji

*Cnicus griffithii* J. D. Hooker (1881), not *Cirsium griffithii* Boissier (1875).

Herbs 2–2.5 m tall, perennial. Stems erect, stout, branched in upper half, ribbed, unwinged, sparsely cobwebby. Leaves discolorous, abaxially grayish white and densely felted, adaxially green, rough, and sparsely to densely spinulose. Middle cauleine leaves sessile, ± narrowly elliptic, ca. 60 × 25 cm, pinnately divided, semiamplexicaul with auricles bearing 2–4 cm spines; segments 9–11 pairs, ± narrowly lanceolate, basally on both sides with 1 or 2 spiny teeth, fringed with 1–3 mm spinules, apex narrowed into a 1.5–2.5 cm spine. Upper cauleine leaves similar but gradually smaller upward. Bracts lanceolate to linear, smaller than upper leaves, fringed with 2–2.5 cm spines. Capitula corymbose, ± nodding. Involute broadly campanulate, 4–4.5 cm in diam., sparsely cobwebby, glabrescent. Phyllaries in ca. 10 rows, lacking wings and scarious appendage, outer phyllaries much shorter than inner ones; outer phyllaries triangular to lanceolate, 8–10 × 2.5–3 mm, apex narrowed into a 0.5–2 mm acumen or spinule; middle and inner phyllaries lanceolate to linear, 1.5–3 × 0.2–0.3 cm, apex acuminate and scarious. Florets bisexual. Corolla purple, ca. 3.5 cm, tube ca. 2.5 cm. Achene dark, ca. 5 mm. Pappus bristles brownish, ca. 2.5 cm. Fl. and fr. Sep–Nov.

- Forests, open forests, grasslands on mountain slopes; 2000–2500 m. SE Xizang, W Yunnan.


翼蓟 yi ji

*Cardinus vulgarg* Savi, Fl. Pis. 2: 241, 1798; *C. lanceolatus* Linnaeus; *Cirsium lanceolatum* (Linnaeus) Scopoli (1772), not Hill (1769); *Eriolepis lanceolata* (Linnaeus) Cassini.

Herbs 25–150 cm tall, biennial. Stems grayish white, erect, branched above, winged, with sparse long multicellular hairs and cobwebby, densely felted above; wings toothed, teeth ending in a long spine. Leaves herbaceous, discolorous, abaxially grayish white and densely felted, adaxially green to yellowish green, rough and densely covered with ca. 1.5 mm spinules. Middle cauleine leaves sessile, linear-lanceolate, lanceolate, or oblancoate, 10–15 × 4–5 cm, bipinnatipartite; primary segments 3 or 4 pairs, equally or unequally forked; secondary segments triangular to lanceolate, fringed with spinules, apex with a 5–10 mm spine; terminal lobe lanceolate, fringed...
with spinules and a few spines 5–10 mm. Upper cauline leaves similar but gradually smaller upward. Bracts linear, margin with long spines. Capitula few to many, paniculate-corymbose to racemose, erect. Involucre ovoid, 3–5 cm in diam., glabrous. Phyllaries imbricate, in 10 rows, lacking wings and scarious appendage; outer and middle phyllaries 0.8–3 × 0.2–0.4 cm, basal portion triangular, lanceolate, or linear, apical portion subulate, 5–9 mm, and narrowed into a spine; inner phyllaries linear, ca. 3.4 × 0.3 cm, apex acuminate. Florets bisexual. Corolla red, ca. 3 mm, tube filiform, ca. 2 cm. Achene brown, ca. 4 mm. Pappus bristles white, to 3 cm. Fl. and fr. Jul–Aug. 2n = 34, 68.

Farmlands, wet grasslands; 400–1800 m. N Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Turkmenistan; N Africa, SW Asia, Europe].

*Cirsium vulgare* is a noxious weed that is naturalized in many parts of the world.


*褐毛蓟 he mao ji*

Herbs ca. 90 cm tall, perennial. Stems ribbed, unbranched, ± densely brownish hirsute. Leaves concolorous, greenish, abaxially with short brown bristles along veins but otherwise glabrous, adaxially sparsely to densely bristly and rough. Lower cauleine leaves sessile, oblanceolate, ca. 22 × 9 cm, pinnatifid; segments ca. 7 pairs, subtriangular, often 1- or 2-lobulate near base, fringed with spinules, apex with a long spine. Middle and upper cauleine leaves similar but smaller, base amplexicaul. Capitula few, corymbose. Involucre hemispheric, ca. 6 cm in diam., hirsute. Phyllaries in ca. 4 rows, 3.4 × 0.1–0.2 cm, lacking wings and scarious appendage, abaxially brownish hirsute with dense long rigid bristles, basal portion lanceolate to linear, apical portion subulate. Corolla not seen. Achene brownish, ca. 4 mm, with 1 stria on each side. Pappus bristles brownish, ca. 1.4 cm. Fl. and fr. Aug.

- Slopes; ca. 2500 m. Sichuan (Pingwu).


*木里蓟 mu li ji*

Herbs 25–100 cm tall, perennial. Stems grayish white, erect, unbranched, ribbed, unwinged, long villous; synflorescence axes densely felted. Leaves discolored, surface smooth, abaxially grayish white and densely felted, adaxially green and glabrous. Cauleine leaves sessile, elliptic, 6–7 × 1.5–2 cm, pinnatifid, auriculate amplexicaul; segments 3 or 4 pairs, broadly triangular to semiorbicular, fringed with 1–2 mm spinules and with 3–5 unequal triangular teeth ending in a 4–6 mm spine. Upper cauleine leaves usually undivided, margin spiny or with spine-tipped teeth, spines to 1.4 cm. Capitula few, racemose, erect. Involucre campanulate, ca. 5 cm in diam., villous. Phyllaries in ca. 6 rows, lacking wings and scarious appendage, abaxially villous with dense long multicellular hairs; outer phyllaries 15–16 × 1.2 mm, basal portion triangular, apical portion subulate, 0.9–1.1 cm, and spine-tipped; middle phyllaries 1.6–1.9 × 0.2–0.3 cm, basal portion lanceolate, apical portion subulate and 4–11 mm; inner phyllaries linear, ca. 17 × 1 mm, apex acuminate and scarious. Florets bisexual. Corolla red, ca. 1.4 cm, tube ca. 6 mm. Mature achene unknown. Pappus bristles white, ca. 1.2 cm. Fl. Nov.

- Dry mountain slopes; ca. 3200 m. SW Sichuan (Muli).


*块蓟 kuai ji*


Herbs 30–40 cm tall, perennial. Stems erect, unbranched or little branched, ribbed, unwinged, with sparse long bristles, also cobwebby above. Leaves undivided, concolorous, green, surface smooth, glabrous or with multicellular hairs. Lower cauleine leaves sessile and semiamplexicaul or narrowed into a petiole to 2.5 cm; leaf blade elliptic to lanceolate, 7–8 × 1.5–2 cm, margin fringed with 1–2 mm spinules, apex acute and spine-tipped. Middle and upper cauleine leaves similar but gradually smaller upward. Capitula 1 to few. Involucre campanulate, 1.5–2 cm in diam., glabrous or sparsely cobwebby. Phyllaries imbricate, in 7 rows, lacking marginal spinules, wings, and scarious appendage, all or only inner phyllaries abaxially with a resinous gland; outer and middle phyllaries triangular to lanceolate, 3–10 × 1–2 mm, apex acute and tipped with an acumen less than 0.5 mm; inner phyllaries elliptic to linear-lanceolate, 12–15 × 1.5–2 mm, apex acuminate and scarious. Florets bisexual. Corolla purple, ca. 1.9 cm, tube ca. 9 mm. Achene brown, 3.5–4 mm, ribbed. Pappus bristles brownish, ca. 1.5 cm. Fl. and fr. Aug–Sep.

- Moist places, streamsides, roadsides, slopes; 200–2000 m. Hebei, Jilin, Nei Mongol.


*麻花头蓟 ma hua tou ji*

*Carthusia serrulataeoides* Linnaeus, Sp. Pl. 2: 825. 1753; *Cirsium asiaticum* Schischkin; *Cnicus serrulataeoides* (Linnaeus) Roth.

Herbs to 1.2 m tall, perennial. Stem solitary, erect, branched above, ribbed, unwinged, with sparse long multicellular hairs; synflorescence branches usually sparsely cobwebby. Leaves undivided, concolorous, green, surface smooth but with long multicellular hairs. Middle cauleine leaves sessile, lanceolate, 10–15 × 1.5–3 cm, auriculate semiamplexicaul, fringed with spinules less than 0.5 mm, apex acute. Upper cauleine leaves similar but narrower and gradually smaller upward. Capitula erect, laxly corymbose. Involucre ovoid, 1.5–2 cm in diam., glabrous or sparsely cobwebby. Phyllaries imbricate, in 7 rows, lacking marginal spinules, wings, and scarious appendage, abaxially glabrous; outer phyllaries triangular, ca. 6 × 1.2 mm, apex acuminate and tipped with a ca. 1 mm spinu-
lose acumen; middle phyllaries ovate-lanceolate to lanceolate, ca. 7 × 2–2.2 mm, tipped with an acumen less than 0.5 mm; inner phyllaries lanceolate to linear-lanceolate, 8–15 × 1.5–2 mm, apex acuminate and scarious. Florets bisexual. Corolla purplish red, ca. 2 cm, tube ca. 1 cm. Achene brownish, ca. 4 mm. Pappus bristles white, ca. 1.5 cm. Fl. and fr. Jul.–Oct. 2n = 34.

Forests on mountain slopes, by rivers, by water; 1200–2600 m. Xinjiang (Altay Shan) [Mongolia, Russia].


绒背蓟 rong bei ji

_Cirsium vlassovianum_ (Fischer ex Candolle) Maximowicz.

Herbs 25–90 cm tall, perennial. Roots tuberous. Stems erect, unbranched or branched above, ribbed, unwinged, with sparse long multicellular hairs apically mixed with sparse felt. Leaves discolorous, surface smooth, abaxially white and densely felted, adaxially green and with sparse multicellular hairs. Lower cauleine leaves petiolate; leaf blade lanceolate to elliptic-lanceolate, 6–20 × 2–3 cm, undivided, fringed with ca. 1 mm spinules, apex obtuse to acuminate. Middle and upper cauleine leaves similar but auriculate semiamplexicaul. Capitula 1 to few, corymbose, erect. Involucre narrowly ovoid, ca. 2 cm in diam., glabrous or sparsely cobwebby. Phyllaries imbricate, in ca. 7 rows, lacking marginal spinules, wings, and scarious appendage, abaxially with a dark resinous gland; outer and middle phyllaries triangular to lanceolate, 5–11 × ca. 2 mm, apex acute and tipped with a spine less than 1 mm; inner phyllaries broadly linear, ca. 2 × 0.2 cm, apex acuminate and scarious. Florets bisexual. Corolla purple, ca. 1.7 cm, tube ca. 7 mm. Achene brownish s_strerror with brown, ca. 4 mm. Pappus bristles ca. 1.5 cm. Fl. and fr. May–Sep. 2n = 28, 34.

Forests, forest margins, by rivers, moist places; 300–1500 m. Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Shanxi [Korea, Mongolia, Russia].


梵净蓟 fan jing ji

Herbs to 1 m tall, ?perennial. Stems erect, sparingly branched above, unribbed, subglabrous. Leaves concolorous, green, surface smooth and glabrous. Upper cauleine leaves sessile, ovate-elliptic, broadly elliptic, or obovate, 8–16 × 5–9 cm, undivided, auriculate semiamplexicaul, fringed with 0.5–2 mm spinules and with simple or double teeth, apex acute to obtuse and spine-tipped. Bracts sessile, narrowly elliptic to lanceolate, base auriculate semiamplexicaul. Capitula few, terminal on long branches. Involucral broadly campanulate, 2–2.5 cm in diam., glabrous or sparsely cobwebby. Phyllaries imbricate, in ca. 6 rows, lacking an abaxial resinous gland, marginal spinules, wings, and scarious appendage; outer and middle phyllaries ovate-lanceolate, elliptic, or lanceolate, 12–17 × 2–3.5 mm, apex acuminate and tipped with a short spine; inner phyllaries broadly linear, ca. 15 × 1.8 mm, apex acuminate and scarious. Florets bisexual. Corolla purplish, ca. 1.8 cm, tube ca. 8 mm. Mature achene unknown. Pappus bristles dirty white, ca. 1.3 cm. Fl. Jul.

- Grasslands, mountain slopes. Guizhou (Fanjing Shan).


堆心蓟 dui xin ji

_Carduus helenioides_ Linnaeus, Sp. Pl. 2: 825. 1753; _Cirsium heterophylloides_ Pavlov (1938), not Treuinfels (1875); _Cnicus helenioides_ (Linnaeus) Retzius.

Herbs 0.4–2 m tall, perennial. Stems erect, branched above, ribbed, unwinged, sparsely cobwebby. Leaves discolorous, surface smooth, abaxially grayish white and densely felted, adaxially green and with multicellular hairs. Basal leaves present at anthesis, long petiolar. Lower and middle cauline leaves sessile, ± narrowly elliptic or lanceolate, 10–30 × 4–6 cm, undivided, semiamplexicaul, margin with numerous obliquely triangular teeth tipped by a 0.5–1 mm spine and smaller regular spinules in sinuses. Upper cauleine leaves similar but gradually smaller upward. Capitula 1 to few, corymbose, erect. Involucre campanulate, ca. 2.5 cm in diam., glabrous or subglabrous. Phyllaries imbricate, in ca. 6 rows, lacking marginal spinules, wings, and scarious appendage; outer and middle phyllaries triangular to lanceolate-elliptic, 6–10 × 1.5–2 mm, apex acute and tipped with a spine less than 0.2 mm; inner phyllaries elliptic to linear-elliptic, 13–15 × 2–2.5 mm, apex acuminate and scarious. Florets bisexual. Corolla red, ca. 2 cm in diam., glabrous or subglabrous. Phyllaries imbricate, in ca. 6 rows, lacking marginal spinules, wings, and scarious appendage; outer and middle phyllaries triangular to lanceolate-elliptic, 6–10 × 1.5–2 mm, apex acute and tipped with a spine less than 0.2 mm; inner phyllaries elliptic to linear-elliptic, 13–15 × 2–2.5 mm, apex acuminate and scarious. Florets bisexual. Corolla red, ca. 2 cm, tube ca. 8 mm. Achene yellowish, ca. 4.5 mm. Pappus bristles white or dirty white, ca. 2 cm. Fl. and fr. Sep. 2n = 34.

Moist grasslands in mountain valleys, forests, forest margins; 1700–2300 m. N Xinjiang (Burqin) [Kazakhstan, Russia].

22. Cirsium japonicum Candolle, Prodr. 6: 640. 1838.

蓟 ji


Herbs 30–80 (–150) cm tall, perennial. Roots tuberous, fusiform. Stems grayish white, erect, unbranched or branched above, ribbed, unwinged, with sparse to dense long multicellular hairs mixed with dense felt under capitula. Leaves concolorous, green, with sparse multicellular hairs along veins or glabrous, surface smooth. Basal leaves present at anthesis, with winged petiole, wing spiny or with spiny teeth; leaf blade ovate, obovate, or ± narrowly elliptic, 8–20 × 2.5–8 cm, pinnately divided; segments 6–12 pairs, ovate-lanceolate, elliptic, ± narrowly triangular, or triangular-lanceolate, toothed, teeth with marginal and 2–6 mm apical spines; terminal segment largest, lanceolate to narrowly triangular. Lower and middle cauline
leaves similar but sessile, gradually smaller upward, semiamplexicaul. Capitula solitary or few, clustered at end of stem, erect or rarely nodding. Involucrce campanulate, ca. 3 cm in diam., glabrous or sparsely cobwebby. Phyllaries imbricate, in ca. 6 rows, lacking marginal spinules, wings, and scarious appendage; abaxially with a dark resinous gland; outer and middle phyllaries triangular to narrowly triangular, 8–13 × 3–3.5 mm, narrowed into a 1–2 mm spine; inner phyllaries lanceolate to linear-lanceolate, 1.5–2 × 0.2–0.3 cm, apex acuminately and softly spiny. Florets bisexual. Corolla red to purple, ca. 2.1 cm, tube ca. 9 mm. Achene ca. 4 mm. Pappus bristles pale brown, ca. 2 cm. Fl. and fr. Apr–Nov.

Forests, forest margins, thickets, grasslands, wastelands, farmlands, roadsides, streambeds; 400–2100 m. Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Hunan, S Jiangsu, Jiangxi, Nei Mongol, Sichuan, Taiyuan, Yunnan, Zhejiang [Japan, Korea, Russia (Far East), Vietnam].


莲座蓟 莲座蓟 莲座蓟

Herbs 40–70 cm tall, perennial. Stems erect, branched or unbranched, unwinged, with multicellular hairs and densely felted above. Leaves with smooth surface, concolorous with crispate hairs along veins or ± discolorous, abaxially grayish green and cobwebby. Basal and lower cauline leaves often concolorous, with winged petiole, wing spiny or with triangular spine-tipped teeth; leaf blade elliptic to lanceolate, 15–30 × 7–9 cm, pinnately divided; segments 4–8 pairs, elliptic, with unequal triangular teeth; teeth with 4–14 mm lateral spines and apical spine. Capitula many, corymbose, surrounded by pectinately spiny bracts with pungent 2–3 cm spines. Involucrce campanulate, ca. 2 cm in diam., glabrous. Phyllaries imbricate, in ca. 5 rows, lanceolate to elliptic-lanceolate, 8–12 × ca. 3 mm, lacking marginal spinules, wings, and scarious appendage, apex narrowed into a 1–5 mm spine. Florets bisexual. Corolla red, ca. 1.5 cm, tube ca. 6 mm. Achene brown, ca. 4 mm. Pappus bristles brownish, ca. 1.5 cm. Fl. and fr. Jul–Sep.

River valleys, grasslands on mountain slopes, roadsides; 2400–2600 m. Sichuan.


野蓟 野蓟 野蓟

Cirsium asperum Nakai; C. japonicum Candolle var. amurense Kitamura; C. japonicum subsp. maackii (Maximowicz) Nakai; C. japonicum var. maackii (Maximowicz) Matsunura; C. japonicum var. ussuriense (Regel) Kitamura; C. littorale Maximowicz var. ussuriense Regel; C. maackii var. koreiensis (Nakai) Nakai; Cnicus japonicus Maximowicz var. maackii (Maximowicz) Maximowicz; C. maackii (Maximowicz) Nakai; C. maackii var. koreiensis Nakai.

Herbs 40–150 cm tall, perennial. Roots tuberous, fusiform. Stems grayish white, erect, branched or unbranched, unwinged, with multicellular hairs and densely felted above. Leaves with smooth surface, concolorous with crispate hairs along veins or ± discolorous, abaxially grayish green and cobwebby. Basal and lower cauline leaves often concolorous, with winged petiole, wing spiny or with triangular spine-tipped teeth; leaf blade elliptic to lanceolate, 15–30 × 7–9 cm, pinnately divided; segments 4–8 pairs, elliptic, with unequal triangular teeth with lateral spines less than 1 mm and a ca. 5 mm apical spine; terminal segment largest. Middle and upper cauline leaves similar but sessile, smaller, sometimes undivided, discolorous, auriculate semiamplexicauli. Capitula 1 or several, corymbose, erect or nodding. Involucrce campanulate, ca. 2 cm in diam., glabrous or sparsely cobwebby. Phyllaries in ca. 5 rows, lacking marginal spinules, wings, and scarious appendage; abaxially with a dark resinous gland; outer and middle phyllaries triangular-lanceolate to lanceolate, 6–13 × 2–2.5 cm, margin ciliate, apex acute and tipped with a spine less than 0.5 mm; inner phyllaries lanceolate to linear-lanceolate, 1.3–2.3 × 0.2–0.3 cm. Florets bisexual. Corolla purplish red, ca. 2.4 cm, tube ca. 1.2 cm. Achene yellowish, ca. 4 mm. Pappus bristles white, ca. 2 cm. Fl. and fr. Jun–Sep. 2n = 34, 36.

Grasslands on mountain slopes, forest margins, meadows, near villages; 100–1100 m. S Anhui, Hebei, Heilongjiang, Jiangsu, Jilin, Liaoning, SE Nei Mongol, E Shandong, Sichuan, N Zhejiang [Korea, Russia].


总序蓟 总序蓟 总序蓟

Herbs to 1.5 m tall, perennial. Stems erect, branched above, ribbed, unwinged, with long multicellular hairs and cobwebby; synflorescence branches densely felted. Leaves dis-
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colorful, surface smooth, abaxially grayish white and densely felited, adaxially green and with multicellular hairs. Basal leaves withered at anthesis. Cauline leaves sessile, narrowly elliptic, 9–21 × 4–7 cm, pinnately lobed or pinnatifid, auriculate semiamplexicaul; segments 3–8 pairs, elliptic to broadly triangular, toothed; teeth fringed with ca. 2 mm spinules and with a ca. 4 mm apical spine; terminal segment largest. Bracts similar to leaves or with spiny teeth. Peduncles ca. 2 cm. Capitula 4–8, racemose. Involucre campanulate, 2.5–3 cm in diam., glabrous or sparsely cobwebby. Phyllaries imbricate, in ca. 6 rows, lacking marginal spinules, wings, and scarious appendage; outer and middle phyllaries triangular to triangular-lanceolate, 6–9 × 1–1.5 mm, abaxially with a dark resinous gland, apex acute and tipped with a 0.8–1.2 mm spine; inner phyllaries linear-lanceolate to linear, 14–22 × 0.5–1.5 mm, apex acuminate and scarious. Florets bisexual. Corolla purplish red, ca. 2.3 cm, tube ca. 1.2 cm. Achene yellowish, ca. 5 mm, striate. Pappus bristles dirty brown, ca. 2.2 cm. Fl. and fr. Apr–Jun.

● Mountain valleys, mountain slopes, forests, forest margins; 1000–1300 m. W Fujian, NE Guangxi, SW Guizhou, SW Hunan, NE Jiangxi, SE Yunnan.


峨眉蓟 e mei ji

Herbs to 1.2 m tall, perennial. Stems branched above, ribbed, unwinged, with long sparse multicellular hairs. Leaves concolorous, green, surface smooth, glabrous or abaxially with sparse long multicellular hairs. Basal leaves present at anthesis. Lower cauline leaves petiolate; petiole base auriculate, ca. 0.5 mm cilia, and a few triangular teeth with a ca. 2 mm apical spine. Middle and upper cauline leaves similar but sessile, gradually smaller upward, semiamplexicaul. Bracts linear to linear-lanceolate, toothed, teeth with an apical spine to 6 mm. Capitula few, terminal on long branches, nodding. Involucre broadly campanulate, ca. 4.5 cm in diam., glabrous or sparsely cobwebby. Phyllaries in ca. 7 rows, lacking marginal spinules, wings, and scarious appendage; outer and middle phyllaries triangular to lanceolate, 6–15 × 1.5–3 mm, abaxially with a dark resinous gland, margin sparsely ciliate, apex acute and tipped with a 0.5–1 mm spine; inner and innermost phyllaries linear to broadly linear, ca. 2.4 × 0.2–0.3 cm, apex acuminate. Florets bisexual. Corolla red, ca. 2.1 cm, tube ca. 6 mm. Achene ca. 3.5 mm, many ribbed. Pappus bristles brown, ca. 2 cm. Fl. and fr. Jul.

● Grasslands on mountain slopes; 2300–2400 m. Sichuan.


林蓟 lin ji

Cirsium diamantiacum (Nakai) Nakai; C. japonicus Candolle var. litorale (Maximowicz) Kitamura; C. litorale Maximowicz; C. litorale var. nudum Regel; C. maiackii Maximowicz var. spiniferum Nakai; C. pendulum Fischer ex Candolle var. oligocephalum Regel & Tiling; Cnicus diamantiacicus Nakai; C. japonicus (Candolle) Maximowicz var. schantarensis (Trautvetter & C. A. Meyer) Maximowicz.

Herbs 70–120 cm tall, perennial. Stems erect, diffusely branched above, unwinged, with sparse long multicellular hairs. Leaves concolorous, green, surface smooth, glabrous or with sparse multicellular hairs. Basal leaves withered at anthesis. Lower and middle cauline leaves petiolate; petiole base auriculate semiamplexicaul, margin winged and spiny or with spiny teeth; leaf blade elliptic, narrowly ovate to triangular-lanceolate, 14–27 × 8–12 cm, pinnately divided; segments 4–8 pairs, obliquely triangular, lanceolate, or broadly linear, fringed with spinules; terminal segment lanceolate. Upper cauline leaves sessile, progressively smaller, pinnately lobed or uppermost ones undivided, semiamplexicaul. Peduncles long. Capitula few, terminal, nodding. Involucre campanulate, ca. 2 cm in diam., glabrous or sparsely cobwebby. Phyllaries imbricate, in ca. 6 rows, lacking marginal spinules, wings, and scarious appendage, abaxially with or without a resinous gland; outer and middle phyllaries triangular to ovate-triangular, 5–8 × 1.5–2 mm, apex narrowed into a ca. 1 mm spine; inner phyllaries lanceolate to linear-lanceolate, 10–12 × 2 cm, apex narrowed into a soft spine and scarious. Florets bisexual. Corolla purplish red, ca. 1.6 cm, tube ca. 5 mm. Achene yellowish, ca. 4.5 mm. Pappus bristles brownish, ca. 1.6 cm. Fl. and fr. Jun–Sep. 2n = 34.

Forests, forest margins, along rivers, meadows; 1500–2000 m. Heilongjiang, Jilin, Liaoning [Russia].


准噶尔蓟 zhun ga er ji

Serratula alata S. G. Gmelin, Reise Russland 1: 155. 1770–1774; Cardus desertorum (Fischer ex Link) Steudel; Cirsium desertorum Fischer ex Link; C. desertorum var. sinuatolobatum Trautvetter; C. desertorum var. subintegerrimum Trautvetter; C. elodes M. Bieberstein var. setigerum (Ledebour) Krylov; C. elodes var. sinuatolobatum (Trautvetter) O. Fedtschenko & B. Fedtschenko; C. elodes var. subintegerrimum (Trautvetter) O. Fedtschenko & B. Fedtschenko; C. setigerum Ledebour.

Herbs 30–100 cm tall, perennial. Roots tuberous, fusiform. Stem solitary, usually branched above; wings undulate, with ca. 5 mm stout rigid spines. Leaves concolorous, green, surface smooth, glabrous. Basal leaves with winged petiole; leaf blade elliptic, to 30 × 4 cm, margin with teeth ending in a 4–9 mm spine. Lower and middle cauline leaves similar but sessile, decurrent, gradually smaller upward. Upper cauline leaves lanceolate to elliptic. Capitula 1 to several, terminal, corymbose to corymbose-paniculate. Involucre ovoid, ca. 1.5 cm in diam., glabrous. Phyllaries in ca. 6 rows, lacking marginal spinules, wings, and scarious appendage; outer phyllaries ovate, ca. 3 × 1.2 mm, apex acute and tipped with a ca. 1.5 mm spine; middle phyllaries linear-lanceolate, 5–8 × 1.7–2 mm, apex acute and tipped with a ca. 2 mm spine; inner phyllaries linear, 8–9 × ca. 1.5 mm, apex acuminate and scarious. Florets bisexual. Corolla reddish purple, 1.8–1.9 cm, tube 7–8 mm. Achene yel-
lowish, ca. 3 mm. Pappus bristles white, 1.2–1.3 cm. Fl. and fr. Jul–Aug. 2n = 34.

Flooded lands, grasslands by lakes, farmlands; 400–1500 m. Xinjiang (Junggar Pendi, Tian Shan) [Kazakhstan, Russia, Uzbekistan; E Europe].


斑鸠蓟 ban jiu ji

Herbs, perennial. Rhizome tuberous. Stem solitary, erect, ribbed, unwinged, with long multicellular hairs and cobwebby, densely felted below capitula. Leaves discolorous, green, surface smooth, abaxially grayish white and densely felted, adaxially green and with multicellular hairs. Lower cauleine leaves withered at anthesis. Middle and upper cauleine leaves with petiole to 1.5 cm; leaf blade elliptic to lanceolate-elliptic, 8–11 × 2.5–4.5 cm, undivided, base cuneate, fringed with ca. 1 mm incurred spinules and sometimes alternating with ca. 2 mm patent spinules, apex acuminate. Capitula several, corymbose, erect. Involucre 2–2.5 cm in diam., glabrous. Phyllaries imbricate, in ca. 8 rows, lacking marginal spinules, wings, and scarious appendage; outer and middle phyllaries 3–10 × 1.5–3 mm, basal portion triangular, lanceolate, or elliptic, apical portion subulate and narrowed into a 3–7 mm spine; inner phyllaries elliptic to linear, 1.5–2 × 0.2–0.3 cm, apex acuminate and scarious. Florets bisexual. Corolla purple, ca. 2.1 cm, tube ca. 1 cm. Achene ca. 6 mm. Pappus bristles dark brown, ca. 1.8 cm. Fl. and fr. Oct.

● Guangxi (Yangshuo).


骆驼 luo qi

Herbs to 1.7 m tall, perennial. Stems erect, branched above, ribbed, unwinged, with sparse multicellular hairs and cobwebby. Leaves concolorous, green, surface smooth, glabrous or with sparse multicellular hairs. Basal leaves present at anthesis. Lower and middle cauleine leaves with winged petiole, base auriculate and semiamplexicaul, wing spiny or with spiny teeth; leaf blade elliptic, to 27 × 7 cm, pinnately divided; segments ca. 6 pairs, semiorbiculate, ovate-lanceolate, or broadly triangular, margin spiny or with triangular teeth tipped with a 1–4 cm spine. Upper cauleine leaves similar but sessile, lanceolate, gradually smaller upward, auriculate semiamplexicaul, margin with teeth ending in a 1–4 cm spine. Capitula few to many, laxly corymbose to corymbose-panicle or rarely solitary, ± nodding. Involucre campanulate, 3–4.5 cm in diam., glabrous. Phyllaries imbricate, in ca. 7 rows, lacking an abaxial resinous gland, marginal spinules, wings, and scarious appendage; outer and middle phyllaries 0.7–1.5 cm × 1.5–2 mm, basal portion lanceolate, apical portion subulate, patent to reflexed, and narrowed into a short and soft spine; inner phyllaries linear-subulate, ca. 18 × 1.5 mm, apex narrowed into a short soft spine. Florets bisexual. Corolla purple, ca. 2.1 cm, tube ca. 1.2 cm. Achene brown, ca. 3.2 mm. Pappus bristles brownish, ca. 2 cm. Fl. and fr. May–Sep.

● Guangxi (Yangshuo).

32. Cirsium pendulum Fischer ex Candolle, Prodr. 6: 650. 1838.

烟管蓟 yan guan ji

Cirsium hilgendorfii (Franchet & Savatier) Makino; C. provostii (Franchet) Petrak; Cnicus hilgendorfii Franchet & Savatier; C. pendulus (Fischer ex Candolle) Maximowicz; C. provostii Franchet.

Herbs 1–3 m tall, perennial. Stems erect, branched above, stout, unwinged, sparsely cobwebby and with long multicellular hairs. Leaves concolorous, surface smooth, green, glabrous. Basal and lower cauleine leaves sessile or with winged petiole; leaf blade ± narrowly elliptic to oblanceolate, 40–50 × ca. 20 cm, bipinnatipartite; primary segments 5–7 pairs; ultimate lobes obliquely triangular, fringed and tipped with ca. 3 mm spines; terminal lobe of segments narrowly lanceolate to broadly linear. Middle and upper cauleine leaves sessile, gradually smaller upward, semiamplexicaul. Capitula several, terminal, racemose-paniculate, nodding. Involucre campanulate, 3.5–5 cm in diam., glabrous. Phyllaries imbricate, in ca. 10 rows, lacking an abaxial resinous gland, marginal spinules, wings, and scarious appendage; outer and middle phyllaries 1–4 × 0.1–0.3 cm, basal portion triangular to lanceolate, apical portion subulate and reflexed; inner and innermost phyllaries lanceolate to linear-lanceolate, 1.2–2.5 × ca. 0.2 cm, apex acuminate-subulate. Florets bisexual. Corolla purple to red, ca. 2.2 cm, tube filiform, ca. 1.6 cm. Achene ca. 4 mm. Pappus bristles dirty white, ca. 2.2 cm. Fl. and fr. Jun–Sep. 2n = 34.

Grasslands in mountain valleys and on mountain slopes, forests, forest margins, streamsides, near villages, rock crevices; 300–2300 m. SE Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, WC Yunnan [Japan, Korea, Mongolia, Russia].


杭_: hang ji

Herbs to 1 m tall, perennial. Stems erect, branched above, unwinged, felted below capitula. Leaves concolorous, green, surface smooth, with sparse crispate hairs along veins or glabrous. Upper cauleine leaves with winged petiole 2–2.5 cm; leaf blade elliptic to rarely ovate, 10–15 × 6–7 cm, undivided, margin serrulate, teeth with lateral spinules less than 1 mm, apex acute and with a 1–1.5 mm spine. Uppermost leaves and bracts similar but narrower. Capitula few to many, corymbose, erect, not surrounded with pectinately spiny pungent bracts. Involucre ovoid, 2–2.5 cm in diam., glabrous. Phyllaries imbricate, in ca. 8 rows; outer and middle phyllaries triangular-lanceolate, ovate-lanceolate, or linear-elliptic, 5–16 × 2–3 mm, apex tipped with a 0.5–1 mm spine; inner phyllaries linear to broadly linear, ca. 18 × 1–2 mm, apically expanded into a scarious red appendage. Florets bisexual. Corolla white, ca. 2.3 cm, tube ca. 1.1 cm. Achene ca. 4.5 mm. Pappus bristles white, ca. 2 cm. Fl. and fr. Oct.

● Forests; ca. 1300 m. Zhejiang (Tianmu Shan).

*Cirsium chinense* var. *laushanense* (Y. Yabe) Kitamura; *C. laushanense* Y. Yabe; *C. lineare* (Thunberg) Schultz Bipontinus var. *glabrescens* Petrak; *C. lineare* var. *laushanense* (Y. Yabe) Kitamura; *C. lineare* var. *tchefouensis* (Debeaux) Y. Ling; *C. manshuricum* Kitagawa; *C. tchefouensis* Debeaux; *C. uninerrium* (H. Léveillé & Vaniot) Nakai var. *laushanense* (Y. Yabe) Kitagawa; *Cnicus chinesis* (Gardner & Champion) Bentham ex Maximowicz; *C. tchefouensis* (Debeaux) Franchet.

Herbs 40–100 cm tall, perennial. Stems erect, branched in upper half, rarely unbranched, unwinged, with crispate hairs, below capitula also ± cobwebby. Leaves concordorous, green, surface smooth, glabrous or with long crispate hairs along veins. Basal and lower cauline leaves petiolate; leaf blade elliptic to lanceolate and pinnately divided or narrower to sometimes linear and undivided, 5–7 × 1–4 cm; segments (when present) 3 or 4 pairs, margin with 3 or 4 unequal teeth with 1–2 mm lateral spinules and a to 4 mm apical spine. Middle and upper cauline leaves usually undivided, margin with spines to 3 mm. Capitula (1 or) few, irregularly corymbose, not surrounded with pectinately spiny pungent bracts. Involucre ovoid, 2–2.5 cm in diam., glabrous. Phyllaries imbricate, in ca. 7 rows, abaxially often with a dark resinous gland; outer phyllaries triangular, 5–8 × 1.2–2 mm, apex acute to acuminate and tipped with a ca. 0.5 mm spine; middle and inner phyllaries lanceolate to linear-lanceolate, 1–1.4 cm × 2–3 mm; inner phyllaries apically expanded into a scarious purplish pink denticulate appendage. Florets bisexual. Corolla purplish red to pink, 2–2.2 cm, tube equaling limb. Achene ca. 2.5 mm. Pappus brownish to dirty white, ca. 1.5 cm. Fl. and fr. May–Oct.

Mountain slopes, thickets, forest margins, grasslands, roadsides, wastelands, farmlands; 500–2500 m. S Anhui, Chongqing, Fujian, S Gansu, Guangdong, Guizhou, Hebei, Henan, Hubei, Hunan, NE Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, NE Thailand, Vietnam].

*Cirsium lineare* is variable in leaf shape and papillosity as well as features of the involucre, but any attempt at subdividing it is premature. *Cirsium hupehense* is sometimes regarded as distinct; it was described with phyllaries ending in long, patent to recurved spines, a feature we have not observed in any of our material.


线叶蓟 xian ye ji

*Carduus linearis* Thunberg in Murray, Syst. Veg., ed. 14, 726. 1784; *Cirsium hupehense* Pampanini; *C. lineare* var. *franchetti* Kitamura; *C. lineare* var. *latisilium* H. C. Fu; *C. lineare* f. *oreithales* (Hance) Koyama; *C. lineare* f. *pallidum* Kitamura; *C. lineare* var. *pallidum* (Kitamura) Y. Ling; *C. lineare* var. *salicifolium* Y. Ling; *C. lineare* var. *tsoungianum* (Y. Ling) Y. Ling; *C. oreithales* Hance; *C. tsoungianum* Y. Ling; *Cnicus linearis* (Thunberg) Bentham & J. D. Hooker ex Franctch & Savatier; *Spanioptilon lineare* (Thunberg) Lessing.

Herbs (0.3–)0.6–1.5 m tall, perennial. Stems erect, branched from base or above, ribbed, unwinged, cobwebby and with long crispate hairs to glabrous. Leaves discolorous, abaxially grayish white and cobwebby, adaxially green, glabrous, with some crispate hairs, or ± densely covered with hair-tipped papillae and surface slightly rough but not spiny. Lower and middle cauline leaves sessile or shortly petiolate; leaf blade ovate, lanceolate, elliptic, or oblanceolate, 6–18(–23) × 1.5–3(–5) cm, undivided or rarely with a few lobules or teeth in proximal third, base cuneate, margin ± regularly spiny, apex obtuse to caudate-acuminate. Upper cauline leaves similar but always sessile, often narrower, gradually smaller upward. Capitula terminal, laxly corymbose, not surrounded with pectinately spiny pungent bracts. Involucre ± narrowly ovoid, 1–2.5 cm in diam., glabrous. Phyllaries imbricate, in ca. 6 rows, abaxially with a dark resinous gland; outer and middle phyllaries triangular-lanceolate, 5–8 × ca. 1 mm, tipped with a spine to 2 mm; inner phyllaries triangular-lanceolate to linear, 10–15 × 1–3.5 mm, apically expanded into a scarious, acuminate, pale or purplish pink, and irregularly denticulate appendage. Florets bisexual. Corolla purplish red to pink, 2–2.2 cm, tube equaling limb. Achene ca. 2.5 mm. Pappus brownish to dirty white, ca. 1.5 cm. Fl. and fr. Aug–Oct.

Herbs 30–150 cm tall, perennial. Stems erect, or unbranched, ribbed, unwinged, with long multicellular hairs and felted. Leaves discolorous, surface smooth, abaxially grayish white and densely felted, adaxially green and glabrous or with long crispate hairs. Middle cauline leaves sessile or petiolate; leaf blade ovate, lanceolate, or ± narrowly elliptic, 5–14 × 1–6 cm, pinnately lobed to pinnatifid to almost in proximal half; segments 3–6 pairs, obliquely triangular to obliquely elliptic, with a 3–6 mm apical spine; terminal segment narrowly triangular to linear. Upper cauline leaves similar but gradually smaller upward. Capitula (1 or) few to many, terminal, paniculate-corymbose, not surrounded with pectinately spiny pungent bracts. Involucre ovoid, 2–2.5 cm in diam., glabrous. Phyllaries imbricate, in ca. 7 rows, abaxially with a dark resinous gland; outer phyllaries triangular-lanceolate to ovate-lanceolate, 8–10 mm, tipped with a ca. 1 mm spine; middle and inner phyllaries lanceolate to broadly linear, 12–17 × 1.2–3 mm; inner phyllaries apically expanded into a scarious, pale to pink, and often denticulate appendage. Florets bisexual. Corolla pink to purple, ca. 1.8 cm, tube ca. 8 mm. Achene ca. 4 mm. Pappus bristles brownish, ca. 1.5 cm. Fl. and fr. May–Nov.
Cirsium semenowii

Herbs 50–60(–80) cm tall, perennial. Stems erect, branched above, unwinged, with sparse long multicellular hairs and cobwebby. Leaves concolorous, green, surface smooth, glabrous. Lower and middle cauline leaves with long, winged petiole; wing margin with spines and spine-tipped teeth; leaf blade lanceolate, linear-lanceolate, or elliptic, to 15 × 3.5 cm, pinnatifid; segments 4–6 pairs, elliptic to ovate, with unequal triangular teeth, teeth with a 0.3–2 mm spinule. Upper cauline leaves similar but sessile, gradually smaller upward, semiamplexicaul. Capitula few to many, terminal, corymbose to corymbose-paniculate, erect or nodding, surrounded by pectinately spiny bracts with long pungent spines. Involucre ovoid, ca. 2(–3) cm in diam., glabrous or very sparsely cobwebby. Phyllaries in 7 or 8 rows, lacking marginal spinules, wings, and scarious appendage; outer phyllaries 10–14 × 2–2.5 mm, basal portion truncate, apical portion subulate and narrowed into a 6–9 mm spine; middle phyllaries 12–13 × ca. 2.5 mm, basal portion ovate, apical portion subulate and narrowed into a 5–6 mm spine; inner phyllaries linear to linear-lanceolate, 12–15 × 1.5–2 mm, apex acuminate and scarious. Florets bisexual. Corolla red, ca. 1.9 cm, tube ca. 8 mm. Achene brown, ca. 5 mm. Pappus bristles brownish, ca. 1.5 cm. Fl. and fr. Jun–Oct.

Alpine meadows, forests, by water, wastelands; 1700–3000 m. Xinjiang (Tian Shan) [Kazakhstan, Uzbekistan].
surrounded by pectinately spiny bracts with long pungent spines. Involucre subovoid to campanulate, ca. 2 cm in diam., glabrous. Phyllaries imbricate, in 7 or 8 rows, lacking marginal spines, wings, and scarious appendage; outer and middle phyllaries 8–16 × 2–3 mm, basal portion triangular, ovate, or lanceolate, apical portion subulate, patent to reflexed, and tipped with a 4–8 mm spine; inner and innermost phyllaries lanceolate to linear, 12–20 × 1–2 mm, apex acuminate and scarious. Florets bisexual. Corolla yellow or white, ca. 1.9 cm, tube ca. 8 mm. Achene brown with darker striae, ca. 4 mm. Pappus bristles white, ca. 1.5 cm. Fl. and fr. Jul–Sep.

Forest margins in mountain valleys, mountain slopes, flooded lands, by streams; 1000–2400 m. Xinjiang (Tian Shan) [Kazakhstan].

41. Cirsium argyracanthum Candolle, Prodr. 6: 640. 1838.

**南蓟** nan ji

*Cirsium tibeticum* Kitamura; *Cnicus argyracanthus* (Candolle) C. B. Clarke.

Herbs 30–100 cm tall, perennial. Stems erect, branched above, unwinged, with sparse long multicellular hairs, also cobwebby above. Leaves concolorous, green, surface smooth, with long multicellular hairs along veins. Middle cauline leaves sessile, elliptic-lanceolate to elliptic, 8–14 × 2–4 cm, pinnately divided, auriculate semiamplexicaul; segments 4–9 pairs, each with 3–5 unequal teeth with 1–2 mm lateral spinules and a 4–7 mm apical spine. Upper cauline leaves with sparse teeth tipped with a 0.7–1.4 cm spine. Capitula few to many, spicate, racemose, or racemose-paniculate, erect, surrounded by pectinately spiny bracts with pungent spines to 1.5 cm. Involucre ovoid, 1.5–2 cm in diam., glabrous. Phyllaries imbricate, in ca. 6 rows; outer phyllaries triangular, 7–8 × 1.5–2 mm, narrowed into a 3–4 mm spine; middle phyllaries lanceolate to ovate-lanceolate, ca. 10 × 2 mm, lacking membranous wings, narrowed into a 2–3 mm apical spine; inner phyllaries linear-elliptic to broadly linear, ca. 13 × 2–3 mm, apically expanded into a scarious appendage. Florets bisexual. Corolla purple or white, ca. 1.6 cm, tube ca. 8 mm. Achene yellowish, ca. 3 mm. Pappus bristles brownish, ca. 1.4 cm. Fl. and fr. Jun–Oct. 2n = 34.

Forests, forest margins, grasslands, thickets by rivers, by farmlands; 2100–3700 m. Xizang [India, Nepal, Pakistan].


**无毛蓟** wu ma'o ji


Herbs 70–100 cm tall, perennial. Stems erect, ribbed, unwinged, with sparse multicellular hairs. Leaves concolorous, green, surface smooth, abaxially with scattered multicellular hairs, adaxially glabrous. Middle cauline leaves sessile, elliptic to elliptic-lanceolate, to 20 × 8 cm, pinnately divided, semiamplexicaul; segments 5 or 6 pairs, elliptic, ovate, or triangular-ovate, with 3–5 unequal teeth tipped with a 5–12 mm spine. Upper cauline leaves similar but narrower, gradually smaller upward, undivided but with spiny teeth and apex. Capitula many, paniculate, surrounded by pectinately spiny bracts with long pungent spines. Involucre ovoid, 1.5–2 cm in diam., glabrous or very sparsely cobwebby. Phyllaries imbricate, in ca. 6 rows; outer phyllaries lanceolate, 6–7 × 1–2 mm, basal portion usually with pectinately spinulose margin, narrowed into a ca. 3 mm apical spine; middle phyllaries triangular-lanceolate to lanceolate, 12–15 × 2–3 mm, above base with loosely and irregularly lacerate scarious wings, apically spine-tipped; inner phyllaries linear-lanceolate, ca. 15 × 2 mm, apically with a spiny-tipped appendage. Florets bisexual. Corolla purplish red, ca. 1.8 cm, tube ca. 9 mm. Achene yellowish with darker striae, ca. 4 mm. Pappus bristles brownish, ca. 1.5 cm. Fl. and fr. Aug–Sep.

Mountain slopes, thickets; 2500–2700 m. Xinjiang (Tian Shan), S Xizang [India, Kashmir, Kazakhstan, Uzbekistan].


**附枝蓟** fu zhi ji


Herbs 1–2 m tall, perennial. Stems erect, long branched, unwinged, with sparse long multicellular hairs. Leaves concolorous, green, surface smooth, glabrous or ± hairy. Upper cauline leaves sessile, elliptic to lanceolate, 10–18 × 3–6 cm, pinnately lobed or pinnatifid; segments 3–5 pairs, obliquely ovate to semioblong, with 3–5 unequal triangular teeth each with few to many lateral spines and a 4–6 mm apical spine. Capitula 3–6 in terminal cluster or many, terminal, and paniculate, surrounded by pectinately spiny bracts with long pungent spines. Involucre narrowly ovoid, 1.5–2 cm in diam., glabrous. Phyllaries imbricate, in ca. 7 rows; outer and middle phyllaries 3–10 × 1–2 mm, above base with densely and regularly denticate-lacerate wings, apex narrowed into a 1–3 mm spine; inner phyllaries 10–12 × 1 cm, apex acuminate and scarious. Florets bisexual. Corolla purplish red, ca. 2 cm, tube as long as limb. Mature achene not seen. Pappus bristles brownish, ca. 1.5 cm. Fl. and fr. Jul–Oct.

Forests on mountain slopes, by water; 1600–2000 m. Xinjiang [Kazakhstan, Russia, Uzbekistan].


**黄苞蓟** huang bao ji

Herbs to 1 m tall, perennial. Stems erect, branched above, unwinged. Leaves discolorous, abaxially grayish white and sparsely cobwebby, adaxially green, rough, and densely covered with ca. 0.5 mm spines. Lower and middle cauline leaves not seen. Upper leaves of branches sessile, elliptic to lanceolate, 4–8 × 2 cm, pinnately lobed; segments ca. 3 pairs, lanceolate to obliquely triangular-ovate, with 2–4 unequal triangular teeth fringed with spines less than 0.5 mm and with a 5–10 mm apical spine. Bracts numerous, lanceolate, with spiny teeth and marginal spines to 2 cm. Capitula corymbose, erect. Involucre campanulate, 3–3.5 cm in diam., glabrous. Phyllaries imbricate, in ca. 8 rows, straight, appressed;
outer and middle phyllaries elliptic to lanceolate, 8–25 × 2–3 mm, margin above base expanded into yellowish, scarious lacerate wings, apex narrowed into a spine; inner phyllaries lanceolate to linear, apically expanded into a short and narrow, acuminate, and spine-tipped appendage. Flores bisexual. Corolla purplish red. Mature achene unknown. Pappus bristles yellowish, ca. 1.5 mm. Fl. Aug.

- Mountain slopes; ca. 3500 m. S Xizang (Nyalam).

*Cirsium chrysoplepis* is allied to *C. flavisquamatum* Kitamura from Nepal but differs in having cobwebby leaves.


丝路蓟 si lu ji

Herbs 30–160 cm tall, perennial, dioecious. Roots far creeping, bearing adventitious shoots. Stems erect, branched above, unwinged. Leaf surface smooth. Capitula often numerous, terminal, corymbose. involucre ± narrowly ovoid, 1.5–2 cm in diam. Phyllaries imbricate, in 5–7 rows, lacking wings and scarious appendage; outer and middle phyllaries triangular to ovate, 3–8 × 1.2–2.5 mm, apex acute; inner phyllaries elliptic-lanceolate to broadly linear, 9–20 × 1–3 mm, apex acute to acuminate and scarious. Corolla reddish purple or rarely white; female florets 1.6–2.4 cm, tube 1.3–1.8 cm; male florets 1.5–1.8 cm, tube 0.9–1.2 cm. Achene yellowish, 3–4.5 mm. Pappus bristles dirty white, 2.5–3.5 cm.

Moist places, ditches, farmlands, lakesides, mountain slopes, near villages, by rivers, wet or flooded lands; 100–4300 m. Anhui, Chongqing, Fujian, Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jiangxi, Jilin, Liaoning, Neimongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Zhejiang [Afghanistan, India, Kazakhstan, Nepal; SW Asia, Europe].

*Silk road chrysoplepis* is one of the world’s most noxious weeds of cultivated land. Its strong potential for vegetative multiplication from long trailing roots or root fragments results in morphologically uniform clonal stands, which at times have led to the recognition of some of the variants as distinct species.

1a. Lower cauline leaves pinnately divided, segments with 2–5 triangular spiny teeth.

2a. Leaves ± concolorous, green, glabrous or abaxially sparsely cobwebby ...................... 45a. var. arvense

2b. Leaves discolorous, abaxially grayish white and densely felted, adaxially green and glabrous ......... 45b. var. alpestre

1b. Lower cauline leaves simple, or if lobed then with entire spinulose lobes.

3a. Leaves ± concolorous, green, glabrous or abaxially sparsely cobwebby ...................... 45c. var. integrifolium

3b. Leaves discolorous, abaxially grayish white and densely and thickly felted, adaxially green and glabrous or sparsely cobwebby .......................... 45d. var. vestitum

45a. *Cirsium arvense* var. arvense

丝路蓟(原变种) si lu ji (yuan bian zhong)

*Serratula arvensis* Linnaeus, Sp. Pl. 2: 820. 1753; *Breea arvensis* (Linnaeus) Lessing; *Carduus arvensis* (Linnaeus) Robson; *Cephalonoplos arvensis* (Linnaeus) Fourrerau; *Cirsium ochrolepidum* Juzepczuk; *Cnicus arvensis* (Linnaeus) Roth.

Stems glabrous but sparsely cobwebby below capitula. Leaves ± concolorous, green, glabrous or abaxially very sparsely cobwebby. Lower cauline leaves ± shortly petiolate; leaf blade elliptic to lenticulate, 7–17 × 1.5–4.5 cm, pinnately lobed or pinnatifid; segments 3–5 pairs, obliquely triangular to obliquely elliptic, with 2 or 3 teeth each with lateral spinules and a ca. 5 mm apical spine. Middle and upper cauline leaves similar but sessile, base semiamplexicaul. involucre very sparsely cobwebby. Outer and middle phyllaries with a ca. 0.5 mm patent to reflexed apical spine. Fl. and fr. Jun–Sep. 2n = 34, 34+0–1B, 51, 68.

Moist places by ditches, farmlands, lakesides; 700–4300 m. Gansu, Xinjiang, Xizang [Afghanistan, India, Kazakhstan, Nepal; SW Asia, Europe].

45b. *Cirsium arvense* var. alpestre


西藏 zang ji

*Aplotaxis cirsioides* Candolle; *Cephalonoplos arvensis var. alpestris* (Nägeli) Kitamura; *Cirsium lanatum* (Willdennow) Sprengel; *Cnicus lanatus* Willdenow.

Stems densely cobwebby-felted or glabrous. Leaves discolorous, abaxially grayish white and densely felted, adaxially green and glabrous. Lower cauline leaves sessile or shortly petiolate; leaf blade elliptic to oblanceolate, 7–12 × 2.5–3 cm, pinnately lobed or pinnatifid or lower ones undivided, base cuneate; segments (0–)3–5 pairs, semiobtuse, broadly ovate, or elliptic, with (2 or)3–5 triangular teeth each with lateral spinules and a 3.5–10 mm apical spine. Upper cauline leaves similar but smaller. involucre glabrous. Outer and middle phyllaries tipped with a 2.5–4 mm spine. Fl. and fr. Jun–Sep.

Grasslands on mountain slopes, moist places, roadsides, near villages; 500–4300 m. Gansu, Qinghai, Xinjiang, Xizang [Europe].

45c. *Cirsium arvense* var. integrifolium

Wimmer & Grabowski, Fl. Siles. 2(2): 92 [“82”]. 1829.

刺儿菜 ci er cai

*Breea segetum* (Bunge) Kitamura; *Carduus segetum* (Bunge) Franchet; *Cephalonoplos segetum* (Bunge) Kitamura; *Cirsium argunense* Candolle; *C. arvense* f. albilorum Kitagawa; *C. arvense* var. mite Wimmer & Grabowski; *C. arvense* var. setosum (Willdennow) C. A. Meyer; *C. arvense* var. subulatum (Ledebour) Ledebour; *C. laevigatum* Tausch; *C. segetum* Bunge; *C. setosum* (Willdennow) M. Bieb; *C. setosum* f. albilorum (Kitagawa) Kitagawa; *C. setosum var. subulatum* Ledebour; *Cnicus arvensis* var. setosus (Willdennow) Maximowicz; *C. setosus* (Willdennow) Besser; *Serratula setosa* Willdenow.
Stems glabrous or sparsely felted. Leaves ± concolorous, surface smooth, abaxially green to grayish green and glabrous or sparsely cobwebby, adaxially green and glabrous. Lower and middle cauline leaves usually sessile, ± narrowly elliptic to elliptic-lanceolate, 7–15 × 1.5–10 cm, undivided or sometimes pinnately divided into entire lobes, base usually cuneate, margin entire and densely fringed with tender spinules, apex obtuse to rounded. Upper cauline leaves elliptic, lanceolate, or linear-lanceolate, gradually smaller upward. Involucre glabrous. Outer and middle phyllaries with an apical spine less than 0.5 mm. Fl. and fr. May–Sep.

Mountain slopes, by rivers, wet lands, farmlands; 100–2700 m. Anhui, Chongqing, Fujian, Gansu, Guizhou, Hebei, Heilongjiang, Hebei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Zhejiang [Japan, Korea, Mongolia, Russia; SW Asia, Europe].

Cirsium arvense var. integrifolium is the most common variant in China. The whole plant is used medicinally.

45d. Cirsium arvense var. vestitum Wimmer & Grabowski, Fl. Siles. 2(2): 92 [“82”]. 1829.

阿尔泰蓟 a er tai ji

Cirsium argenteum (Peyer ex Vest) Fiori; C. arvense var. argenteum (Peyer ex Vest) Fiori; C. arvense var. incanum (S. G. Gmelin) Ledebour; C. incanum (S. G. Gmelin) Fischer ex M. Bieberstein; Serratula incana S. G. Gmelin.

Stems grayish white, cobwebby-felted in upper half. Leaves discolorous, abaxially grayish white and densely felted, adaxially green and glabrous or sparsely cobwebby. Lower and middle cauline leaves sessile with cuneate base, elliptic to ovate, 7–8 × ca. 3.4 cm, undivided or sometimes pinnately divided into entire lobes, base cuneate, densely fringed with ca. 0.2–0.5 mm spinules. Upper cauline leaves similar but smaller.

Involucre glabrous. Outer and middle phyllaries tipped with a ca. 1 mm spine. Fl. and fr. Aug–Sep. 2n = 34, 68.

Grasslands on flooded lands; 500–1700 m. Xinjiang (Altay Shan) [Kazakhstan; SW Asia, Europe].

46. Cirsium shihianum Greuter, nom. nov.

薄叶蓟 bao ye ji


Herbs to 40 cm tall, ?annual, dioecious. Stems erect, unbranched or rarely with up to 10 branches above, unwinged, with sparse long multicellular hairs. Leaves subconcolorous, abaxially pale green and glabrous or very sparsely cobwebby, adaxially green and with sparse long multicellular hairs. Lower cauline leaves withered at anthesis. Middle cauline leaves sessile, elliptic to elliptic-lanceolate, 6–18 × 1.3–2 cm, undivided, auriculate semiamplexicaul, fringed with ca. 3 mm spinules alternating with ca. 5 mm spines, apex acute to acuminate. Upper cauline leaves linear-lanceolate to narrowly linear, gradually smaller upward. Capitula 1 to few. Involucre narrowly ovoid to narrowly ellipsoid, 1.5–2 cm, glabrous. Phyllaries imbricate, in ca. 7 rows, lacking wings and scarious appendage; outer phyllaries triangular, ca. 5 × 1–1.5 mm, tipped with a 1–2 mm recurved to reflexed spine; middle phyllaries ovate-lanceolate to lanceolate, 7–10 × 2–3 mm, apex acuminate; inner phyllaries linear to linear-lanceolate, ca. 15 × 2 mm, apex acuminate. Corolla red, ca. 1.7 cm; tube in male florets ca. 8 mm and in female florets ca. 7.5 mm. Achene yellowish, ca. 4 mm. Pappus bristles white, to 1.5 cm. Fl. and fr. Jul–Aug.

● Forests in mountain valleys, grasslands; 1400–1600 m. Xinjiang (Altay Shan).

34. CARDUUS Linnaeus, Sp. Pl. 2: 820. 1753.

飞廉属 fei lian shu
Shi Zhu (石铸 Shih Chu); Werner Greuter

Herbs, biennial or perennial. Stems with spiny wings. Leaves subentire or pinnately divided, spiny. Capitula solitary to clustered. Involucre cylindric to depressed-globose. Phyllaries imbricate. Florets bisexual. Corolla purple to red or rarely white. Stamen filaments densely pubescent; anther with short, basal appendages anther to somewhat lacerate. Style branches short. Achene narrowly obovoid to narrowly ellipsoid, 1.5–2 cm, glabrous. Phyllaries imbricate, in ca. 7 rows, lacking wings and scarious appendage; outer phyllaries triangular, ca. 5 × 1–1.5 mm, tipped with a 1–2 mm recurved to reflexed spine; middle phyllaries ovate-lanceolate to lanceolate, 7–10 × 2–3 mm, apex acuminate; inner phyllaries linear to linear-lanceolate, ca. 15 × 2 mm, apex acuminate. Corolla red, ca. 1.7 cm; tube in male florets ca. 8 mm and in female florets ca. 7.5 mm. Achene yellowish, ca. 4 mm. Pappus bristles white, to 1.5 cm. Fl. and fr. Jul–Aug.

About 95 species: tropical Africa, Asia, Europe; three species in China.

1a. Capitula solitary, ± nodding; involucre 4–7 cm in diam.; outer and middle phyllaries 4–5 mm wide, distal portion narrowed at base ........................................................................................................................................................................ 1. C. nutans

1b. Capitula clustered by 3–5 or sometimes solitary, erect; involucre 1.5–2(–2.5) cm in diam.; phyllaries to 2 mm wide, distal portion not narrowed at base.

2a. Plants dark green; leaves abaxially sometimes gray and thinly cobwebby; leaf and wing spines weak, to 3 mm ........................................................................................................................................................................ 2. C. crispus

2b. Plants light green or bluish green; leaves concolorous and hardly cobwebby; major leaf and wing spines pungent, 3–6 mm .................................................................................................................................................. 3. C. acanthoides


飞廉 fei lian

Carduus armemus Boissier; C. coloratus Tamamschjan; C. leiophyllus Petrović; C. nutans subsp. leiophyllus (Petrović) Stojanov & Stefanov; C. schischkinii Tamamschjan; C. songoricus Tamamschjan; C. thoermeri Weinmann.

Herbs 30–100 cm tall, biennial or perennial. Stems grayish...
white, usually branched, sparsely cobwebby and hirsute below, densely cobwebby-felted above; wings continuous, unequally toothed; teeth triangular, margin and apex with spines. Leaves green, concolorous, hirsute along veins or sparsely cobwebby. Lower and middle cauline leaves sessile, ovate to lanceolate, (5–)10–40 × (1.5–)3–10 cm, pinnatifid or pinnatifid-partite; segments 5–7 pairs, obliquely triangular to triangular-ovate, margin spinulose, apex with a 4–6 mm spine. Upper cauline leaves similar but gradually smaller upward, pinnately lobed or entire. Capitula 4–6, solitary at end of stem and branches, ± nodding. Involucre ± broadly campanulate, 4–7 cm in diam. Phyllaries slightly constricted at or beyond middle then expanded into a lanceolate, spiny-tipped, and patent to recurved distal portion; outer phyllaries 14–15 × 4–5 mm; middle and inner phyllaries 1.5–2 × ca. 0.5 cm; innermost phyllaries broadly linear to linear-lanceolate, 2–2.2 × 0.2–0.3 cm, not constricted. Corolla purplish red, ca. 2.5 cm, tube ca. 1.3 cm. Achene grayish yellow with pale brown strie, ca. 3.5 mm. Pappus bristles white, unequal, to 2 cm. Fl. and fr. Jun–Sep. 2n = 16, 40.

By croplands, grasslands, valleys; 500–2300 m. N Xinjiang [Kazakhstan, Mongolia, Russia; N Africa, SW Asia, Europe].

Carduus nutans is a variable species. At least fifteen subspecies have been recognized in the western, European part of its range. Carduus nutans subsp. nutans does not extend to Asia. The Chinese plants probably belong to C. nutans subsp. leiophyllus, as the synonymy indicates, but more research is needed.


5. Subtribe CENTAUREINAE
1a. Capitula homogamous; all florets bisexual.

2a. Middle phyllaries apically rounded, with a narrow hyaline margin or with a scariosus appendage.
   3a. Involucre 3–6 cm in diam., or if involucre smaller then pappus elements pinnate at apex and persistent .......................................................... 35. Rhaponticum
   3b. Involucre 1–2.5 cm in diam. and pappus elements serrulate and easily falling off .................... 41. Plagiobasis

2b. Middle phyllaries apically acute or acuminate, without an appendage or with a simple spine, spinule, or subulate tip.
   4a. Outer phyllaries leaflike or with a leaflike appendage ...................................................... 48. Carthamus
   4b. All phyllaries ± leathery and without a leaflike appendage but often apicalmost leaves approximate to capitulum.

5a. Annuals; pappus elements of two types (i.e., innermost bristle or bristles wider and longer than others).
   6a. Middle phyllaries with an apical spine; stems mostly branched from base and branches procumbent or ascending .......................................................... 36. Oligochaeta
   6b. Middle phyllaries without apical spine; stems erect and branched only in apical part ............. 42. Russowia

5b. Perennials; pappus elements all ± of one type.
   7a. Middle phyllaries 0.5–1 mm wide, subulate or narrowly ovate, apex attenuate into long subulate tip ........................................................................................................... 39. Tricholepis
   7b. Middle phyllaries 1–6 mm wide, narrowly triangular or narrowly ovate, apex with or without a short apical spine.
   7a. Stem virgately branched, terminal branches densely foliate up to capitulum ....................... 38. Archiserratula
   7b. Stem simple or branched, terminal branches sparsely foliate or leafless .................................. 37. Klasea

1b. Capitula heterogamous; outer florets female or sterile, inner florets bisexual.

9a. Outer and middle phyllaries with a fimbriate, spiny, scariosus, or hyaline appendage.
   10a. Appendage of middle phyllaries fimbriate, long decurrent almost to base; bisexual florets violet-blue ........ 49. Cyamus
   10b. Appendage of middle phyllaries fimbriate, lacerate, or entire, not or only shortly decurent; bisexual florets purple, pink, white, or yellow.
   11a. Leaves densely tomentose especially on abaxial side ............................................................ 46. Psephellus
   11b. Leaves glabrous or with various pubescence types but not densely tomentose.
   12a. Leaf blade margin argutely toothed; longitudinal striae of middle phyllaries conspicuous .......................................................... 45. Rhaponticoidea
   12b. Leaf blade margin entire, coarsely dentate, or spinose; longitudinal striae of middle phyllaries inconspicuous or lacking ........................................... 50. Centaurea

9b. Outer and middle phyllaries without an appendage but sometimes with a spine and/or hyaline margin.
   13a. Apex of middle phyllaries broadly rounded.
   14a. Pappus elements scalelike; plants annual or biennial ......................................................... 40. Amberboa
   14b. Pappus elements bristlelike; plants perennial.
   15a. Corolla pink to purplish; leaf blade undivided but margin serrate ........................................ 41. Plagiobasis
   15b. Corolla yellow to yellowish; leaf blade pinnatisect, pinnate, or bipinnatisect ............ 45. Rhaponticoide

13b. Apex of middle phyllaries acute or acuminate.
   16a. Perennials; phyllaries lanate or velvety .......................................................... 44. Serratula
   16b. Annuals; phyllaries glabrous or subglabrous.
   17a. Leaf blade margin spiny; dwarf plants less than 20 cm tall ................................................ 43. Schischkinia
   17b. Leaf blade margin serrate-dentate, not spiny; erect plants 20–60 cm tall ...................... 47. Crupina


Rhaponticum lou lu shu
Shi Zhu (石铸 Shih Chu); Ludwig Martins

Acroptilon Cassini; Klaseopsis L. Martins; Leuzea Candolle; Stemmacantha Cassini.

Herbs, perennial. Stems erect, simple or branched. Capitulum homogamous, solitary, at end of stem or branches. Phyllaries imbricate, with narrow membranous margin or apical scariosus or membranous appendage. Florets bisexual. Corolla pink to purple. Achene tetragonal or inconspicuously striate. Pappus elements in several rows, brittle, scabrid to shortly plumose; pappus elements of innermost row basally wider than and as long as or slightly longer than others.

About 26 species: Africa, Asia, Australia, Europe; four species (one endemic) in China.

*CNICUS UNIFLORUS* Linnaeus, Mant. Pl. 2: 572. 1771; *Centaurea monantha* Georgi; *Leuzea uniflora* (Linnaeus) Holub; *Rhaponticum monanthum* (Georgi) Voroschilov; *R. satzyperovii* Soksov; *R. uniflorum* subsp. *satzyperovii* (Soksov) Voroschilov; *Serratula uniflora* (Linnaeus) Poir; *Stemmacantha uniflora* (Linnaeus) Dittrich.

**Herbs 25–70 cm tall. Stems single or few, grayish white, ca. 5 mm in diam., lanate, basally clothed with remains of petioles.** Leaves grayish white, soft, arachnoid lanate. Basal and lower stem leaves petiolate; petiole 6–20(–40) cm; leaf blade elliptic, narrowly elliptic, or oblanceolate, 10–25 × 3–9 cm, pinnatifid or subpinnatisect; lateral lobes or segments 5–12 pairs, elliptic to oblanceolate, margin toothed, coarsely toothed, or entire. Middle and upper stem leaves sessile or nearly petiolate, similar in form and same in division to basal and lower stem leaves. Peduncle stout, leafless or with a few diminished leaves. Capitulum 1. Involucre 3.5–6 cm in diam. Phyllaries in (4 or)5–8 rows, appendaged; appendages brown, broadly ovate to suborbicular, 0.9–1.5 × 0.8–1.5 cm, margin lacerate; outer phyllaries ovate, ca. 5 × 3 mm excluding apical appendage; middle phyllaries elliptic to lanceolate, ca. 10 × 4 mm excluding apical appendage; inner and innermost phyllaries lanceolate, ca. 2 × 0.3 cm excluding apical appendage. Corolla 2.5–3.5 cm. Achene cuneate, ca. 4 mm, with denticulate rim at apex. Pappus elements in many rows, longest ca. 2 cm, scabrid. Fl. Apr–Jul, fr. May–Aug. 2n = 26*.

**Hills, forests, rocky slopes; 100–2700 m.** Gansu, Hebei, SW Heilongjiang, Henan, Hubei, E Jilin, Liaoning, NE Mongolia, Ningxia, E Xizang, Shanxi, Shandong, Shanxi, Sichuan [Korea, Mongolia, Russia].

The occurrence of *Rhaponticum satzyperovii* in NE China was indicated by Soksov (Fl. URSS 28: 317. 1963). It is said to differ from *R. uniflorum* by its more robust habit and its stem leaves with 4–6 pairs of ovate lobes (not 8–12 pairs of lanceolate lobes). This taxon should probably be treated as *R. uniflorum* subsp. *satzyperovii*, but the material seen is too scarce to make a decision about its taxonomic status.


*CNICUS CARTHAMOIDES* Willdenow, Sp. Pl., ed. 2, 2: 1293. 1763; *Acroptilon australis* Iljin; *A. picris* (Pallas ex Willdenow) C. A. Meyer; *A. repens* (Linnaeus) Candolle; *C. picris* Pallas ex Willdenow; *Serratula picris* (Pallas ex Willdenow) M. Bieberstein.

**Herbs 60–90 cm tall. Stems single, ca. 1 cm in diam., sparingly arachnoid.** Leaves green, sparingly arachnoid along veins and margin. Lower and middle stem leaves shortly petiolate to subsessile; leaf blade elliptic, oblanceolate, or lanceolate, 13–25 × ca. 7 cm, pinnatifid or subpinnatisect; lateral lobes or segments 5–8 pairs, lanceolate to narrowly lanceolate, margin serrate, apex attenuate-apiculate. Upper stem leaves sessile, lanceolate, decreasing in size upward, basally pinnatisect or pinnatifid with 3 or 4 pairs of lateral segments or undivided, margin toothed. Capitulum 1. Involucre 4.5–6 cm in diam. Phyllaries in 10–12 rows; outer and middle phyllaries ovate to narrowly ovate, 5–10 × 4–5 cm excluding apical appendage, apically purplish red; appendage of middle phyllaries yellowish to pale brown, ovate, broadly triangular, or subrhombic, to 7 × 7 mm, spreading to reflexed, villous; inner and innermost phyllaries lanceolate to linear-lanceolate, 15–18 × 2–3 mm excluding apical appendage; appendage of inner phyllaries brown, ovate, 6–8 × 2–5 mm, villous. Corolla ca. 2.5 cm. Achene brown, narrowly ellipsoid, ca. 7 mm, with denticulate rim at apex. Pappus elements yellowish to pale brown, longest ca. 1.8 cm, shortly plumose. Fl. and fr. Jul. 2n = 24.

**Grasslands, meadows; 2000–2700 m.** NW Xinjiang [Kazakhstan, Mongolia, Russia].

The rhizomes are used medicinally.


**Herbs 25–70 cm tall. Stems 1 or few, erect, branched from base, densely foliate, arachnoid.** Leaves sessile, elliptic, spatulate, or linear, 2–7 × 0.4–1.3 cm, pinnatifid, slightly rigid, grayish green, sparingly arachnoid to glabrescent, margin dentate or entire. Upper leaves often smaller. Capitula many, corymbose to corymbose-paniculate. Involucre ovoid to ellipsoid-ovoid, 5–13 mm in diam. Phyllaries in 6 rows; outer and middle phyllaries ovate to broadly ovate, 3–11 × 2–6 mm, appendaged, basal part green and to a large extent concealed by appendages; appendage of outer phyllaries white, membranous, glabrous, apically ciliate or villous, apex obtuse to acuminate; inner phyllaries lanceolate to linear-lanceolate, ca. 9 × 2–3 mm; appendage of inner phyllaries small, epidermally villoso-pubescent. Capitulum 1. Involucre 4.5–6 cm in diam. Phyllaries in 10–12 rows; outer and middle phyllaries ovate to narrowly ovate, 6–8 × 2–5 mm, villous. Corolla ca. 2.5 cm. Achene brown, narrowly ellipsoid, ca. 7 mm, with denticulate rim at apex. Pappus elements yellowish to pale brown, longest ca. 1.8 cm, shortly plumose. Fl. and fr. Jul. 2n = 24.

**Grasslands, meadows; 2000–2700 m.** NW Xinjiang [Kazakhstan, Mongolia, Russia].

The rhizomes are used medicinally.
lous. Corolla ca. 1.4 cm. Achene yellowish to pale brown, narrowly obovoid, 3.5–4 mm, apex rounded. Pappus elements 8–10 mm, shortly plumose at apex, easily falling off at maturity. Fl. and fr. May–Sep. 2n = 26*.

Mountain slopes, hills, waste places, farmlands, plains; 600–2600 m. Gansu, Hebei, Nei Mongol, Ningxia, Qinghai, N Shaanxi, N Shanxi, Xinjiang [Afghanistan, Kashmir, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia, Europe].


华漏芦 hua lou lu

Herbs 60–120 cm tall. Stems erect, branched or rarely unbranched, sparsely arachnoid, glabrescent, or glabrous. Leaf blade of middle stem leaves ovate, lanceolate, or narrowly lanceolate, 6–15 × 0.9–7.5 cm, scabrid, setiferous and minutely brownish yellow gland-dotted, margin dentate, denticulate, or serrate, apex acute to attenuate-acuminate. Middle stem leaves petiolate; petiole 0.5–2.5 (–4.5) cm. Upper leaves sessile or sub-sessile, similar to middle stem leaves, decreasing in size upward. Peduncle inflated below capitula. Involucre bowl-shaped, 1.5–3 cm in diam. Phyllaries in 6 or 7 rows, tinged purple, margin narrow and scarious, apex rounded to obtuse; outer phyllaries ovate to elliptic, 5–13 × 0.9–7.5 mm, adaxially glabrous, base cuneate, margin serrate and sometimes lobed near base, apex acute. Capitula few. Involucre with an entire or minutely denticulate apical rim. Pap”
1a. Leaf blade adaxially scabrous with multicellular hairs but sometimes sparsely so.

2a. Stems always simple, to 10 cm; margin of phyllaries black ........................................ 6. K. lyratifolia

2b. Stems simple or branched, (10–)15–150 cm; margin of phyllaries purplish or pale-colored.

3a. Middle phyllaries acuminate, with apical spinule 2.5–5 mm; leaf blade glandular with minute sessile glands ................................................................. 3. K. dissecta

3b. Middle phyllaries acute, with apical spinule 0.2–2 mm or without spinule; leaf blade not glandular .... 8. K. centauroides

1b. Leaf blade adaxially glabrous but margin sometimes pubescent.

4a. Leaf blade glaucous, margin entire.

5a. Involucre 1.5–3 cm in diam.; middle phyllaries with conspicuous black to dark brown area at apex .... 1. K. marginata

5b. Involucre 0.8–1.5 cm in diam.; middle phyllaries with inconspicuous brownish spot at apex ............. 2. K. cardunculus

4b. Leaf blade green, margin dentate.

6a. Stem to 15 cm, usually decumbent; involucre 1.8–2.5 cm in diam. .............................................. 5. K. procumbens

6b. Stem 15–80 cm, erect; involucre 1.1–1.7 cm in diam.

7a. Spinule of middle phyllaries to 1 mm; leaf blade leathery with paler veneration and margin white cartilaginous .................................................. 4. K. suffruticulosa

7b. Spinule of middle phyllaries (1–)3–5 mm; leaf blade herbaceous, concolorous .................................. 7. K. sogdiana


分枝麻花


Herbs 20–70 cm tall. Rhizomes ascending to procumbent. Stems solitary, erect, simple or rarely with 1 branch, base clothed with fibrous remains of petioles. Leaves glabrous or with sparse hairs, glaucous, margin often minutely ciliate. Basal leaves petiolate; leaf blade elliptic, narrowly elliptic, or ovate, tapering into petiole, 3–15 × 1.5–4 cm, margin entire, repand-crenate, or rarely pinnatifoliate. Stem leaves few, sessile, lanceolate to linear, pinnatifoliate or undivided, margin entire or toothed. Capitulum 1( or 2). Involucre campanulate to bowl-shaped, 1.5–2.5(–3) cm in diam. Phyllaries in 5–7 rows, apically dark brown to black; outer and middle phyllaries ovate-triangular, elliptic, or ovate-elliptic, 5–14 × 2–3 mm, apex acuminate and with a 1–3 mm spinule; inner and innermost phyllaries lanceolate to linear-lanceolate 10–20 × 1.5–3 mm. Corolla purple, (1.3–)1.6–2.3 cm. Achene brown, oblong, 4–6 mm. Pappus whitish, ca. 1.2 cm. Fl. and fr. Jun–Aug. 2n = 30.

Mountain steppes, hilly areas; 1500–2300 m. Gansu, Heilongjiang, Nei Mongol, Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Uzbekistan].

Herbs, perennial. Leaves pinnatilobed, pinnatifoliate, or pinnatisect, rarely undivided, rigid or soft, margin entire or toothed. Capitula homogamous, 1 or to many in a panicle, rarely compactly corymbose, solitary at end of stem and branches. Involucre globose, ovoid, hemispheric, or bowl-shaped. Phyllaries imbricate, rigid; middle phyllaries with apex acute to acuminate and often with apical spinule; inner phyllaries longest, papillose-puberulent at apex. Florets bisexual. Corolla purple to pink, rarely almost white; tube 1/3–1/2 as long as corolla. Stigmatic branches to 1(–3) mm. Achene glabrous, with a subentire apical rim. Pappus elements of one type, in several rows, whitish to yellowish brown, all ± same length or outer ones shorter, scabrid or finely barbellate.

About 45 species: N Africa, Asia, Europe; eight species in China.

All Chinese species belong to Klasea sect. Klasea.

羽裂麻花头  yu lie ma hua tou

*Serratula dissecta* Ledebour, Fl. Altaic. 4: 40. 1833; *S. angulata* Karelin & Kirilov; *S. dissecta* var. *angulata* (Karelin & Kirilov) Trautvetter.

Herbs 20–40 cm tall. Rhizomes short and thick. Stems solitary or few, erect, branched in upper part, sparsely setiferous, with fibrous remains of petioles at base. Leaves pubescent with multicellular hairs and minute sessile yellow glands. Basal and lower stem leaves long petiolate; petiole fibrous; leaf blade elliptic, 10–15 × 1.5–3.5 cm, pinnatifidpartite; lateral lobes 5–8 pairs, lanceolate, narrowly elliptic, or broadly linear, margin toothed. Middle stem leaves sessile, similar in form and same in division to basal and lower stem leaves. Upper stem leaves lanceolate, margin toothed. Capitula few to many, corymbose-paniculate. Involucre ovoid-cylindric to narrowly obconic, 5–12 mm in diam., sparsely tomentose. Phyllaries in 6 or 7 rows; outer phyllaries ovate, 3.5–6 × 1.5–2 mm, apex with a 0.5–2 mm straight to patent spinule; middle phyllaries lanceolate, ca. 10 × 2 mm, apex attenuate into a straight or spreading 2.5–5 mm spinule; inner and innermost phyllaries elliptic to broadly linear, ca. 17 × 1.5–2 mm, apex acuminate. Corolla purple, 1.5–2.2 cm. Achene grayish brown or dark brown, narrowly cuneate-ellipsoid, ca. 2.2 × 0.2–0.5 cm, apex with a scarious appendage. Corolla purple to pink, ca. 1.3 cm. Achene pale to dark brown, narrowly ellipsoid, 4–6 mm, many striate. Pappus whitish to straw-colored, ca. 8 mm. Fl. and fr. Jun–Jul.

Deserts; 1000–1500 m. NW Xinjiang [Kazakhstan].


木根麻花头  mu gen ma hua tou


Herbs (10–)15–50 cm tall. Rhizomes brown, robust, woody. Stems erect, woody at base, apically with few branches or rarely simple. Leaves rigid, leathery, glabrous or subglabrous, venation paler than rest of blade, margin toothed and white cartilaginous. Basal leaves petiolate; petiole 2.5–5 cm; leaf blade elliptic to spatulate, 4.5–9 × 1.5–5 cm, base cuneate, apex obtuse to acute. Middle cauline leaves similar to basal ones or lanceolate to oblanceolate and smaller. Upper cauline leaves smallest, linear. Capitula few or rarely 1. Involucre green to yellowish green, cylindric to ovoid-cylindric, 1.1–1.5 cm in diam., glabrous. Phyllaries imbricate, in 6–8 rows; outer phyllaries triangular-ovate to ovate, 2.5–5 × 2–3 mm; middle phyllaries elliptic, narrowly elliptic, or elliptic-lanceolate, 7–15 × 2.5–4 mm, apex acute and with a less than 1 mm spinule; inner and innermost phyllaries broadly linear to linear, 14–20 × 1.3–2 mm, apex acute and mucronate. Corolla purple, 1.5–1.9 cm. Achene brown, cuneate-ellipsoid, ca. 6 mm, striate. Pappus 6–11 mm. Fl. and fr. Jul–Aug.

Mountain slopes; ca. 1500 m. Xinjiang (Tian Shan) [Kazakhstan, Kyrgyzstan].


歪斜麻花头  wai xie ma hua tou


Herbs 7–15 cm tall. Rhizomes long, procumbent. Stems single or few, decumbent or ascending, simple or sparingly branched, glabrous. Leaves narrowly elliptic, lanceolate-elliptic, or lanceolate, leathery, inconspicuously puberulent especially on margin or glabrous. Basal and lower stem leaves shortly petiolate; leaf blade 3–7 × 0.7–2 cm, base attenuate, margin toothed; teeth with cartilaginous tip. Middle stem leaves sessile, base semiapexicaul, margin toothed below middle. Uppermost stem leaves broadly linear, margin entire. Capitula 1–3. Involucre ovoid-cylindric, 1.8–2.5 cm in diam., glabrous or subglabrous. Phyllaries in 7–9 rows; outer phyllaries triangular to ovate-lanceolate, 5–7 × ca. 3 mm, apex acute and with a straight or patent 1–2 mm spinule; middle phyllaries elliptic-lanceolate to elliptic, 9–12 × ca. 3 mm, with an apical straight or patent 1.5–2 mm spinule; inner phyllaries lanceolate, linear-lanceolate, or broadly linear, 1.6–2.2 × ca. 0.2 cm. Corolla purple to pink, ca. 2.5 cm. Achene brown, ellipsoid, ca. 6 mm. Pappus pale, ca. 1.3 cm. Fl. and fr. Jul–Sep.

Mountain slopes, ruderal areas; 2600–3600 m. SW Xinjiang [Afghanistan, Kashmir, Pakistan, Tajikistan].


无茎麻花头  wu jing ma hua tou

*Serratula lyratifolia* Schrenk ex Fischer & C. A. Meyer, Enum. Pl. Nov. 1: 45. 1841; *Klasea rugosa* (Ilijin) Kitagawa; *S. modestii* Borissova; *S. rugosa* Ilijin; *S. tianschanica* Saposhnikov & Nikitina.

Herbs, stemless or stem to 10 cm tall. Rhizome stout, oblique. Leaves petiolate; petiole 1–5 cm; leaf blade 2.5–10 × 1.5–4 cm, lirate or pinnatifidpartite, subleathery, with scattered rather large multicellular hairs on adaxial surface, margin dentilicate; lateral lobes 1–3(–5) pairs, broadly triangular, elliptic, or narrowly elliptic; terminal lobe ovate to orbicular, larger than others. Capitulum 1. Involucre bowl-shaped, 1.5–3 cm in diam., glabrous or subglabrous. Phyllaries in 6–8 rows, green with narrow black margin; outer phyllaries triangular, 5–10 × 2–6 mm, apex acute; middle phyllaries ovate to ovate-elliptic, 6–15 × 4–6 mm, apex acute and with a less than 2 mm spinule; inner phyllaries lanceolate, elliptic-lanceolate, or broadly linear, 1.4–2.2 × 0.2–0.5 cm, apex with a scarious appendage. Corolla purple, 2–2.6 cm. Achene grayish brown or dark brown, narrowly cuneate-ellipsoid, 5–6 mm. Pappus 1.5–2.2 cm. Fl. and fr. Jul–Sep. 2n = 30.

Mountain slopes; 2000–3400 m. NW Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].

The taxonomic status of *Klasea rugosa* needs clarification. It should possibly be assigned subspecific rank. It differs from typical *K. lyratifolia* by the terminal leaf segment not enlarged and by long (ca. 3 mm) stigmatic branches.

阿拉套麻花头 a la tao ma hua tou

*Serratula sogdiana* Bunge, Beitr. Fl. Russl. 191. 1852; *S. alatavica* C. A. Meyer; *S. dissecta* Ledebour var. *asperula* Regel & Herder; *S. trialvetterana* Regel & Schmalhausen.

Herbs 30–80 cm tall. Rhizomes long, woody. Stems erect, apically long virgately branched, glabrous or basally with scattered hairs. Leaves glabrous except at margin, adaxially shiny. Basal leaves petiolate; leaf blade elliptic, undivided, margin toothed. Lower and middle stem leaves lyrate pinnatifid; lobes toothed, lateral lobes sublinear to linear, terminal lobes ovate to narrowly elliptic. Upper stem leaves pinnatifid or undivided. Capitula several, solitary at end of a branch. Involucre campanulate, 1.2–1.7 cm in diam. Phyllaries tightly imbricate, in 8 or 9 rows; outer phyllaries triangular, ovate, or ovate-elliptic, 4.5–7 × 1.5–2.5 mm, apex acute and with a (1–)3–5 mm apical spine; middle phyllaries elliptic-lanceolate or narrowly lanceolate, 11–13 × 1.8–2.5 mm, apex acute and with a (1–)3–5 mm spinule; inner and innermost phyllaries oblanceolate, 11–13 × 1.8–2.5 mm, apex acuminate. Corona purple, 1.6–2 cm. Achene brown, ovoid-ellipsoid, ca. 5 mm. Pappus ca. 1 cm. late, 20–23 × 1.5–2 mm, apex acuminate. Corolla purple, 1.6–2 mm.

Mountain slopes; ca. 1400 m. NW Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].


麻花头 ma hua tou

Herbs (10–)25–150 cm tall. Stem erect, simple or branched, sparsely to densely crispat-Pubescent near base, subglabrous in upper part, base with lacerate remains of old petioles. Leaves subglabrous to scabrid; pubescence often sparse, somewhat denser toward margin and along veins, composed of small appressed (ca. 0.2 × 0.03 mm) and larger patent (ca. 1 × 0.1 mm) multicellular hairs. Basal and lower stem leaves petiolate. Upper leaves sessile. Capitula 1 to many. Involucre 0.6–3 cm in diam. Phyllaries imbricate, in 4–10 rows; outer and middle phyllaries 2–11 × 1.5–5(–6) mm, without an apical spine or with a 0.2–2 mm spinule. Corolla purple to pink, rarely almost white, 2–3 cm. Achene brown to pale brown, cuneate-ellipsoid to obliquely cuneate, 4.5–6 mm, faintly ribbed. Pappus 7–11 mm. Fl. and fr. Jul–Sep. 2n = 30, 60.

Mountain slopes, ca. 1400 m. NW Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].

8a. *Klasea centauroides* subsp. *centauroides*

麻花头(原亚种) ma hua tou (yuán yà zhòng)

*Serratula centauroides* Linnaeus, Sp. Pl. 2: 820. 1753; *Klasea centauroides* var. *albiflora* Y. B. Chang; *K. centauroides* var. *yamatsutana* (Kitagawa) Kitagawa; *K. mongolicola* (Kitagawa) Kitagawa; *K. ortholepis* (Kitagawa) Kitagawa; *S. mongolicola* Kitagawa; *S. ortholepis* Kitagawa; *S. polycephala* Iljin var. *ortholepis* (Kitagawa) Y. Ling ex H. C. Fu; *S. yamatsutana* Kitagawa; *S. yamatsutana* var. *mongolicola* (Kitagawa) Kitagawa.

Herbs (10–)25–80 cm tall. Rhizomes prostrate. Stem unbranched or sparingly branched in upper part. Petiole of basal

8b. *subsp. polycephala*

1. Stem much branched; capitula (3–)10–60; involucre 0.6–1.2 cm in diam. ........................................... 8b. *subsp. polycephala*.

1b. Stem simple or sparingly branched; capitula 1–6(–12); involucre 1.1–3 cm in diam.

2a. All leaves undivided .............  8e. *subsp. cupuliformis*

2b. At least middle stem leaves pinnatisect or pinnatifid.

3a. Involucre obconic to bowl-shaped; inner phyllaries straight, without clear distinction between basal part and scarios appendage; middle phyllaries yellowish green with pale margin ........  8f. *subsp. komarovi*

3b. Involucre semiglobose, ovoid, or campanulate; inner phyllaries mostly geniculate between basal part and appendage; middle phyllaries with dark tip and/or purple scarios margins.

4a. Involucre base shortly attenuate; middle phyllaries 1.8–3 mm wide; lateral segments of middle stem leaves usually antrorse at an acute angle ..........  8c. *subsp. centauroides*

4b. Involucre base rounded or slightly umbilicate; middle phyllaries 2.5–6 mm wide; lateral segments of middle stem leaves usually at right angle or nearly so.

5a. Stem ± foliate throughout; peduncles 1–12(–18) cm; involucre not or slightly constricted, 1.1–2.2 cm in diam. ..........  8d. *subsp. strangulata*

5b. Stem ± leafless in upper part; peduncles (10–)15–40 cm; involucre conspicuously constricted, (1.5–)2–3 cm in diam. ............  8d. *subsp. strangulata*
and lower stem leaves 2–10 cm; leaf blade elliptic to narrowly elliptic in outline, 5–12(–16) × 2–5(–8) cm, pinnatipartite; lateral lobes 5–8 pairs, narrowly elliptic to broadly linear, margin entire or few toothed, apex acute. Middle stem leaves sessile or very shortly petiolate, similar in form and same in division to basal and lower stem leaves; lateral segments usually at right angle or nearly so. Upper stem leaves smaller than others. Peduncles 1–12(–18) cm. Capitula 1–4(–12). Involucre ovoid to narrowly ovoid, 1.1–2.2 cm in diam., base rounded or slightly umbilicate, apically ± constricted. Phyllaries loosely imbricate, in 6–8 rows; outer and middle phyllaries triangular, triangular-ovate, or ovate-lanceolate, 4–15 × 2.5–4 mm, leathery, greenish, darker toward apex and purple at margin, apex acute and with a 0.5–2 mm spinule; inner and innermost phyllaries narrowly elliptic or linear, 10–20 × 1–2 mm, transitioning into appendage; appendage straw-colored or purple-tinted, linear to linear-lanceolate, slightly bent outward or almost straight, margin slightly revolute or plane. Fl. and fr. Jun–Sep. 2n = 30, 60.

Mountain slopes, steppes, meadows, sandy hills; 800–1700 m. Hebei, Heilongjiang, Liaoning, Nei Mongol, Shandong [Mongolia, Russia].


多花麻花头 duo hua ma hua tou


Herbs 30–80 cm tall. Rhizomes stout. Stem branched in upper part. Petiole of basal and lower stem leaves 1.5–4 cm; leaf blade oblanceolate, elliptic-lanceolate, or elliptic in outline, 5–15 × 2.5–5 cm, pinnatipartite or pinnatilobate; lateral lobes 5–9 pairs, broadly elliptic, triangular, or narrowly elliptic, margin entire or toothed, apex acute to acuminate. Middle and upper stem leaves sessile, pinnatipartite; lateral lobes usually at right angle or nearly so, narrowly elliptic to broadly linear, margin entire or few toothed, apex acute. Uppermost leaves linear to subulate or with 1–3 pairs of lateral segments. Capitula (3–)10–60, corymbose. Involucre narrowly ovoid, 6–12 mm in diam. Phyllaries imbricate, in 6–8 rows; outer and middle phyllaries greenish with darker tip, ovate, ovate-triangular, or elliptic-lanceolate, 3–11 × 2–3 mm, acute and with 0.2–0.8 mm apical spine; inner phyllaries linear, ca. 16 × 1–2 mm, transitioning into appendage; appendage straw-colored or purple-tinted, slightly bent outward or almost straight, linear to linear-lanceolate, with slightly revolute or plane margins. Fl. and fr. Jul–Sep.

Mountain slopes, roadsides, farmlands; 600–2000 m. Hebei, Liaoning, Nei Mongol, Shanxi.


北麻花头 bei ma hua tou


Herbs 0.5–1.5 m tall. Rhizomes prostrate. Stems unbranched or sparingly branched in upper part. Petiole of basal and lower stem leaves 3–9 cm; leaf blade elliptic in outline, 8–20 × 3–10 cm, pinnatipartite or rarely undivided; lateral lobes 4–8 pairs, narrowly elliptic to broadly linear, margin entire or few toothed, apex acute. Middle stem leaves sessile or very shortly petiolate, similar in form and same in division to basal and lower stem leaves; lateral segments usually falcate or anthemose at an acute angle. Upper stem leaves smaller than others, linear or with 1–3 pairs of lateral segments. Peduncles (8–)12–30 cm, leafless or with 1 or few linear diminished leaves. Capitula 1–6(–9). Involucre campanulate or ovoid-campanulate, 1.1–1.5(–1.7) cm in diam., constricted, base shortly attenuate. Phyllaries tightly imbricate, in 7–10 rows; outer and middle phyllaries triangular, triangular-ovate, or ovate-lanceolate, 3–10 × 1.8–3 mm, leathery, greenish, often darker toward apex and purple at margin, apex acute and with a 0.5–1.5 mm apical spine; inner and innermost phyllaries narrowly elliptic to linear, 10–20 × 1–2.5 mm, transitioning into appendage; appendage straw-colored or purple-tinted, linear to linear-lanceolate, bent outward, margin slightly revolute. Fl. and fr. Jul–Oct.

Mountain slopes, steppes, meadows; 200–1800 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Shanxi, Shanxi [Korea, Russia].


緞包麻花头 yi bao ma hua tou


Herbs 40–100 cm tall. Rhizomes procumbent. Stem unbranched or sparingly branched from middle and branches erect. Petiole of basal and lower stem leaves 4–10 cm; leaf blade elliptic, oblanceolate-elliptic, or oblanceolate in outline, 10–20 × 3–7 cm, lyrate pinnatifid or pinnatipartite, rarely undivided; lateral lobes 3–7 pairs, elliptic to triangular, margin toothed, few toothed, or entire. Middle stem leaves sessile, similar in form and same in division as basal and lower stem leaves; lateral segments usually at right angle or nearly so, narrowly triangular, linear-triangular, or lanceolate, 0.5–1.5 cm wide, margin entire or distantly toothed. Upper stem leaves linear, margin entire. Peduncles (10–)15–40 cm. Capitula 1 or few. Involucre hemispheric, (1.5–)2–3 cm in diam., conspicuously constricted, base rounded. Phyllaries imbricate, in 7 or 8 rows; outer and middle phyllaries yellowish, blackish green striate toward apex, dark purple at margin, ovate, ovate-lanceolate, or elliptic, 6–13 × 3–5(–6) mm, leathery, apex acute and with a ca. 1 mm apical spine; inner and innermost phyllaries elliptic to linear, 14–22 × 2–5 mm, transitioning into appendage; appendage straw-colored, linear to linear-lanceolate, bent outward, margin slightly revolute. Fl. and fr. Jun–Sep.

Mountain slopes, grasslands, riverbanks, farmlands; 1300–3500 m. S Gansu, W Henan, Nei Mongol, Ningxia, Qinghai, S Shaanxi, Shanxi, N Sichuan.

钟苞麻花头 zhong bao ma hua tou


Herbs 40–100 cm tall. Rhizome robust. Stem unbranched or sparingly branched in upper part. Petiole of basal and lower stem leaves 1–6 cm; leaf blade narrowly elliptic, oblanceolate, or elliptic, 8–20 × 2–7 cm, base attenuate, margin coarsely toothed to biserate, apex acuminate. Middle stem leaves lyrately pinnatilobed or undivided. Upper stem leaves similar to lower and middle stem leaves, oblanceolate, or linear, smaller than other leaves. Peduncles 2–24 cm. Capitula usually 1, rarely to 4 in robust individuals. Involucre hemispheric to ovoid, (1.3–)1.8–2.5 cm in diam., constricted. Phyllaries in 7 or 8 rows; outer and middle phyllaries yellowish, blackish green striate toward apex, dark purple at margin, ovate to lanceolate, 2.5–9 × 2–3.5 mm, leathery, apex acute and with a 0.3–1 mm apical spinule; inner phyllaries lanceolate, linear-lanceolate, or narrowly linear, 9–11 × 1.5–3 mm, transitioning into appendage; appendage straw-colored, linear to linear-lanceolate, bent outward, margin slightly revolute. Fl. and fr. Jul–Oct.

● Grasslands on mountain slopes, open forests; 900–2400 m. Hebei, Henan, Liaoning, Shanxi.


碗苞麻花头 wan bao ma hua tou


Herbs (15–)30–90 cm tall. Rhizome short. Stems solitary or few, branched in upper part, rarely unbranched. Petiole of basal and lower stem leaves 2–9 cm; leaf blade elliptic, oblanceolate, or oblanceolate-elliptic in outline, pinnatifid, pinnatipartite, lyrately pinnatilobed, or lyrately pinnatipartite, 6–20 × 3–7 cm; lateral lobes 6–10 pairs, margin few toothed or entire. Middle leaves sessile, similar in form and same in division as basal and lower stem leaves. Upper stem leaves broadly linear to linear or with 3–5 pairs of lateral segments, margin entire. Peduncles 1–22 cm. Capitula (1–)3–6(–12), inconspicuously corymbose. Involucre obconic to bowl-shaped, 1.8–2.5 cm in diam. Phyllaries loosely imbricate, in 4–6 rows; outer and middle phyllaries yellowish green, paler at margin, triangular, narrowly triangular, linear-lanceolate, or elliptic-lanceolate, 2–10 × 1.5–3.5 mm, apex acute and without an apical spine or with a ca. 0.5 mm spine; inner phyllaries linear-lanceolate to linear, 10–18 × 1–2.5 mm, straight, plane, without distinction between basal part and appendage. Fl. and fr. May–Sep.

● Grasslands on mountain slopes, forests, wastelands, farmlands, watersides; 200–2100 m. Anhui, Hebei, Henan, Shandong, Shanxi.


滇麻花头属 dian ma hua tou shu

Shi Zhu (石铸 Shih Chu); Ludwig Martins


Subshrubs or perennial herbs. Stems virgately branched, foliate throughout. Leaves undivided, with reticulate resin ducts. Capitula solitary at end of branches, homogamous. Phyllaries imbricate, apex acute or apiculate. Receptacle cylindric to obconic. Florets bisexual. Stigmatic branches divergent, canaliculate. Achene ellipsoid-cylindric, smooth, glabrous, apex with a denticulate rim. Pappus elements in many rows, bristlelike, not coninate into a ring, pinnate at least in their distal part.

● One species: China.


滇麻花头 dian ma hua tou


Herbs or subshrubs, 0.7–1.5 m tall. Stems sometimes purplish red, erect, long virgately branched, woody at base, leafy, glabrous or subglabrous. Leaves subsessile, lanceolate to linear-lanceolate, glabrous, with resin ducts along veins visible on abaxial side, base cuneate, margin denticulate, apex acute. Lower and middle stem leaves 2.5–10 × 0.3–2 cm. Upper stem leaves similar to lower and middle stem leaves, decreasing in size upward. Capitula several to many. Involucre cylindric to narrowly obconic, 6–10 mm in diam. Phyllaries imbricate, in 7 or 8 rows, green to yellowish green, sometimes slightly purple tinged; outer and middle phyllaries triangular, ovate-triangular, ovate, or lanceolate, 2–14 × 1–3 mm, apex acute or acuminate; inner phyllaries linear-lanceolate, ca. 18 × 1.5–2 mm, densely puberulent near apex. Corolla pale purple, 1.9–2.2 cm. Achene ellipsoid-cylindric, 7.9–5.5 mm. Pappus elements light brown, ca. 1.2 cm, finely serrulate, pinnate toward apex. Fl. and fr. Aug–Nov.

● Grasslands on mountain slopes, rock crevices; 1300–2000 m. NW Yunnan.

镇苞菊属 zhen bao ju shu
Shi Zhu (石铸 Shih Chu); Ludwig Martins

Stictophyllum Edgeworth.

Herbs or subshrubs, annual or perennial. Stem erect, branched from base or middle. Lower stem leaves pinnately divided or entire. Capitula homogamous, several, solitary at end of stem and branches. Involucre campanulate to hemispheric. Phyllaries subulate to subulate-lanceolate, very narrow, unappendaged or with an awnlike appendage. Florets bisexual. Corolla purple, pink, yellow, or whitish. Stigmatic branches divergent. Achene with a denticulate rim at apex. Pappus elements in many rows or absent; outer pappus elements shortly plumose, scabrid, or serrulate, distinct or basally connate into a ring; inner pappus elements scarcely longer and basally wider, flattened.

About 17 species: Asia; three species in China.

There is one specimen of Tricholepis roylei J. D. Hooker from “Tibet.” However, this is probably erroneous or is from a locality outside of China but referred to as “Tibet” in a historical sense. This species is only known from Himachal Pradesh, India, and it is very unlikely to occur in China.

1a. Involucre 0.9–1.5 cm in diam.; middle and upper leaves linear or nearly so, to 0.2 cm wide ................................. 3. T. tibetica
1b. Involucre 1.5–6 cm in diam.; middle and upper leaves lanceolate or narrowly lanceolate, 0.3–3 cm wide.

1a. Capitula not subtended by leaves; peduncles slender, ca. 1 mm in diam.; phyllaries flexuous or bent outward .... 1. T. furcata
1b. Capitula subtended by uppermost leaf or leaves; peduncles stout, ca. 2 mm in diam.; phyllaries straight .......... 2. T. karensium

1. Tricholepis furcata Candolle, Prodr. 6: 563. 1838.

镇苞菊 zhen bao ju

Herbs 0.6–1.4 m tall, perennial. Stem branched from base or middle, stem and branches puberulent, glabrous or sparsely pubescent. Lower stem leaves shortly petiolate; leaf blade elliptic to lanceolate, 5–12 × 3–5 cm, scabrid, yellowish gland-dotted, base cuneate, margin serrate, apex acute to acuminate. Phyllaries imbricately appressed, in many rows, lanceolate-subulate, very narrow, unappendaged or with an awnlike appendage. Corolla yellow, ca. 2 cm; lobes glabrous.

1. Involucre ovoid, 0.9–1.5 cm in diam., base truncate. Phyllaries in many rows, subulate and slightly broader at base, 10–50 × 0.5–1 mm, straight, sparsely ciliate or glabrous near base, densely ciliate at apex. Corolla yellow or nearly so, to 2.1 cm; lobes appressed puberulent toward apex. Achene oblong, base oblique, apex slightly curved. Pappus elements multi-seriate, filiform, 1–1.5 cm, shortly ciliate. Fl. Jun–Oct.


3. Tricholepis tibetica J. D. Hooker & Thomson ex C. B. Clarke, Compos. Ind. 241. 1876.

红花镇苞菊 hong hua zhen bao ju

Herbs or subshrubs, 25–60 cm tall, perennial. Stems virgately branched, sparsely pubescent or glabrous, floccose lanate at base; branches slender. Leaves glabrous, glabrescent, or sparsely tomentose, somewhat fleshy. Lower leaves oblong, 2–6 × 0.2–0.5 cm, margin dentate to pinnatifid; lobes few, distant. Upper leaves oblong to linear, 5–15 × ca. 1 mm, margin entire. Peduncles ca. 1 mm in diam. Capitula erect or almost so. Involucre ovoid, 0.9–1.5 cm in diam., base truncate to obtuse. Phyllaries imbricately appressed, in many rows, lanceolate-subulate, 2–12 × 0.5–1 mm, apex acuminate with tip somewhat deflexed; outer and middle phyllaries glabrous or slightly tomentose; inner phyllaries appressed pubescent toward apex. Corolla pink, 1.3–1.6 cm, glabrous; lobes glabrous. Achene brown, oblong, smooth. Pappus elements white, decreasing in length outward, scabrid; innermost pappus elements 12–13 × 0.2–0.3 mm, flattened.

Dry rocky slopes. Xizang [Afghanistan, Kashmir, Pakistan].

No material from China was seen by the present authors, and the description here is based on the original publication and specimens from Kashmir.

About 17 species: Asia; three species in China.

Herbs, annual or biennial. Stem erect, branched or unbranched. Leaves undivided, lyrate, or pinnatifid, margin entire or toothed. Capitula heterogamous, solitary at end of stem and branches, sometimes additionally 1 or few subbasal. Involucrre glabrous or sparsely arachnoid. Phyllaries imbricate, rigid to subrigid; middle phyllaries broadly rounded; inner phyllaries with scarious apical appendage. Outer florets in 1 row, sterile, with corollas 5–20-cleft; inner florets many, bisexual, in many rows. Corolla yellow or purple. Stigmatic branches long. Achene sericeous-villous, apex with denticulate rim; attachment scar surrounded by conspicuously thickened rim. Pappus elements of one type, scalelike, wider toward apex, scabridulous, rarely absent.

Seven species: C and SW Asia; two species (one introduced) in China.

1a. Corolla yellow; corolla of radiant florets 5–10-cleft; usually at least 1 subbasal capitulum present .................................. 1. Amberboa turanica

1b. Corolla purplish red or white; corolla of radiant florets 10–20-cleft; all capitula terminal on long peduncles .......... 2. Amberboa moschata


Herbs 15–35 cm tall, annual. Main stem very short, usually surmounted by side branches; stem and branches floccose. Leaves glabrous. Basal and lower stem leaves petiolate; petiole to 4.5 cm; leaf blade elliptic to lanceolate, undivided, margin dentilicate to almost entire, 4–6 × 1.2–2.5 cm. Middle and upper stem leaves sessile or shortly petiolate, pinnatifid or pinnatifid; lateral lobes 3 or 4 pairs, lanceolate, margin sparsely toothed or entire. Involucrre ovoid, bowl-shaped, or hemispheric, 1–1.7 cm in diam. Phyllaries in ca. 4 rows, lanate-pubescent, glabrescent; outer phyllaries broadly ovate to ovate-elliptic, 4–7 × 4–6 mm, apex obtuse-rounded; middle phyllaries elliptic, 8–12 × ca. 6 mm; inner phyllaries spathulate-elliptic to broadly linear, ca. 12 × 2–4 mm, with triangular to lanceolate apical appendage. Corolla yellow to yellowish; corolla of marginal florets scarcely longer than disk florets, 5–10-cleft, white pubescent at middle. Achene dark brown, cylindric, ca. 5 mm, densely white villous. Pappus ca. 4 mm. Fl. and fr. May–Sep. 2n = 64.

Sandy areas, wastelands, farmlands; ca. 400 m. Xinjiang (Junggar Pendi) [Afghanistan, Kazakhstan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].


Herbs 30–50 cm tall, annual or biennial. Stem solitary, branched or unbranched; stem and branches sparsely cobwebby floccose. Leaves glabrous or sparsely floccose. Lower stem leaves petiolate; leaf blade spatulate to elliptic, 6–7 × 1.5–2 cm, base attenuate, margin serrulate, apex obtuse to acute. Middle and upper stem leaves shortly petiolate; leaf blade elliptic to narrowly elliptic, lyrate pinnatifid. Uppermost leaves sessile or subsessile, margin serrulate. Involucrre ovoid, 1.2–2 cm in diam. Phyllaries in 3 or 4 rows, sparsely villous; outer phyllaries ovate, ca. 4 × 1.8 mm; middle phyllaries ovate to broadly ovate, 5–10 × 3–7 mm; inner phyllaries spathulate-elliptic to broadly linear, ca. 10 × 3–4 mm, with ovate to orbicular apical appendage. Corolla purple, 10–20-cleft, white villous; corolla of marginal florets much longer than inner ones. Achene brown, cylindric, ca. 5 mm, densely white villous. Pappus ca. 5 mm, rarely absent. 2n = 32.

Naturalized in Gansu [native to SW Asia].

*Amberboa moschata* is also grown as a garden ornamental.


Herbs, perennial. Stem branched. Capitula heterogamous, rarely homogamous. Phyllaries imbricate, broadly rounded. Outer florets female or sterile; inner florets bisexual; rarely all florets bisexual. Corolla pink to purple. Stigmatic branches long, divergent. Achene ellipsoid-cylindric, without a rim; attachment scar without a thickened margin. Pappus elements in many rows, bristlelike, not connate into a ring.

One species: China, Kazakhstan, Kyrgyzstan.


Herbs 20–60(–80) cm tall. Stem erect, sparsely branched above middle, striate, glabrous. Leaves thick, glabrous, margin sharply toothed. Basal leaves petiolate; petiole 2–5 cm; leaf blade elliptic to obovate, 4–6 × 1.5–2 cm, base attenuate, apex obtuse to acute. Stem leaves sessile, oblong to lanceolate, base...
cuneate to rounded and sometimes semiamplexicaul, apex acute. Capitula few, corymbose to laxly paniculate. Involucre globose to ovate, 1–2.5 cm in diam. Phyllaries in 4 or 5 rows, green to yellow-green, leathery, apex sometimes with purple tinge or with dark triangular or semilunar spot; outer and middle phyllaries suborbicular, ovate, or oblong, 5–15 × 4–7 mm, with a narrow faintly delimited membranous margin, apex rounded; inner and innermost phyllaries elliptic to linear-lanceolate, 15–20 × 1.5–5 mm, apically hyaline to scarious, apex obtuse. Corolla 1.6–2 cm. Achene brown, narrowly ellipsoid-cylindric, 5–6 × 1–1.5 mm, sparsely pubescent and early glabrescent, not ribbed, apex rounded. Pappus elements white, 5–7 mm, serrulate, easily falling off. Fl. and fr. Jul–Oct.


纹苞菊属 wen bao ju shu

Shi Zhu (石铸 Shih Chu); Ludwig Martins

Herbs, annual. Stem richly branched, glabrous. Leaves pinnatisect. Capitula homogamous, at end of stem and branches, laxly paniculate to corymbose-paniculate. Phyllaries imbricate, in ca. 4 rows, without appendage. Florets bisexual. Corolla pale pink to white, 1–5 mm. Capitula few to many congested at end of a branch. Involucre cylindric to ovoid-cylindric, 3–8 mm in diam. Phyllaries green with purple tinge, 3- or 5-striate, apex obtuse; outer and middle phyllaries ovate to elliptic, 2–3.5 × 2 cm, margin narrow and membranous; inner and innermost phyllaries elliptic-lanceolate to elliptic-oblanceolate, 6–10 × 2–2.5 mm. Florets few. Corolla ca. 1 cm, sparsely villous above middle. Achene yellowish brown, narrowly ellipsoid, 3.5–4 mm, sparsely white sericeous. Pappus elements white, 5–7 mm, serrulate. Fl. and fr. Jun–Oct.

Deserts; 800–1000 m. Xinjiang (Junggar Pendi, Tian Shan) [Afghanistan, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan].


白刺菊属 bai ci ju shu

Shi Zhu (石铸 Shih Chu); Ludwig Martins

Herbs, dwarf, annual. Stem branched from base. Leaves undivided, margin with rigid white spines. Uppermost leaves conical capitula. Capitula heterogamous, clustered. Phyllaries imbricate, herbaceous. Receptacle with setae few, rather short. Florets few; outer florets sterile; inner florets bisexual. Corolla yellow or pink, of even thickness, not divided into tube and limb. Style branches short. Achene with a denticulate rim at apex. Pappus elements of two types; outer pappus of scabrid bristles; inner pappus of an annulus bearing 1 rigid basally widened bristle.

One species: Afghanistan, China, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan; SW Asia.


白刺菊 bai ci ju


Herbs, annual. Stem very short; stem and branches white, puberulent. Leaves shortly petiolate; leaf blade elliptic, oblanceolate, linear-oblanceolate, or spatulate, 2–6 × 0.3–0.7–(1.5) cm, glabrous or abaxially sparsely short-striose, base cuneate-attenuate, apex acute; marginal spines simple or 2–6-digitate, white, 1–5 mm. Capitula few to many congested at end of a branch. Involucre narrowly ovoid-ellipsoid, 12–14 × 4–5 mm. Phyllaries in ca. 5 rows, glabrous, apex acuminate and tipped with a short spine; outer phyllaries ovate, 5–6 × 2–3 mm; middle phyllaries elliptic to elliptic-lanceolate, 8–10 × 2–3 mm; inner phyllaries elliptic to linear, ca. 12 × 1.5 mm, scarios, apex often purple tinged. Corolla yellow or pink, 5–6 mm. Achene pale, ellipsoid-obovoid, compressed, ca. 4 × 2 mm, glabrous, shiny; lateral attachment scar almost 1/2 as long as achene; apical rim regularly denticate. Pappus absent in sterile florets; pappus elements of fertile florets white but inner ones darker at base; outer pappus bristelike, to 7 mm; inner pappus a single bristle, 8–9 cm, ca. 0.5 mm wide at base. Fl. and fr. Jun.

Sandy areas; ca. 600 m. Xinjiang (Junggar Pendi) [Afghanistan, Kazakhstan, Pakistan, Tajikistan, Uzbekistan; SW Asia].
**44. SERRATULA** Linnaeus, Sp. Pl. 2: 816. 1753.

伪泥胡菜属 wei ni hu cai shu
Shi Zhu (石铸 Shih Chu); Ludwig Martins

*Mastruchium* Cassini.

Herbs, perennial. Stems erect, usually branched in upper half. Leaves pinnatisect or pinnate, rarely undivided, margin dentate or serrate. Capitula heterogamous [or homogamous and plants gymnodioecious], few to many, paniculate or corymbose. Involucre ovoid, hemispheric, or bowl-shaped. Phyllaries usually darker toward apex, imbricate, apex acute; inner phyllaries longest. Marginal florets female, scarcely longer than bisexual ones, with staminodes. Corolla purple to pink. Stigmatic branches slender. Achene glabrous, apex rounded. Pappus elements of one type, in several rows, finely serrulate or scabrid.

Two species: Asia, Europe; one species in China.


伪泥胡菜 wei ni hu cai

*Mastruchium pinnatifidum* Cassini ex Candolle; *Serratula coronata* var. *manshurica* (Kitagawa) Kitagawa; *S. manshurica* Kitagawa.

Herbs 0.6–1.5 m tall. Rhizomes stout, procumbent. Stems erect, apically branched, rarely unbranched, glabrous. Basal and lower stem leaves petiolate, strigose to glabrescent; petiole 5–16 cm; leaf blade oblong to elliptic in outline, to 40 × 12 cm, pinnatisect or pinnate; segments narrowly elliptic, margin dentate or serrate; lateral segments 3–8 pairs, asymmetrical, decurrent on rachis. Middle and upper stem leaves sessile, similar in form and same in division as basal and lower stem leaves but smaller. Capitula heterogamous, few or rarely 1. Involucre bowl-shaped to campanulate, 1.2–2.5 cm in diam., with brownish lanate to velvety pubescence, rarely glabrescent. Phyllaries imbricate, in 6 or 7 rows, abaxially purplish red; outer phyllaries triangular to ovate, 3–7 × 1.5–4 mm, apex acute and with a spine; middle and inner phyllaries elliptic, narrowly elliptic, or lanceolate, 10–18 × 3–4 mm, apex acuminate to acute; innermost phyllaries linear, ca. 20 × 1 mm. Corolla purple, 2–2.8 cm in female florets, ca. 2 cm in bisexual florets. Achene oblong-lanceolate-ellipsoid, ca. 7 mm, many striate. Pappus elements yellowish brown, to ca. 1.2 cm, scabrid. Fl. and fr. Jul–Oct. 2n = 22.

Forests, forest margins on mountain slopes, steppes, meadows, riverbanks; 100–1600 m. Anhui, SE Gansu, Guizhou, Hebei, Heilongjiang, Henan, NW Hubei, Jiangxi, Jilin, Liaoning, Nei Mongol, S Shaanxi, E Shandong, Shanxi, N Xinjiang [Japan, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Russia; Europe].


欧亚矢车菊属 ou ya shi che ju shu
Shi Zhu (石铸 Shih Chu); Ludwig Martins

*Bielzia* Schur.

Herbs, perennial. Rhizome woody. Stem usually solitary, glabrous, covered with ± lanate remains of old leaves at base. Leaves pinnate, pinnatisect, or bipinnatisect, glabrous, margin argutely toothed; teeth white cartilaginous at apex; leaf segments usually strongly asymmetric at base, decurrent on rachis. Capitula heterogamous, solitary at end of stem and branches. Phyllaries broadly ovate, glabrous, base rounded. Corolla yellow or sulfureous; corolla of marginal florets not or scarcely radiant, sterile, with staminodes. Achene brown, yellowish brown near base, blackish near apex. Pappus elements of two types; outer pappus elements in many rows, bristelike, scabrid; inner pappus elements in 1 row, scalelike, much shorter than to almost as long as outer ones, sometimes excurrent into a longer bristle.

About 30 species: N Africa, C and SW Asia; three species in China.

1a. Middle phyllaries with very narrow (ca. 0.2 mm wide) inconspicuous hyaline margin, without apical appendage ................................................................. 1. *R. ruthenica*

1b. Middle phyllaries appendaged or with more than 1 mm wide hyaline margin.

2a. Primary segments of lower leaves undivided, oblong to narrowly elliptic ......................................................... 2. *R. kasakorum*

2b. Primary segments of lower leaves irregularly pinnatipartite to pinnatisect ..................................................... 3. *R. dschungarica*


欧亚矢车菊 ou ya shi che ju

*Centaurea ruthenica* Lamarck, Encycl. 1: 663. 1785; *C. modestii* Fedorov; *Centaurium ruthenicum* (Lamarck) Cassini.

Herbs 40–110 cm tall. Stem usually solitary, erect, apically few branched. Leaves green. Basal and lower stem leaves petiolar; petiole 4–9 cm, lanate; leaf blade oblanccolate in outline, pinnatisect to pinnate, ca. 18 × 8 cm; lateral segments 8–14 pairs. Middle and upper stem leaves sessile, similar in shape and same in division to basal and lower stem leaves, decreasing in size upward; lateral segments 4–10 pairs, elliptic to linear; basal lateral segments much diminished. Capitula few to several, rarely 1. Involucrre ovoid, 1.8–2.5 cm in diam. Phyllaries in
4–6 rows, apex obtuse to rounded; middle phyllaries elliptic to ovate-elliptic, 9–10 × ca. 5 mm, unappendaged, margin ca. 0.2 mm wide and hyaline; inner phyllaries elliptic-lanceolate to lanceolate, 14–18 × 3–5 mm, apical appendage brownish and scarious. Achene narrowly ellipsoid, ca. 7 mm, apically rugulose. Outer pappus elements ca. 4 mm; inner pappus elements 0.8–3.5 mm. Fl. and fr. Jul–Sep. 2n = 30.

Mountain slopes, meadows; 1200–1900 m. Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Uzbekistan; SW Asia, Europe].


天山矢车菊 天山矢车菊


Herbs ca. 30 cm tall. Stem usually solitary, erect, apically few branched or unbranched. Leaves green or grayish green. Basal leaves petiolate; petiole to 13 cm; leaf blade elliptic to oblanceolate, 14–22 × 5–8 cm, pinnatisect to pinate; lateral segments 6–12 pairs, oblong to narrowly elliptic, sometimes with 1 or 2 accessory segments near base; terminal segment elliptic, equal to lateral segments or smaller. Stem leaves several, sessile or shortly petiolate, similar to basal leaves but smaller. Capitula few to several, rarely 1. Involucre ovoid to campanulate, ca. 1.5 cm in diam. Phyllaries in 5 or 6 rows, apex obtuse to rounded; middle phyllaries elliptic to ovate-elliptic, 7–12 × ca. 5 mm, unappendaged, margin ca. 1 mm wide, hyaline, and often lacerate; inner phyllaries elliptic-lanceolate to lanceolate, ca. 15 × 3 mm, apical appendage white, hyaline, and scarious. Achene 6–8 mm. Outer pappus elements to 7 mm; inner pappus elements short. Fl. and fr. May–Aug.

Mountain slopes; ca. 2300 m. Xinjiang (Xinyuan) [Kazakhstan, Russia].

3. Rhaponticoides dschungarica (C. Shih) L. Martins, comb. nov.

准噶尔矢车菊 准噶尔矢车菊


Herbs 40–80 cm tall. Stem usually solitary, erect, apically few branched or unbranched. Leaves green. Basal leaves petiolate; petiole 2.5–6 cm, lanate at base; leaf blade oblongate, elliptic, or obovate in outline, 10–15 × 6–7 cm, bipinnatisect or pinate and lateral segments irregularly pinnatifid to pinnatisect; primary segments ca. 10 pairs, lanceolate to obliquely lanceolate, decreasing in size toward apex; ultimate segment narrowly elliptic. Stem leaves sessile or shortly petiolate, similar in shape and same in division as basal leaves. Capitula few to several, rarely 1. Involucre ovoid to bowl-shaped, 1.2–2.5 cm in diam. Phyllaries in 5 or 6 rows; middle phyllaries elliptic to ovate-elliptic, 7–12 × ca. 6 mm, apical appendage white hyaline to scarious, 2–5 mm, and narrowly decurrent on phyllary; inner phyllaries elliptic-lanceolate to linear-lanceolate, 15–16 × 3–6 mm, gradually transitioning into a scarious white or pale brown appendage. Achene 6–7 mm. Outer pappus elements to 6 mm; inner pappus elements very short. Fl. and fr. Jul–Aug.

Mountain slopes; 1600–2000 m. Xinjiang (Tian Shan) [Kyrgyzstan].

Centaurea ruthenica Lamarr var. bipinnatifida Trautvetter, described from Kazakhstan, is possibly a synonym of Rhaponticoides dschungarica.


矮小矢车菊属 矮小矢车菊属

Shi Zhu (石铸 Shi Chu); Ludwig Martins

Herbs, perennial. Leaves tomentose, not decurrent. Capitula heterogamous, solitary at end of stem and branches. Phyllaries with apical appendage; appendage not or shortly decurrent, scarious, not spiny. Marginal florets sterile, radiant, with minute staminodes enclosed in corolla tube. Style branches of bisexual florets connate, divergent only in uppermost part. Achene narrowly ovoid, sparsely pilose. Pappus elements indistinctly of two types, shorter than achene; outer pappus elements in several rows, scabrid; inner pappus elements similar to outer ones, but somewhat wider and shorter than innermost row of outer pappus elements.

About 75 species: C and SW Asia, Europe, Russia; one species in China.


矮小矢车菊 矮小矢车菊


Herbs 5–15(–30) cm tall. Stems 2 or 3, grayish white, erect or procumbent, simple or with 1 or 2 branches, tomentose to villous. Leaves grayish white, densely tomentose especially on abaxial side. Basal leaves petiolate; leaf blade elliptic, ca. 5 × 2–3 cm, pinnatisect; lateral segments 2–5 pairs, elliptic to ovate, margin entire; terminal segment ovate, larger than lateral segments. Stem leaves few, similar to basal leaves or undivided, narrowly elliptic to spatulate, margin entire. Capitulum 1 or 2.

Involute campanulate to obconic, 1–2 cm in diam. Phyllaries in ca. 6 rows, appendage yellowish brown; outer phyllaries triangular to lanceolate, arachnoid; middle phyllaries ovate, narrowly ovate to lanceolate, 4–10 × ca. 3 mm, glabrous; appendage of middle phyllaries broadly ovate, elliptic, or suborbicular, scarious, with 4–12 filmbriae on each side; inner phyllaries linear-lanceolate, ca. 11 × 1.5–2 mm; appendage of inner phyllaries suborbicular to spoon-shaped, lacerate. Outer florets ster-
ile, radiant, longer than inner florets. Corolla purple to pink. Achene whitish, obliquely oblong, ca. 6 mm, with an entire apical rim. Outer pappus elements in several rows, bristlelike, to ca. 2 mm, scabrid to serrulate; inner pappus elements bristlelike to narrowly scalelike, ca. 1.5 mm, scabrid. Fl. and fr. Jul–Aug. 

\[ 2n = 30. \]

Dry mountain slopes; ca. 1200 m. N Xinjiang [Kazakhstan, Russia].


半毛菊属 ban mao ju shu

Shi Zhu (石铸 Shih Chu); Ludwig Martins


Herbs, annual. Stem slender, erect, apically corymbose to paniculately branched. Leaves unarmed. Basal leaves simple. Stem leaves pinnatisect to pinnate. Capitula heterogamous. Phyllaries imbricate. Florets few; outer florets sterile or functionally male; inner florets 1 to few and bisexual. Achene dark brown, subcylindric to compressed, villous toward apex, apex truncate and with a rim. Pappus elements of two types; outer pappus elements in several rows, bristlelike, scabridulous; inner pappus elements few, in 1 row, scalelike, short.

Two or three species: N Africa, C and SW Asia, Europe; one species in China.


半毛菊 半毛菊 ban mao ju


Herbs 20–60 cm tall. Stem solitary, basally pubescent, apically glabrous. Leaves green, with few glochidiate hairs at margin and sometimes sparsely lanate pubescent on adaxial side of rachis. Basal leaves soon decaying, sessile, obovate, scabrid, margin entire or toothed, apex obtuse. Stem leaves sessile; lateral segments 3–5 pairs, linear to broadly linear, 1.4–4 mm wide, margin entire or sparsely minutely denticulate. Capitula 3–6(–15), laxly corymbose. Involucre at anthesis fusiform to narrowly ellipsoid and 4–6 mm in diam., expanding in fruit to obconic and 7–12 mm in diam. Phyllaries pale green sometimes with purple tinge, in ca. 6 rows, herbaceous, striate, margin narrowly white scarious, apex acute; outer phyllaries broadly ovate to elliptic, 1.5–2.1 mm; middle and inner phyllaries elliptic-lanceolate, 5–11 × 1.5–2.5 mm. Corolla purple, filiform, ca. 1.1 cm, pubescent with richly branched hairs. Achene subcylindric, 3–5 mm, base rounded, villous toward apex; attachment scar basal, suborbicular. Outer pappus elements to ca. 6 mm, very unequal, scabridulous; inner pappus elements 5 or 6(–12), very short. Fl. and fr. Jul. 

\[ 2n = 30. \]

Slopes; ca. 1100 m. NW Xinjiang (Ili Kazak Zizhizhou) [Afghanistan, India, Kashmir, Kazakhstan, Kyrgyzstan, Russia, Tajikistan, Turkmenistan, Uzbekistan; Africa, SW Asia, Europe].

*Crupina vulgaris* is naturalized in North America.


红花属 hong hua shu

Shi Zhu (石铸 Shih Chu); Ludwig Martins

*Kentrophyllum* Necker ex Candolle.

Herbs, annual or perennial. Leaves pinnatilobed, pinnatisect, or undivided, margin usually spiny. Capitula homogamous, 1 to several at end of stem and branches. Involucre ovoid or narrowly ellipsoid. Outer phyllaries leaflike, rigid, spinosely toothed; inner phyllaries thin, sometimes with apical appendages. Florets bisexual. Stigmatic branches short. Achene ivory, ovoid, oblanceolate, or obpyramidal, 4-angled, glabrous, usually rugose toward apex, apex with a rim; outer achenes often without pappus; inner achenes usually with a persistent or connate and deciduous pappus. Pappus elements in many rows or absent.

About 47 species: C and SW Asia, Europe, Mediterranean region; one species (introduced) in China.

*Carthamus lanatus* Linnaeus is cultivated as an ornamental in the Beijing area and Shaanxi.


红花 hong hua

Herbs (20–)50–100(–150) cm tall, annual. Stem erect, apically branched; stem and branches white or whitish, smooth, glabrous. Leaves rigid, leathery, glabrous. Lower and middle stem leaves sessile, lanceolate, ovate-lanceolate, or elliptic, simple, 7–15 × 2.5–6 cm, base attenuate and semiaplexicaul, margin spinosely toothed or entire, apex acute; teeth very rarely pinnatisect, apically with 1–1.5 mm spinules. Upper stem leaves lanceolate, decreasing in size upward, margin spinosely toothed; teeth apically with a ca. 3 mm spine. Capitula few to many, in a corymbose synflorescence, rarely 1. Involucre ovoid, ca. 2.5 cm in diam. Phyllaries in ca. 5 rows; outer phyllaries leaflike, ovate-lanceolate, 2–4 × ca. 1 cm, spiny; middle phyl-
laries 6–20 × 4–7 mm, constricted between pale parallel-veined basal part and leaflike apical part with green reticulate veins; inner phyllaries oblanceolate-elliptic to oblong-lanceolate, ca. 22 × 5 mm, rigidly scarious, apex attenuate. Corolla red to orange, ca. 2.8 cm. Achene ovoid to ellipsoid, ca. 5.5 mm, 4-angled. Pappus absent. Fl. and fr. May–Aug. 2n = 24*.

Widely cultivated in China and occasionally naturalized in saline and alkaline soils in dry and cold conditions in Gansu, Guizhou, Hebei, Heilongjiang, Jiangsu, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Xizang, Zhejiang [native origin unknown; widely cultivated].

The seeds of Carthamus tinctorius yield edible oil, and the florets are used medicinally or for extracting a red pigment used as dye. Because of its long cultivation, the precise origin is uncertain although it is probably SW Asia.


蓝花矢车菊属 lan hua shi che ju shu

Shi Zhu (石铸 Shih Chu); Ludwig Martins

Herbs, annual [or perennial]. Leaves arachnoid tomentose, often decurrent on stem. Capitula heterogamous, at end of stem and branches. Involucre ovoid. Phyllary appendages long decurrent, margin ciliate or dentate. Florets usually blue, rarely white, cream-colored, pink, or purple; marginal florets sterile, usually without staminodes, radiant, much enlarged. Achene pilose; attachment scar with a tuft of hairs at base. Pappus elements of two types; inner pappus elements similar to outer ones but distinctly shorter than innermost row of outer pappus elements.

About 25–30 species: SW Asia, Europe, Mediterranean region; one species (introduced) in China.

1. Cyanus segetum Hill, Veg. Syst. 4: 29. 1762.

蓝花矢车菊 lan hua shi che ju


Herbs 30–70 cm tall, annual or rarely biennial. Stem erect, branched from middle, rarely unbranched; stem and branches grayish white, thinly arachnoid floccose. Leaves abaxially grayish white and sparsely arachnoid, adaxially green to grayish green and sparsely arachnoid. Basal and lower stem leaves petiolate; leaf blade narrowly elliptic-oblancoate to lanceolate, undivided or lyrate pinnatisect; lateral segments 1–3 pairs, narrowly elliptic-lanceolate, linear-lanceolate, or linear, margin entire; terminal segment narrowly elliptic-oblancoate, margin serrulate. Middle stem leaves sessile, broadly linear to linear-lanceolate, rarely with lateral laciniae near base, 4–9 × 0.3–0.8 cm, base attenuate, margin entire, apex acute. Upper stem leaves similar in shape to middle stem leaves, decreasing in size upward. Capitula few to many, corymbose or paniculate. Involucre ellipsoid, 5–13 mm in diam., sparsely arachnoid. Phyllaries in ca. 6 rows, appendaged; appendage brownish or white, scarious, fimbriate; outer and middle phyllaries elliptic to narrowly elliptic, 3–6 × 2–4 mm; inner phyllaries elliptic, 10–11 × 3–4 mm. Outer florets blue, white, red, or purple, longer than inner florets; inner florets bluish violet. Achene ellipsoid, ca. 3 mm, striate, sparsely pilose-pubescent. Pappus elements in several rows, scabrid; outer pappus elements bristlelike, 2–3 mm; inner pappus elements bristlelike to narrowly scalelike, 1–2 mm. Fl and fr. Feb–Aug. 2n = 24, 48*.

Occasionally naturalized in at least Qinghai and Xinjiang [native to Europe].

Cyanus segetum is widely grown in China as an ornamental. The whole plant is used medicinally, and the seed oil can be used for soap making.


矢车菊属 shi che ju shu

Shi Zhu (石铸 Shih Chu); Ludwig Martins

Calcitrapa Vaillant; Centaurea sect. Hyalaea Candolle; Chartolepis Cassini; Cnicus Linnaeus, nom. cons.; Hyalea Jaubert & Spach; Jacea Miller.

Herbs, annual, biennial, or perennial. Leaves concolorous. Capitula heterogamous, 1 to numerous or paniculate-corymbose or paniculate-racemose. Involucre globose, ovoid, campanulate, or bowl-shaped. Phyllaries imbricate; apical appendage fimbriate, spiny, or scarios. Florets few to many; outer florets sterile, enlarged and radiant or ± as long as inner ones, without staminodes; inner florets bisexual. Corolla yellow, white, pink, or purple. Stigmatic branches short. Achene sparsely pubescent to glabrous, apical rim denticulate or smooth. Pappus usually present, of two types of elements; outer pappus elements bristlelike, usually in many rows, rarely in 1 row, persistent or caducous, scabrid; inner pappus elements short, usually scalelike.

About 300–450 species: most in C and SW Asia and Mediterranean region; seven species (one introduced) in China.

All of the native species in China occur in Xinjiang. Centaurea nigrescens Willdenow, native to Europe, is grown as a garden plant at the Summer Palace in Beijing.

1a. Capitula concealed by uppermost leaves; uppermost leaves large ................................................................. 1. C. benedicta

1b. Capitula visible; uppermost leaves diminished.

1. Cyanus segetum
2a. Appendage of middle phyllaries unarmed, hyaline, margin entire or slightly lacerate.
3a. Involucre 12–18 mm in diam.; stem leaves decurrent ................................................................. 2. C. glastifolia
3b. Involucre 4–6 mm in diam.; stem leaves sessile ................................................................. 3. C. pulchella

2b. Appendage of middle phyllaries fimbriate or spiny.
4a. Appendage of middle phyllaries fimbriate, blackish ................................................................. 4. C. scabiosa
4b. Appendage of middle phyllaries spiny, pale.
   5a. Terminal spine of middle phyllaries straight, (3–)10–25 mm ......................................................... 7. C. iberica
   5b. Terminal spine of middle phyllaries arcuate, 1–4 mm.
       6a. Bisexual florets 3–7; pappus present .......................................................................................... 5. C. virgata
       6b. Bisexual florets ca. 12; pappus absent ...................................................................................... 6. C. diffusa


Cnicus benedictus Linnaeus, Sp. Pl. 2: 826. 1753.

Herbs 5–50 cm tall, annual. Stem erect, usually divaricately branched; stem and branches densely setiferous. Leaves setiferous pubescent with multicellular hairs, pinnatilobed or pinnatifid, prominently reticulate-veined especially on abaxial side, margin spinose to spinosely toothed. Basal leaves petiolate; leaf blade oblong, ca. 30 × 8 cm, runcinate to pinnatifid, often withered at anthesis. Lower and middle stem leaves petiolate; petiole winged; leaf blade narrowly elliptic, decreasing in size upward, pinnatifid or pinnatipartite, base attenuate; lobes triangular, narrowly elliptic-triangular, or narrowly elliptic. Upper stem leaves sessile, base amplexical and shortly decurrent onto stem. Uppermost leaves exceeding capitula. Capitula few to several, rarely 1, solitary at end of stem and branches, concealed by subtending leaves. Involucral ovoid, ca. 2 cm in diam. Phyllaries imbricate, in 4 or 5 rows; outer phyllaries ovate, ca. 10 × 5 mm, leaflike, apex acute and tipped with a 3–6 mm spine; middle phyllaries elliptic, elliptic-lanceolate, or lanceolate, ca. 15 × 3–6 mm, apex with a rigid pectinately divided spine; inner phyllaries broadly linear, ca. 20 × 2.5 mm. Sterile florets filiform. Corolla pale yellow. Achene cylindrical, ca. 8 mm, conspicuously many ribbed, glabrous, apex with a denticle rim. Outer pappus elements in 1 row, ca. 1 cm, rigid, scabridulous; inner pappus elements much shorter, ciliate to inconspicuously arachnoid. Fl. and fr. Jun–Aug.

Mountain slopes; ca. 2300 m. Xinjiang (Tian Shan) [Afghanistan, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; N Africa, SW Asia, Europe].

Centaurea benedicta is native to N Africa, C and SW Asia, and Europe but has become naturalized in other areas.

This species is cultivated in Chinese gardens. The whole plant is used medicinally.

2. Centaurea glastifolia Linnaeus subsp. intermedia (Boissier) L. Martins, comb. et stat. nov.

薄鳞菊 bao lin ju


Herbs 40–100 cm tall, perennial. Stem erect, winged, sparingly branched. Leaves shortly strigose and gland-dotted, margin entire or inconspicuously serrulate. Basal leaves petiolate; petiole 4–20 cm; leaf blade elliptic to elliptic-oblanceolate, 6–10 × 2–6 cm. Lower stem leaves similar to basal leaves, base decurrent. Middle and upper stem leaves narrowly elliptic, elliptic-lanceolate, or linear-elliptic, decreasing in size upward, base long decurrent. Capitula few to several, in a laxly racemose-corymbose synflorescence. Involucral narrowly ellipsoid to ovoid, 1.2–1.8 cm in diam. Phyllaries in 5 or 7 rows, with an apical membranous appendage; outer and middle phyllaries ovate, 4–10 × 2.5–5 mm; appendage of outer and middle phyllaries ovate-lanceolate, ca. 5 mm wide, white hyaline except for a pale brown triangular area at base; inner phyllaries ovate-lanceolate, much longer than others. Corolla yellow, ca. 2.7 cm; corolla of outer florets 4- or 5-cleft, as long as or slightly shorter than inner ones. Achene ellipsoid, 5–6 mm, sparsely pilose. Outer pappus elements in many rows, bristly-like, to 1 cm, shortly plumose; inner pappus elements scale-like, oblong, very short. Fl. and fr. Jun–Aug.

Lakesides, thickets; ca. 800 m. Xinjiang (Junggar Pendi) [Kazakhstan, Russia; Europe].


琉苞菊 liu bao ju

Hyalea pulchella (Ledebour) K. Koch.

Herbs (10–)20–70 cm tall, annual. Stem erect, branched, pubescent near base; branches ivory-white or straw-colored, ascending, slender, glabrous. Leaves arachnoid, glabrescent. Basal leaves withered at anthesis, shortly petiolate; leaf blade narrowly elliptic-lanceolate, margin repandly denticulate and sometimes pinnatifid near base. Lower and middle stem leaves sessile, lanceolate to linear-lanceolate, 2–3 × 0.2–0.3 cm, base cuneate-attenuate, margin entire or minutely serrulate, apex acute. Upper stem leaves similar to lower and middle stem leaves, decreasing in size upward. Capitula many, in a corymbose to panicle-like synflorescence. Involucral narrowly ellipsoid to obconic, 4–6 mm in diam. Phyllaries in ca. 6 rows, glabrous, with distinct blackish longitudinal line; outer and middle phyllaries ovate to narrowly ovate, 1–5 × 0.7–1.5 mm excluding appendage; appendage of outer and middle phyllaries with a median brown stripe, spoon-shaped, suborbicular, or ovate, hyaline, decurrent on margin of phyllary, margin entire or slightly lacerate, almost completely concealing herbaceous part of phyllaries; inner phyllaries linear-lanceolate to linear, ca. 10 × 1.5 mm excluding appendage. Sterile florets not radiant. Corolla pink or white, ca. 1 cm, of even thickness. Achene obvoid, ca. 3 mm, sparsely pilose to glabrescent, with a shallowly denticulate rim. Outer pappus elements white, to 5 mm, scabridulous; inner pappus elements scale-like, 1–1.5 mm, ciliate and with a tuft of hairs at apex. Fl. and fr. Jun–Sep.

Herbs 50–100 cm tall, perennial. Stems solitary or few, erect, branched above middle; stem and branches sparsely floc-cose or arachnoid pubescent. Leaves scabrid, sparsely arachnoid. Basal leaves petiolate; petiole brown, fibrous, 5–8 cm; leaf blade oblanceolate to elliptic in outline, 15–20 × ca. 8 cm, pinnatisect; lateral segments 8–11 pairs, narrowly elliptic, broadly linear, narrowly oblanceolate, or spatulate, margin entire; terminal segment usually larger than lateral segments, margin entire or sometimes toothed. Stem leaves similar to basal leaves, decreasing in size upward; lower stem leaves shortly petiolate. Capitula few to many, corymbose or corymbose-pauciflorous at end of stem and branches. Involucr e ovoid to campanulate, 1.2–2 cm in diam. Phyllaries imbricate, in 6 or 7 rows, appended; outer and middle phyllaries broadly to narrowly ovate, 4–13 × 3–5 mm, abaxially arachnoid, somewhat glabrescent; appendage of outer and middle phyllaries brown to blackish brown, small, fimbriate, narrowly decurrent on margin of phyllary; apex acute; inner phyllaries broadly linear, ca. 15 × 3 mm; appendage of inner phyllaries brown, scarios, fimbriate. Sterile florets as long as or slightly longer than bisexual ones. Corolla purple. Achenes pale brown, elliptic, 4–7 mm, sparsely pubescent, with a subentire rim at apex. Outer pappus elements in several rows, bristlelike, to 6 mm, scabrid to s eellate; inner pappus elements scalelike, ca. 1 mm. Fl. and fr. Jun–Sep. 2n = 20.

Deserts, steppes, flooded lands, farmlands; 400–1400 m. Nei Mongol, N Xinjiang [Kazakhstan, Kyrgyzstan, Russia, Uzbekistan].


小花矢车菊 xiao hua shi che ju


Herbs 25–70 cm tall, perennial. Stems few to several, erect, branched from above middle; branches spreading, rigid; stem and branches grayish green, arachnoid tomentose. Leaves densely minutely gland-dotted, arachnoid tomentose. Basal and lower stem leaves petiolate; petiole 3–7 cm; leaf blade elliptic in outline, 5–8 × 2–4 cm, pinnatipartite to bipinnatipartite; ultimate segments linear to narrowly elliptic, 0.7–3 mm wide. Middle stem leaves sessile, pinnatipartite. Upper leaves diminished, undivided. Capitula many, laxly and broadly paniculate, solitary or in pairs, easily detaching from peduncle after anthesis. Involucre ovoid, ellipsoid-ovoid, or cylindric, 2.5–3.5 mm in diam.

Phyllaries in 6 rows; outer and middle phyllaries elliptic, narrowly elliptic, or linear-lanceolate, 2–8 × 1–1.8 mm, puberulent; appendage of outer and middle phyllaries straw-colored or with a purple tinge, with 4–8 pectinately arranged 1–1.8 mm spines on each side ending in a 1–2 mm arcuate-recurved spine; inner phyllaries linear-lanceolate, ca. 8 × 1.5 mm; appendage of inner phyllaries triangular to subulate, scarious. Sterile florets few, as long as bisexual ones, not or scarcely radiant; bisexual florets 3–7. Corolla purple to pink. Achenes grayish, ovoid, 3–3.5 mm, pilose to subglabrous, apex with an almost smooth inconspicuous ring. Outer pappus elements in few rows, longest ca. 2 mm, scabridulous; inner pappus elements ca. 0.7 mm. Fl. and fr. Jun–Sep. 2n = 36.

Mountain slopes, wastelands; 500–1500 m. Xinjiang (Tian Shan) [Afghanistan, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia, Europe].


铺散矢车菊 pu san shi che ju

Herbs 15–50 cm tall, biennial. Stems erect or diffuse, branched from base; stem and branches densely strigose and sparsely arachnoid. Leaves adaxially scabrous. Basal and lower stem leaves petiolate; leaf blade bipinnatisect. Middle stem leaves sessile. Upper leaves sessile, linear, margin entire. Capitula numerous, paniculate at end of stem and branches. Involucre ovoid-cylindric to cylindric, 3–5 mm in diam. Phyllaries in 5 or 6 rows; outer and middle phyllaries lanceolate to elliptic, 3–7 × ca. 1.5 mm; appendage of outer and middle phyllaries straw-colored, with 1–5 pectinately arranged spines on each side ending in a 2–4 mm arcuate-patent spine; inner phyllaries linear, ca. 8 × 1 mm; appendage of inner phyllaries scarious. Sterile florets few, as long as bisexual ones, not radiant; bisexual florets ca. 12. Corolla white. Achene dark brown with paler stripes, narrowly ovoid, ca. 2 mm, sparsely pilose, apex with a minute inconspicuous smooth apical rim. Pappus absent. Fl. and fr. Sep. 2n = 18, 36.

Collected from Liaoning (Lüshun) but of unknown status as to being cultivated, escaped, or naturalized [native to SW Asia and Europe].


镇刺矢车菊 zhen ci shi che ju

Caletrapa iberica (Treviranus ex Sprengel) Schur.

Herbs 20–100 cm tall, annual or biennial. Stem erect, d ivariately branched; stem and branches sparsely setiferous; branches exceeding main axis. Leaves sparsely strigose and gland-dotted. Basal leaves petiolate; leaf blade lyrate pinnatipartite or lyrate-pinnatisect. Middle stem leaves sessile, pinnatipartite or pinnatisect; lateral lobes or segments ca. 4 pairs, narrowly elliptic, oblanceolate, or linear-oblanceolate, margin inconspicuously denticulate, apex rounded, obtuse, acute, or mucronulate. Upper leaves decreasing in size upward, narrowly elliptic, lanceolate, oblanceolate, or elliptic-oblanceolate, margin denticulate or entire. Capitula in a corymbose-paniculate synflorescence. Involucre ovoid, 1–1.8 cm in diam. excluding spines. Phyllaries in 4–6 rows; outer and middle phyllaries
ovate, broadly ovate, or ovate-elliptic, 5–7 × 4–8 mm, with scarious margin and an apical spine; spine of outer and middle phyllaries straw-colored, (0.3–)1–2.5 cm, patent, sulcate, with 1 or 2 pairs of small accessory spines at base, apex pungent; inner phyllaries narrowly to broadly linear, 10–15 × 3–6 mm; appendage of inner phyllaries white or pale brown, scarious, margin entire or irregularly and coarsely dentate. Sterile florets not exceeding bisexual ones. Corolla pink to purple. Achene grayish brown, ellipsoid, 3–4 mm, sparsely pubescent, apex subentire with an inconspicuous rim. Outer pappus elements in few rows, white, bristlelike, to 2 mm, scabrid; inner pappus elements scalelike, ca. 0.5 mm. Fl. and fr. Jun–Sep. 2n = 20.

Mountain slopes; 500–900 m. NW Xinjiang [Afghanistan, Kashmir, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia, Europe].
3. Tribe CARLINEAE

刺苞菊族  ci bao ju zu

Shi Zhu (石铸 Shih Chu); Werner Greuter

Herbs, biennial or perennial. Leaves alternate, rarely all basal. Capitula homogamous, bisexual, rarely unisexual in dioecious plants, persistent, solitary or several at end of stem and branches. Involucre surrounded by spiny ± divided bracts dissimilar from phyllaries. Phyllaries imbricate, undivided. Receptacle with scales and sometimes bristles, rarely naked. Florets numerous. Corolla actinomorphic, 5-lobed. Stamen filaments glabrous; anther sagittate, base caudate; connective with a sterile apical appendage. Style branches coherent, short, ± truncate. Achene covered with dense long straight appressed hairs, lacking apical rim surrounding pappus insertion. Pappus elements of one or two types of plumose or scabrid bristles, inserted directly on upper edge of achene, not surrounded by a rim.

Five genera and ca. 70 species: N Africa, Asia, Europe; three genera and six species (two endemic) in China.


刺苞菊  ci bao ju

*Carlina longifolia* Reichenbach (1830), not Viviani (1824); *C. vulgaris* Linnaeus var. *longifolia* Grabowski; *C. vulgaris* var. *microcephala* Ledebour.

Herbs 20–120 cm tall, biennial. Stem solitary, apically branched, weakly cobwebby. Basal leaves long petiolate. Cauline leaves sessile, undivided, green, concolorous or abaxially paler, lanceolate to linear-lanceolate, 4–15 × 0.5–2 cm, ± thickly papery, glabrous or abaxially sparsely cobwebby, margin with spines alternating with distinct groups of stouter spines. Uppermost cauline leaves grading into bracts. Bracts very numerous, surrounding capitulum; outer bracts similar to leaves, green, cobwebby; inner bracts gradually smaller upward, brown or dark purple, progressively reduced to bipinnate spines. Capitula 1 to several, corymbose. Involucre hemispheric-obconic, 3.5–4.5 cm in diam. Phyllaries linear, margin entire; outer phyllaries few, completely hidden by bracts, abaxially densely sericeous cobwebby, margins long interwoven ciliate, distal portion purplish, apex acuminate; inner phyllaries much longer, much exceeding florets, abaxially sparsely cobwebby, margin proximally appressed ciliate, distal portion adaxially yellow, scarious, spreading hygroscopically and showy when dry. Corolla purple, 7–9 mm. Achene oblong, 2–4 mm. Pappus bristles connate to varying lengths in groups of 2–4, all basally united into a ring. Fl. and fr. Jun–Sep. 2n = 20.

Dry meadows, thickets, river terraces; ca. 1000 m. N Xinjiang (Burqin) [Kazakhstan, Russia; Europe].

12. ATRACTYLODES Candolle, Prodr. 7: 48. 1838.

苍术属  cang shu shu

Giraldia Baroni.

Herbs, perennial, rhizomatous. Rhizome with homomorphic adventitious roots. Leaves undivided to pinnatipartite, margin spinulose or with spine-tipped teeth. Bracts (except outermost leaflike ones) pectinately pinnatisect to pinnatifid. Receptacle flat or concave, densely covered with linear scales. Florets bisexual. Achene obovoid to ovoid, compressed, apex truncate. Pappus bristles in 1 row, plumose, all of one type, basally connate into a ring.

About six species: E Asia; four species (two endemic) in China.

1a. Cauline leaves sessile.
2a. Cauline leaves undivided; corolla white, ca. 0.8 cm .......................................................... 1. A. koreana
2b. Cauline leaves pinnately lobed or pinnatifid with 6–9 pairs of segments; corolla yellow, ca. 1.3 cm .......... 3. A. carlinoides
1b. Cauline leaves petiolate.
3a. Corolla white or yellow, to 1.3 cm .................................................................................. 2. A. lancea
3b. Corolla purplish red, ca. 1.7 cm .................................................................................. 4. A. macrocephala

朝鲜苍白术


Herbs 25–50 cm tall. Rhizome long, stout. Stems solitary or tufted, unbranched or apically branched, glabrous. Leaves ± thickly papery, green, subconcolorous, glabrous, undivided, apex acuminate to subacute. Basal and lowermost cauline leaves withered at anthesis. Lower and middle cauline leaves ± narrowly elliptic to ovate-lanceolate, 3.5–10 × 2–4 cm, base rounded and semiamplexicaul. Upper cauline leaves similar but smaller. Capitula 1 to several. Involucre campanulate to oblong-campanulate, ca. 1 cm in diam. Phyllaries imbricate, abaxially glabrous, apex obtuse to rounded; outer phyllaries ovate, 2–4 × 1–2 mm; middle phyllaries gradually longer; innermost phyllaries elliptic to linear, 11–12 × 2–4 mm. Corolla white or yellowish, 0.9–1.2 cm. Achene obovoid, ca. 5 mm, hairs white. Pappus brown to dirty white, 7–9 mm. Fl. and fr. Jun–Oct.

Grasslands, forests, thickets, rock crevices; 200–2500 m. Anhui, Chongqing, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Zhejiang [Japan, Korea, Russia].

Atractylodes lancea is widely cultivated throughout China. The rhizomes are used medicinally.

苍白术

Atractylis lancea Thunberg in Murray, Syst. Veg., ed. 14, 729. 1784; Acarna chinensis Bunge; Atractylis chinensis (Bunge) Candolle; A. chinensis var. liaotungensis Kitagawa; A. chinensis var. loesneri Kitagawa; A. japonica (Koidzumi) Kitagawa; A. ovata Thunberg; A. ovata f. pinnatifolia Komarov; A. ovata var. simplicifolia Loesener; A. ovata f. ternata Komarov; A. pinnatifolia (Komarov) S. Y. Hu; A. separata L. H. Bailey; Atractylodes chinensis (Bunge) Koidzumi; A. erosodontata Koidzumi; A. japonica Koidzumi; A. lancea var. simplicifolia (Loesener) Kitamura; A. lyvata Siebold & Zuccarini; A. ovata (Thunberg) Candolle; A. ovata var. ternata (Komarov) Koidzumi; Giraldia stapfii Baroni.

Herbs (15–)30–100 cm tall. Rhizome thick, horizontal or ascending. Stems solitary or tufted, unbranched or apically few branched, ± glabrous. Leaves ± rigidly papery, green, concolorous, glabrous or abaxially sparsely cobwebby. Basal leaves withered at anthesis. Lower and middle cauline leaves petiolate but lower ones sometimes subsessile; petiole 0.5–8 cm; leaf blade 8–12 × 5–8 cm, undivided or divided almost to base into 3–5(–9) pinnately arranged segments; segments undivided or sometimes near base with few small spiny lobes, ± narrowly elliptic to oblongo-lanceolate or obovate, 3–9 × 2–6 cm, base cuneate, apex shortly acuminate to rounded. Upper cauline leaves similar but smaller. Outer bracts numer-ous, homomorphic, reduced to pectinately arranged pinnate spines, exceeding but not completely hiding involucre. Involucrate campanulate, 1–1.5 cm in diam. Phyllaries numerous, imbricate, margin cobwebby, apex rounded to obtuse; outer phyllaries ovate, 3–6 × 1–3 mm; middle phyllaries gradually longer; innermost phyllaries elliptic to linear, 11–12 × 2–4 mm. Corolla white or yellowish, 0.9–1.2 cm. Achene obovoid, ca. 5 mm, hairs white. Pappus brown to dirty white, 7–9 mm. Fl. and fr. Sep.–Oct.

Grasslands, forests, thickets, rock crevices; 200–2500 m. Anhui, Chongqing, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shanxi, Zhejiang [Japan, Korea, Russia].

Atractylodes lancea is widely cultivated throughout China. The rhizomes are used medicinally.


鄂西苍白术
e xi cang shu


Herbs 30–50 cm tall. Rhizome horizontal. Stem solitary, usually purplish red, unbranched. Leaves papery, green, concolorous, glabrous. Basal leaves rosulate, petiolate; leaf blade elliptic to oblongo-lanceolate, 15–21 × 3–4 cm, pinnately lobed or pinnatifid; segments triangular; lateral segments 6–9 pairs; terminal segment largest. Cauline leaves several, sessile, elliptic to lanceolate, 5–12 × 1–3 cm, pinnately lobed to pinnatifidpartite, apex with a long spine. Bracts pinnatipartite. Capitula 1 or 2. Involucre campanulate, 2.5–3 cm in diam. Phyllaries few, imbricate; outer phyllaries ± narrowly elliptic, 7–11 × 3–4 mm; middle phyllaries gradually longer; innermost phyllaries linear to broadly linear, ca. 21 × 3 mm. Corolla yellow, ca. 1.3 cm. Achene obovoid, ca. 6 mm. Pappus white, 7–8 mm. Fl. and fr. Sep.

● Slopes; ca. 1600 m. W Hubei (Zigui).

白术

Atractylis macrocephala (Koidzumi) Nemoto (1936), not Desfontaines (1799); A. macrocephala var. hunanensis Y. Ling.

Herbs 20–60 cm tall. Rhizome thick. Stem branched from base, glabrous. Leaves papery, glabrous. Middle cauline leaves petiolate; petiole 3–6 cm; leaf blade divided almost to base into 3–5 segments; terminal segment largest. Upper cauline leaves similar but smaller. Outer bracts

CARLINEAE
sessile, elliptic to narrowly elliptic, margin entire; inner bracts pinnatisect. Capitula 6–10. Involucre broadly campanulate, 3–4 cm in diam. Phyllaries numerous, imbricate, margin white cobwebby, apex obtuse; outer phyllaries ovate to triangular, 6–8 × 3–4 mm; innermost phyllaries lanceolate to broadly linear, 11–20 × 2–3 mm. Corolla purplish red, ca. 1.7 cm. Achene obconic, ca. 7.5 mm, hairs white. Pappus dirty white, ca. 1.7 cm. Fl. and fr. Aug–Oct. 2n = 24*.

- Grasslands, forests; 600–2800 m. W Anhui, Chongqing, N Fujian, Guizhou, Hunan, W Jiangxi, Zhejiang.

*Atractylodes macrocephala* is cultivated throughout China. The rhizomes are used medicinally.


革苞菊属  ge bao ju shu

Herbs, perennial, dioecious, stemless. Taproot crowned by a thick woody stock. Leaves all basal, tufted, petiolate; leaf blade leathery, pinnately divided; segments spiny. Flowering scapes lateral, axillary, short. Capitulum solitary, homogamous, female or functionally male. Receptacle naked. Male florets small; female florets larger, with staminodes. Anthers basally with long filiform tails. Pappus elements of two types; inner pappus of distinct scabrid bristles; outer pappus shorter, of few slender tortuous hairs.

One species: China, Mongolia.


革苞菊  ge bao ju

Woody stock 6–7 cm in diam., densely beset with persistently lanate petiole remains. Petiole 1.5–7 cm, proximal half with dense long silky indumentum; leaf blade elliptic, oblong, or ovate, 3–15 × 1–4 cm, pinnatifid to pinnately lobed, both surfaces sparsely to densely cobwebby or lanate; segments wide and short, with irregular shallow spine-tipped teeth; spines rigid, 2–4 mm. Flowering scapes solitary or few, decumbent or ascending, unbranched, leafless, 2–4 cm, densely whitish lanate. Bracts leathery, with shallow spiny lobes, abaxially cobwebby; outer bracts leaflike, not always present; inner bracts smaller, grading into phyllaries, with yellow spinules. Male capitulum ca. 1 cm; female capitulum ca. 2 cm. Involucre obconic to obovoid, ca. 1 cm in diam. Phyllaries few, imbricate, linear-lanceolate, abaxially subglabrous, margin entire and ciliate, apex spiny. Corolla whitish, 0.7–1.4 cm. Style distally thickened, in female florets smooth and with ± divergent triangular-ovate branches, in functionally male florets covered with sweeping hairs at tip; branches coherent, linear. Achene oblong, 8–10 mm, densely sericeous-villous. Pappus dirty white; inner pappus to 1.5 cm. Fl. and fr. May–Jun.

- Stony hillsides, sandy sloping fields, gravelly slopes; 800–1500 m. Nei Mongol [Mongolia].

The roots are used medicinally.

1a. Leaf blade narrowly elliptic to oblong ........................................ 1a. var. mongolica

1b. Leaf blade ovate ........................................... 1b. var. ovatifolia

1a. **Tugarinovia mongolica** var. mongolica

革苞菊(原变种)  ge bao ju (yuan bian zhong)

Leaf blade narrowly elliptic to oblong.

- Stony hillsides, sandy sloping fields; ca. 1500 m. Nei Mongol [Mongolia].


卵叶革苞菊  luan ye ge bao ju

Leaf blade ovate.

- Gravelly slopes; ca. 800 m. Nei Mongol (Ih Ju Meng).
5. Tribe CICHORIEAE

Annual to perennial, acaulescent, scapose, or caulescent herbs, more rarely subshrubs, exceptionally scandent vines, latex present. Leaves alternate, frequently rosulate. Capitulum solitary or capitula loosely to more densely aggregated, sometimes forming a secondary capitulum, ligulate, homogamous, with 3–5 to ca. 300 but mostly with a few dozen bisexual florets. Receptacle naked, or more rarely with scales or bristles. Involucre cylindric to campanulate, ± differentiated into a few imbricate outer series of phyllaries and a longer inner series, rarely uniseriate. Florets with 5-toothed ligule, pale yellow to deep orange-yellow, or of some shade of blue, including whitish or purple, rarely white; anthers basally calcarate and caudate, apical appendage elongate, smooth, filaments smooth; style slender, with long, slender branches, sweeping hairs on shaft and branches; pollen echinolophate or echinate. Achene cylindric, or fusiform to slenderly oboconoidal, usually ribbed, sometimes compressed or flattened, apically truncate, attenuate, cuspidate, or beaked, often sculptured, mostly glabrous, sometimes papillose or hairy, rarely villous, sometimes heteromorphic; pappus of scabrid [to barbellate] or plumose bristles, rarely of scales or absent.

About 95 genera and ca. 2,500 species (and at least 8,000 apomictic and hybrid taxa): chiefly in the temperate to subtropical zones of the N Hemisphere, and extending to tropical and S Africa, tropical Asia, Australia and New Zealand, and South America, also on SE Pacific and mid-Atlantic archipelagos; 35 genera (two endemic, one introduced) and 388 species (190 endemic, 12 introduced) in China.

1a. Pappus absent in all or in outer achenes, or in all achenes present but of minute (≤ 0.3 mm) scales or very short (≤ 1.5 mm) bristles.

2a. Pappus a tiny crown of fimbriate 0.1–0.3 mm scales; florets blue ............................................................... 83. Cichorium
2b. Pappus absent in all or in outer achenes, or of very short (≤ 1.5 mm) bristles; florets yellow.

3a. Achene dimorphic, outer achenes apically attenuate or shortly beaked, inner ones with a long slender beak strongly exceeding involucre; pappus in all or in inner achenes present.

4a. Outer achenes columnar, curved, with appressed hairs, apically attenuate; pappus of smooth to scabrid 0.2–1.5 mm bristles, shorter in outer, longer in inner achenes; inner phyllaries hardened in fruit .............. 70. Garhadiolus
4b. Outer achenes broadly obconical, compressed, lateral ribs strongly winglike and enlarged, shortly beaked; pappus absent in outer achenes, mostly present and of 3–5 mm bristles in inner ones; inner phyllaries not hardened in fruit ......................................................... 69. Heteracia

5b. Achene homomorph, never beaked; pappus in all achenes absent.

6a. Pappus white, of numerous fine cottony outer bristles intermixed with some thicker inner ones .......................... 63. Sonchus
6b. Pappus bristles never plumose, all smooth to scabrid.

7a. Plumose bristles stiffly fimbriately plumose, fimbriae not intertwining; florets yellow or white; leaves never grasslike.

8a. Receptacle with linear scarious scales ± as long as involucre and enclosing base of florets; stem, leaves, and involucre with rigid simple hairs ................................................................................... 81. Hypochaeris
8b. Receptacle naked; stem, leaves, and involucre with simple and 2-hooked hairs .................................................. 82. Picris

7b. Plumose bristles softly or lanately fimbriately plumose, fimbriae conspicuously intertwining; florets of some shade of yellow, white, blue, or purple; leaves often grasslike.

9a. Phyllaries in 1(or 2) series, outer series if present never leaflike .................................................................. 55. Tragopogon
9b. Phyllaries in several series, or in 2 series but then outer series leaflike and longer than inner series.

10a. Phyllaries in 2 series, outer phyllaries herbaceous, leaflike, usually longer than inner phyllaries, inner usually 5 ............................................................................................................... 54. Epilasia
10b. Phyllaries in several series, outer phyllaries never leaflike and longer than inner ones.

11a. Leaves undivided, parallel-veined, grasslike or more rarely also lanceolate to ovate .................. 51. Scorzonera
11b. Leaves pinnately divided .......................................................... 52. Podospermum

12a. Pappus white, of numerous fine cottony outer bristles intermixed with some thicker inner ones .................. 63. Sonchus
12b. Pappus white or grayish, yellowish, straw-colored, brownish, or reddish brown, of bristles ± equal in diam. and stiffness.

13a. Leaves, axes, or involucres with various types of hairs, but including stellate hairs and/or multiseriate hairs with projecting cell apices.

14a. Achene 2.5–5 mm, with 8–10 equal ribs apically confluent in an obscure ring ........................................................................ 84. Hieracium
14b. Achene 1–2 mm, with apically distinct ribs not confluent in an obscure ring ............................... 85. Pilosella
13b. Leaves, axes, or involucres glabrous or hairy, but never with stellate hairs or multiseriate hairs with projecting cell apices.
15a. Capitulum solitary on a hollow scape (without nodes, leaves, or bracts) single or few from a leaf rosette; achene beak usually longer than achene body, body at least apically mostly spinulose, scaly, and/or tuberculate and usually with an apical cone .......................................................... 71. Taraxacum
15b. Capitula usually few to numerous, either fascicled or aggregated amid a leaf rosette, or on a branched stem; if capitulum rarely solitary then not on a hollow scape and achene not as above.
16a. Rosulate herbs with several to many capitula either on short, wiry unbranched axes (peduncles) directly from and fasciculate amid leaf rosette, or sessile to very shortly pedunculate and densely aggregated on an apically ± inflated, flat, convex, or more rarely cylindrically elongate rosette shoot.
17a. Capitula with 3–6 florets, sessile or on peduncle shorter than involucre; phyllaries in 1 series, hardened in fruit, outer phyllaries absent, inner ones connate in basal part.
18a. Florets yellow or pale to medium purplish; achene obconical, compressed, with 5 ribs, apex truncate; pappus bristles caducous .......................................................... 77. Syncalathium
18b. Florets purplish red to blue; achene obovoid, compressed, with winglike lateral ribs and 1 slender rib on either side, apex constricted into a ca. 0.5 mm fragile thin beak; pappus caducous with pappus disk (M. souliei) .................................................................... 58. Melanoseris
19b. Florets yellow or rarely white.
20a. Capitula with 4 or 5 florets, with a peduncle shorter than to ± as along as involucre and from an apically ± inflated, flat, convex, or more rarely cylindrically elongate rosette shoot (Soroseris spp. 3–7) .......................................................... 80. Soroseris
20b. Capitula with 12–30 florets, with a peduncle usually longer than involucre, from a non-inflated rosette shoot.
21a. Synflorescence hemispheric, of many densely crowded capitula surrounded by a rosette of orbicular to ovate leaves abruptly contracted into an unwinged petiole-like basal portion; florets yellow or white (Soroseris spp. 1 and 2) ......................................................... 80. Soroseris
21b. Synflorescence loosely corymbiform with few to several capitula amid a rosette of ± spatulate leaves very gradually attenuate toward base; florets yellow ................................................. 66. Youngia
16b. Capitula few to numerous on a branched stem a few cm to more than 2 m tall; rarely capitulum solitary on an unbranched stem.
22a. Achene isodiametric and with ribs of ± equal shape and size; pappus white, rarely pale yellowish.
23a. Achene with 10 very prominent ± winglike ribs .......................................................... 74. Iceris
23b. Achene with 10–20 ± prominent but never winglike ribs.
24a. Plants delicate; involucre narrowly cylindric, longest outer phyllary ≤ 1/4(–1/3) of inner ones, inner phyllaries abaxially glabrous; capitula with 5–15 florets; achene pale brown, with 10 ribs .... 72. Askellia
24b. Plants usually robust; involucre cylindric to campanulate, longest outer phyllary 1/4–2/3 or more of inner ones, inner phyllaries abaxially usually with simple and/or glandular hairs along midvein; capitula with 8–20–70 (and more) florets; achene of some shade of brown, with 10–20 ribs .......................................................... 65. Crepis
22b. Achene (sometimes except inner ones) somewhat to distinctly compressed and/or with ± unequal ribs; pappus white, yellowish, or brownish.
25a. Pappus yellowish, straw-colored, brownish, or grayish and achene never strongly compressed with dominant lateral ribs and/or with capillaceous beak.
26a. Florets reddish to bluish purple, or blue.
27a. Involucre broadly campanulate; capitula with many (usually 50–70) florets; stem in upper half and peduncles often with long stiff blackish hairs .............................................. 76. Dubyaea
27b. Involucre narrowly cylindric to narrowly campanulate; capitula with 5–30 florets; stem in upper half and peduncles glabrous .......................................................... 56. Faberia
26b. Florets yellow, or rarely whitish to pale purplish or pale greenish.
28a. Involucre 4.5–8 mm; capitula erect.
29a. Achene with short slender beak; pappus yellowish to yellowish brown ........................................ 73. Iseridium
29b. Achene apically attenuate but not beaked; pappus ash-gray or yellowish brown .................. 66. Youngia
28b. Involucre 10–20 mm; capitula often nodding at anthesis.
30a. Synflorescence secundly racemiform (Y. racemifera) ........................................................ 66. Youngia
30b. Synflorescence corymbiform or paniculiform, or capitula 1 or 2.
31a. Stem, branches, and phyllaries with conspicuous stiff yellowish brown, reddish, purplish brown, or blackish mostly glandular hairs, or glabrous and stem with 1 or 2 nodding capitula only ................................................................. 76. Dubyaea

31b. Stem, branches, and phyllaries glabrous and stem with some to many capitula, or ± hairy but never with conspicuous stiff mostly glandular hairs.

32a. Leaves grasslike ...................................................................................................................... 78. Hololeion

32b. Leaves pinnately lobed or, if undivided, ovate to triangular-ovate ........................................ 79. Nabalus

25b. Pappus white, exceptionally faintly yellowish or brownish but then achene strongly compressed with dominant lateral ribs and/or with capillaceous beak.

33a. Plants broomlike and/or achene with body apically scaly and/or tuberculate and beaked (sometimes very shortly) .................................................................................................................. 64. Chondrilla

33b. Plants never broomlike, achene beaked or not but body never scaly or tuberculate.

34a. One of following features applies: 1) achene ± compressed with ± dominating or broadened lateral ribs; 2) pappus double and additionally with an outer series of minute hairs (usually ≤ 0.3 mm); 3) florets purplish, bluish, or exceptionally white.

34b. Achene ± isodiametric or ± compressed but not with ± dominating or broadened lateral ribs; pappus always single; florets always of some shade of yellow.

35a. Achene black or reddish-purplish (if rarely pale then plant scandent), fusiform to cylindric, without dominating lateral ribs, and apex truncate, attenuate, or shortly (ca. 1 mm) beaked; florets some shade of purple or blue; pappus simple; involucre narrowly cylindric.

35b. Achene pale to dark brown, more rarely blackish or reddish brown, gray, or olive green, subcylindric, ± ellipsoid to obovoid, or ± fusiform, usually with, rarely without, dominating or broadened (sometimes winglike) lateral ribs and apex truncate to long filiform beaked; florets simple or double; florets yellow, bluish, or purplish, rarely white; involucre narrowly cylindric, cylindric, campanulate, or broadly campanulate.

36a. Achene black, fusiform, weakly compressed, apex attenuate to shortly beaked and often pale ................................................................................................................... 59. Paraprenanthes

36b. Achene reddish-purplish (rarely pale and plant scandent), fusiform to cylindric, compressed, apex truncate ........................................................................................................... 60. Notoseris

37a. Achene pale to dark brown, more rarely blackish or reddish brown, gray, or olive green, subcylindric, ± ellipsoid to obovoid, or ± fusiform, usually with, rarely without, dominating or broadened (sometimes winglike) lateral ribs and apex truncate to long filiform beaked; florets simple or double; florets yellow, bluish, or purplish, rarely white; involucre narrowly cylindric, cylindric, campanulate, or broadly campanulate.

37b. Achene ± compressed, dominating lateral ribs never winglike, apex truncate, attenuate, or with a short stout or with a long filiform beak; florets usually double, more rarely outer series with minute hairs indistinct or missing; involucre narrowly cylindric to broadly campanulate, inner phyllaries 3 to many; capitula erect or nodding; stems and branches glabrous, or hispid, hisurate, or otherwise hairy; florets mostly some shade of blue or purple, exceptionally white, very rarely yellow.

38a. Involucre with 5–10 inner phyllaries, 6–10(–12) mm and narrowly cylindric, or cylindric, 11–13 mm, and with longest outer phyllary 1/2–3/4 of inner ones, or to 15 mm, broadly cylindric to campanulate, and herb tall with many-capitellate narrowly racemiform synflorescence to 50 cm; florets always bluish or purplish; achene 4–5 mm .............................................................................................................................. 57. Cicerbita

38b. Involucre broadly cylindric to broadly campanulate, mostly exceeding 15 mm and never with many-capitellate narrowly racemiform synflorescence to 50 cm, or rarely narrowly cylindric but then with either only 3 or 4 inner phyllaries, or > 13 mm, or strongly hisurate, or florets yellow, or achene ≥ 6 mm, or, if rather cylindric, longest outer phyllary to ca. 1/2 of inner ones ............................................................................................................. 58. Melanoseris

39a. Achene apex ± truncate (at least before shedding of pappus disk if pappus disk caducous).

40a. Longest outer phyllary ± 1/3 of inner ones; stem stiff erect; synflorescence narrowly racemiform or paniculiform; pappus caducous (without pappus disk) ........................................ 75. Sonchella

40b. Longest outer phyllary 1/2–3/4 of inner ones; stem weak and procumbent to ascending, or long creeping, or if stiff erect then hardened and densely divaricately and intricately branched; synflorescence corymbose to divaricately paniculiform, or capitulum solitary; pappus persistent or caducous together with pappus disk .................................................................................................................. 62. Launaea
39b. Achene apex distinctly attenuate to beaked.
41a. Stem leaves well developed and at least upper ones conspicuously clasping stem, or plant stoloniferous (*Crepidiastrum* spp. 1–6) ................................................................. 68. *Crepidiastrum*
41b. Stem leaves absent or present but not clasping stem and plant not stoloniferous.
42a. Stems herbaceous to hardened, several to numerous, more rarely only 1, erect, with some to many heads, from a stout woody caudex and plant often caespitose; basal leaves and stem leaves (if present) pinnate to bipinnate with linear, lanceolate, or filiform lobes; involucre 8–12 mm, most phyllaries subapicallyusted or corniculate (*Crepidiastrum* spp. 7–9) ................................................................. 68. *Crepidiastrum*
42b. Stems usually 1 or 2, of various kind, either from an inconspicuous caudex and plant never caespitose, or plants annual; involucre ≤ 7 mm and phyllaries subapically all strictly plane, or involucrle to 13 mm and either some phyllaries crested or corniculate but then leaves never pinnate with linear, lanceolate, or filiform lobes, or all strictly plane.
43a. Involucre narrowly cylindric, 7–8 mm, all phyllaries subapically plane; perennial rosulate herbs, stem solitary; either stem, branches, and phyllaries white echinulate, or rosette leaves with a pentagonal or triangular lamina and a petiole as long as or longer than lamina (*Ixeridium* spp. 7 and 8) .................................................................................. 73. *Ixeridium*
43b. Involucre 4–13 mm, phyllaries all subapically plane or some crestcd or corniculate; annual herbs, or if perennial herbs and rosulate then stem, branches, and phyllaries never white echinulate and leaves never as above ......................................................... 66. *Youngia*


鸦葱属 ya cong shu

*Lasiospora* Cassini; *Takhtajaniantha* E. A. Nazarova.

Herbs, perennial [or annual], rarely subshrubs, often with woody caudex and rosulate. Leaves usually linear to linear-elliptic or lanceolate, more rarely also ovate, with parallel veins, not divided, base with semiamplexicaul usually persistent sheath, margins entire, flat, or sometimes undulate. Involucre cylindric to campanulate, usually very conspicuously prolonged toward fruiting. Phyllaries in few to several series, imbricate, often (especially inner phyllaries) with scarious margin; longest outer phyllaries usually to than remainder; bristles softly fimbriately plumose for most of length and apically scabrid.

About 180 species: N Africa, Asia, Europe; 24 species (four endemic) in China.

Even after exclusion of *Podospermum* and *Epilasia*, *Scorzonera* is still polyphyletic (*Mavrodiev et al., Taxon 53: 699–712. 2004*). Because a more detailed phylogenetic study and revision of *Scorzonera s.l.* is not yet available, and the circumscription of its diverse elements therefore not clear, the genus is treated here in this wider sense still including *Takhtajaniantha* and *Lasiospora*.

1a. Perennial herbs or subshrubs, often hemispheric; stems usually basally woody, virgate, repeatedly divaricately branched; basal leaves early deciduous; stem leaves linear to filiform and small, or larger and spreading.
2a. Caudex with scarious leaf sheath residues; stem leaves inconspicuous, to 10 mm; capitula with 4 or 5 florets ........................................................................................................................................ 1. *S. divaricata*

2b. Caudex with fibrous and lacerate leaf sheath residues; stem leaves conspicuous, horizontally spreading to spreading-erect, 1–9 cm; capitula with 7–12 florets .................................................................................. 2. *S. pseudodivaricata*

1b. Perennial herbs, never hemispheric; stems herbaceous, unbranched or rather weakly branched; basal leaves usually present; stem leaves present or absent, of various shapes.
3a. Caudex with conspicuous dark brown fibrous and lacerate leaf sheath residues.
4a. Leaves filiform to filiform-linear, 1–1.5 mm wide, almost somewhat curled, glaucous ................................. 10. *S. curvata*
4b. Leaves not filiform to filiform-linear, 2 mm or more wide, ± straight, green.
5a. Ovary and achene shortly villous along their entire length.

6a. Leaves 2–15 mm wide, margin undulate; plants glabrous; achene ca. 10 mm ......................... 11. *S. ikonnikovii*
6b. Leaves 3–4 mm wide, margin flat; leaves, stems, and phyllaries floccose or lanate when young, soon glabrescent; achene 7–8 mm ........................................................................................... 12. *S. manshurica*

5b. Ovary and achene glabrous.
7a. Stem (especially apically) and involucre basally floccose arachnoid hairy; leaves 2–4 mm wide ........................................................................................................ 9. *S. subacaulis*

7b. Plants usually glabrous (occasionally leaf sheath margin or apical phyllary margin arachnoid hairy); leaves sometimes as narrow as 2 mm wide, otherwise 0.5–3(–4.5) cm wide.

8a. Basal leaves often rather narrow (linear, linear-lanceolate, or linear-elliptic), margin usually flat ........................................................................................................ 7. *S. austriaca*

8b. Basal leaves often rather broad (broadly ovate, ovate-lanceolate, ob lanceolate, elliptic-lanceolate, linear-elliptic, or linear), margin undulate ........................................................................... 8. *S. sinensis*

3b. Caudex with smooth, usually scarious, rarely with age lacerate or somewhat fibrous but never dark brown fibrous leaf sheath residues, or without leaf sheath residues.

9a. Ovary and achene densely villous along their entire length.

10a. Leaves usually 0.8–1.5 cm wide, leaf blade margin densely undulate; plants with globose tuber some cm below surface ........................................................................................................ 24. *S. circumflexa*

10b. Leaves usually 2–8 mm wide, leaf blade margin flat; plants with or without globose tuber.

11a. Plants without tuber, to 40 cm tall; pappus 2–2.5 cm ........................................................................ 22. *S. ensifolia*

11b. Plants with tuber some cm below surface, to 20 cm tall; pappus less than 1.5 cm .......... 23. *S. sericeolanata*

9b. Ovary and achene glabrous or at most ± villous at pappus disk.

12a. Stems leafless, sparsely leaved, or with reduced leaves, with 1 or few single-capitellate branches, or plants subacauliscent.

13a. Caudex conspicuously dirty white lanate of adaxially thickly lanate leaf sheath residues; leaves broadly lanceolate to ovate, at least in part usually more than 2 cm wide .......................... 3. *S. capito*

13b. Caudex not lanate, leaf sheaths adaxially glabrous; leaves at most ca. 1.5 cm wide.

14a. Involucre, base of involucre, and sometimes leaves somewhat arachnoid hairy; florets ca. 2 × as long as involucre ........................................................................................................ 6. *S. radiata*

14b. Plants entirely glabrous; florets less than 1.5 × as long as involucre.

15a. Leaves lanceolate, or narrowly elliptic to linear, 2–15 mm wide ........................................ 4. *S. parviflora*

15b. Leaves linear, 1–2 mm wide .................................................................................. 5. *S. luntaiensis*

12b. Stems leafy, well developed, and usually branched at least basally.

16a. Plants of saline soil, glabrous (but leaf sheaths adaxially often lanate) and grayish to glaucous green; leaves ± fleshy, narrowly elliptic to lanceolate; stem leaves often partly opposite ............................................................ 21. *S. mongolica*

16b. Plants not of saline soil, glabrous and fresh green or with indumentum; leaves not fleshy, variously shaped; stem leaves always alternate.

17a. Plants with tuber some cm below surface, to 20(–40) cm tall; leaves 1–3 mm wide.

18a. Plants 30–40 cm tall; involucre 2–2.4 cm at anthesis ........................................ 20. *S. aniana*

18b. Plants to 20 cm tall; involucre 1.3–1.8 cm at anthesis.

19a. Caudex with adaxially lanate leaf sheath residues; involucre ca. 1.8 cm at anthesis; pappus bristles plumose for most of length .......................................................... 18. *S. pusilla*

19b. Caudex with glabrous leaf sheath residues; involucre 1.3–1.5 cm at anthesis; pappus bristles scabrid for most of length ........................................................................... 19. *S. pamirica*

17b. Plants without tuber, taller than above; leaves usually wider than above.

20a. Involucre from at least 2 cm at anthesis, to 4 cm in fruit; achene 1.7–2.3 cm, apically conspicuously long attenuate; pappus caducous as an entity .......... 13. *S. albicaulis*

20b. Involucre to 2 cm at anthesis, not more than ca. 3 cm in fruit; achene not more than 1.5 cm, apically not conspicuously attenuate; pappus persistent.

21a. Florets slightly longer than involucre; plants entirely glabrous; achene 7–9 mm ........................................ 4. *S. parviflora*

21b. Florets distinctly longer than involucre (usually ca. 1.5 × as long as involucre); stem, leaves, or involucre with short branched, dendritic or stellate hairs; achene 1–1.5 cm.

22a. Plants with weak, ascending-erect stems to at most 30 cm tall, usually branched already near base; achene with tuberculate ribs.

23a. Plants with conspicuous gray indumentum; leaves linear, 1–5 mm wide, with flat margin ........................................ 16. *S. pubescens*

23b. Plants stellate puberulent, glabrescent; leaves narrowly lanceolate or narrowly elliptic, 4–7 mm wide, with mostly undulate margin ................................................. 17. *S. inconspicua*

22b. Plants with strong erect stems to 75 cm tall, usually branched apically; achene with smooth ribs.

拐轴鸦葱 guai zhou ya cong

Subshrubs or perennial herbs, 20–40 cm tall. Rootstock 4–10 mm in diam. Caudex branched, with smooth scarious leaf sheath residues. Stems some to many, grayish green, slender, erect, repeatedly divaricately and intricately branched from base, pubescent or glabrous, basally woody; branches slender, ascending-erect. Basal leaves few, distant, linear, early deciduous. Stem leaves linear to filiform, 2–10 × 1–3 mm, apex usually hooked; upper stem leaves bractlike, inconspicuous. Capitula many, terminal, with 4 or 5 (to 12–15 in var. sublilacina) florets. Involucre narrowly cylindric, ca. 1 cm at anthesis, 1.5–1.7 × 0.3–0.4 cm in fruit. Phyllaries puberulent, pubescent, or sparsely pubescent in fruit; outer phyllaries ovate to lanceolate, longest ca. 1.2 cm as long as inner phyllaries; inner phyllaries usually ca. 4. Florets yellow (or pale purple in var. sublilacina). Achene yellow to yellowish brown, cylindric, 7–9 mm, with smooth ribs, glabrous or apically villous. Pappus straw-colored to brownish, ca. 1.5 cm. Fl. and fr. May–Sep.

Dry riverbeds, lowland sand dunes, gullies, valleys, hills, slopes, plains at base of mountains; 900–2000 m. Gansu, Hebei, Ningxia, Shaanxi, Shansi [Mongolia].

1a. Florets yellow; achene glabrous ............ 1a. var. divaricata
1b. Florets pale purple; achene apically villous ................................................... 1b. var. sublilacina

1a. Scorzonera divaricata var. divaricata

拐轴鸦葱(原变种) guai zhou ya cong (yuuan bian zhong)

Scorzonera divaricata var. intricatissima Maximowicz.

Florets yellow. Achene glabrous.

Dry riverbeds, lowland sand dunes, gullies, valleys; 500–2000 m. Gansu, Hebei, Ningxia, Shaanxi, Shansi [Mongolia].


紫花拐轴鸦葱 zi hua guai zhou ya cong

Florets pale purple. Achene apically villous.

● Hills, slopes, plains at base of mountains; ca. 1500 m. Gansu, Nei Mongol (Hohhot).

Scorzonera divaricata var. sublilacina, originally described by Maximowicz from material from Nei Mongol and Gansu with capitula of up to 15 pale purple florets, was referred by Lipschitz (Fragm. Monogr. Scorzonera 2: 124. 1939) to this species rather than to S. pseudodivaricata as were the other varieties with more numerous florets than is usual in S. divaricata. A reassessment of this taxon and its affinity appears worthwhile with the frequent confusion between plants of S. divaricata and S. pseudodivaricata. Because the yellow ligules of both S. divaricata and S. pseudodivaricata can become pinkish on drying, floret color needs to be established on living plants.

Scorzonera divaricata var. sublilacina is used medicinally for treating serious cases of boils.


帚状鸦葱 zhou zhuang ya cong

Scorzonera divaricata Turczaninow var. foliata Maximowicz; S. divaricata var. virgata Maximowicz; S. muriculata C. C. Chang; S. pseudodivaricata var. leiocarpa C. H. An; S. rugulosa C. C. Chang.

Subshrubs or perennial herbs, 7–50 cm tall. Rootstock ca. 9 mm in diam. Caudex unbranched or more rarely branched, with somewhat fibrous and lacerate leaf sheath residues. Stems some to many, grayish green, rigid, herbaceous, sparsely to moderately divaricately branched in apical half, puberulent, glabrescent, or glabrous, leafy; branches virgate, slender, spreading-erect. Basal leaves crowded, linear, early deciduous. Stem leaves linear to filiform, usually 1–9 cm × 0.5–5 mm, horizontally spreading to spreading-erect, straight or somewhat hooked, often falcate, pubescent, glabrescent, or glabrous; upper stem leaves progressively smaller but mostly still leaflike. Capitula many, terminal, with usually 7–12 florets. Involucre cylindric, usually 1.5–1.8 cm at anthesis, 1.8–2.5 × 0.5–0.8 cm in fruit. Phyllaries puberulent; outer phyllaries triangular-ovate to linear-lanceolate, longest 1/2–2/3 as long as inner phyllaries; inner phyllaries usually 5 or 6. Florets yellow. Achene brownish, dark green, or blackish, cylindric, 7–8 mm, with elevated smooth or tuberculate ribs, glabrous. Pappus dirty white to straw-colored, 1.3–1.8 cm. Fl. and fr. May–Oct.

Gravelly deserts, dry slopes, along streams, sandy soils; 600–3100 m. Gansu, Nei Mongol, Ningxia, Qinghai, Shansi, Sichuan, Xinjiang [Mongolia].

Scorzonera pseudodivaricata has often been confused with S. divaricata, hence the name, but both species are actually well distinct.

A report by Ostenfeld (in Hedin, S. Tibet 6(3): 29. 1922) of Scorzonera divaricata var. virgata Maximowicz (being a synonym of S. pseudodivaricata) was erroneously treated by Tzvelev (Rast. Tsentr. Azi 14b: 122. 2008) as “S. divaricata Turczaninow var. virgata (Candolle) Maximowicz” and, consequently, taken as a substantiation for the presence of the W Himalayan S. virgata Candolle in Xinjiang and C Asia, which is, however, clearly erroneous.


棉毛鸦葱 mian mao ya cong

Herbs 5–15 cm tall, perennial, rosulate. Rootstock dark brown, ca. 2 cm in diam. Caudex woody, globose to subglobose, simple or branched, densely covered with scarious entire adaxially abundantly dirty white lanate leaf sheath residues. Stems single or to 5(–7), ascending-erect, straight or somewhat arachnoid villous, glabrescent. Rosette leaves ovate to spatulate or elliptic, (3–)5–17 × (1–)2–3[–5] cm, somewhat arachnoid hairy, base attenuate, apex rounded, obtuse, or acute. Stem leaves 1–3, sessile, ovate to lanceolate, 0.5–2 × 0.3–1.5 cm, ± leathery, somewhat arachnoid hairy, glabrescent, or glabrous, base cordate and semiamplexicaul. Capitulum solitary. Involucre
broadly campanulate to subglobe, usually 1.6–2 × 1.2–1.5 cm at anthesis, to 2.5 × > 2 cm in fruit. Phyllaries abaxially arachnoid hairy; outermost phyllaries broadly ovate to broadly lanceolate. Florets yellow. Achene pale yellow, cylindric, 7–9 mm, with tuberculate ribs, apically sparsely villous. Pappus white, 1–1.5 cm. Fl. and fr. May–Aug.

Gravelly deserts, sandy soils, alluvial plains; 1100–1500 m. Nei Mongol, Ningxia [Mongolia].


光鸦葱 guang ya cong

Scorzonera caricifolia Pallas; S. halophila Fischer & C. A. Meyer ex Candolle.

Herbs 10–60 cm tall, perennial, rosulate, entirely glabrous. Rootstock creeping, ca. 1.5 cm in diam., usually branched. Caudex with or without scarios leaf sheath residues. Stems solitary or few, ascending to erect, unbranched or rarely sparsely branched. Rosette leaves lanceolate or narrowly elliptic to linear, 7–20 × 0.2–1.5 cm, often somewhat fleshy, base attenuate, apex acute to acuminate. Stem leaves few, smaller than rosette leaves, narrowly lanceolate. Caudex cylindrical, rarely 2 or 3 per stem and distant. Involucrre cylindric, usually 1.5–1.8 × 0.5–0.8 cm at anthesis, to 2.5–3 × 1–1.3(–1.5) cm in fruit. Phyllaries abaxially glabrous, apex acute to subobtuse; outermost phyllaries ovate to triangular-ovate. Florets yellow, slightly longer than involucre. Achene yellowish, cylindric, 7–9 mm, with smooth elevated ribs, glabrous. Pappus dirty white, 1.5–1.8 cm. Fl. and fr. Jun–Sep. 2n = 14.

Wet subsaline meadows, riverbanks, at springs; 900–1700 m. Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Mongolia, Russia (C, E, and S European parts), Turkmenistan, Uzbekistan; SW Asia, C and S Europe].


轮台鸦葱 lun tai ya cong

Herbs 12–14 cm tall, perennial, rosulate. Rootstock brown, ca. 5 mm in diam. Caudex with pale brown leaf sheath residues. Stems solitary, ca. 1.5 mm in diam., erect, unbranched, subglabrous or glabrous. Rosette leaves linear, 6–10 × 0.1–0.2 cm, glabrous, base attenuate, margin flat, apex acuminate. Stem leaves very few, mostly on basal portion of stem, similar to rosette leaves but smaller, subulate to linear. Caudex cylindrical, 1.4 × 0.5 cm at anthesis. Phyllaries abaxially glabrous; outermost phyllaries ovate, ca. 4 × 2.2 mm, apex acute. Achene when immature without tubercles, glabrous, not seen when mature. Pappus white, ca. 8 mm. Fl. Jul.

- Damp riverbanks; ca. 1500 m. Xinjiang (N Tarim Pendi).


毛梗鸦葱 mao geng ya cong

Scorzonera radiata var. rebunensis (Tatewaki & Kitamura) Nakai; S. radiata var. subacaulis Lipschitz & Krascheninnikov; S. rebunensis Tatewaki & Kitamura.

Herbs (3–)15–30(–50) cm tall, perennial, rosulate. Rootstock ca. 1.5 cm in diam. Caudex with scarios leaf sheath residues. Stems solitary to few, erect, unbranched, arachnoid hairy especially under capitula, glabrescent with age. Rosette leaves linear, linear-lanceolate, or linear-elliptic, 5–30 × 0.3–1.5[–1.8] cm, sometimes sparsely arachnoid hairy, glabrescent, base attenuate, apex acuminate. Stem leaves 0–3, linear to linear-lanceolate, smaller than rosette leaves. Caudex cylindrical. Involucre broadly cylindric to campanulate, 1.7–2.1 × 0.8–1 cm at anthesis, to 2.6 × 1.8 cm in fruit. Phyllaries abaxially sparsely arachnoid hairy, glabrescent, apex usually with a red spot; outermost phyllaries ovate to broadly lanceolate. Florets yellow, almost 2 × as long as involucre. Achene cylindric, 0.9–1.3 cm, with smooth elevated ribs, glabrous. Pappus dirty yellow, 1.1–1.4 cm. Fl. and fr. May–Jul. 2n = 14.

Forest margins, forests, grasslands, gravelly riverbanks; 900–2600 m. Heilongjiang, Jilin, Liaoning, Ningxia, Xinjiang [Kazakhstan, Russia (Asian part), Uzbekistan].


鸦葱 ya cong

Scorzonera austriaca var. plantaginifolia Kitagawa; S. sinensis (Lipschitz & Krascheninnikov) Nakai f. plantaginifolia (Kitagawa) Nakai.

Herbs 5–45 cm tall, perennial, rosulate. Rootstock dark brown. Caudex woody, densely covered with brown fibrous and lacerate leaf sheath residues. Stems solitary or few, erect, unbranched, glabrous. Rosette leaves narrowly linear, linear-lanceolate, linear-elliptic, or narrowly elliptic, usually 3–35 × 0.2–2.5 cm, glabrous or occasionally base and sheath marginally arachnoid hairy, base long attenuate, margin flat, apex acute to acuminate. Stem leaves 2 to several, scalelike, lanceolate to subulate-lanceolate, base semiamplexicaul. Caudex cylindrical. Involucre cylindric, usually 2.1–2.8 × 0.6–1.2 cm at anthesis, to 3.3 × 1.5 cm in fruit. Phyllaries abaxially glabrous or occasionally inner ones apically arachnoid hairy at margin, apex acute, obtuse, or rounded; outermost phyllaries triangular to triangular-ovate. Florets yellow, usually to 1.5–1.7 × as long as involucre. Achene whitish to pale brown, cylindric, 1.2–1.5 cm, with smooth or sometimes tuberculate ribs, glabrous. Pappus dirty white, usually 1.5–1.7 cm. Fl. and fr. Apr–Jul. 2n = 14*.

Slopes, floodplains, grassy riverbanks and lake shores; 400–2000 m. Gansu, Hebei, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Xinjiang [Kazakhstan, Mongolia, Russia; C and SE Europe].

Scorzonera austriaca is the widespread and name-giving taxon of the highly polymorphic S. austriaca complex, to which the following five species belong, and which is in need of a modern revision covering its entire distribution area. The following two species appear to lack clear morphological discontinuities and seem thus doubtfully distinct at species rank.


桃叶鸦葱 tao ye ya cong
Scorzonera austriaca Wildenow subsp. sinensis Lipschitz & Krascheninnikov, Fragm. Monogr. Scorzonera 1: 120. 1935.

Herbs usually 5–50 cm tall, perennial, rosulate. Rootstock brown to dark brown, ca. 1.5 cm in diam. Caudex woody, often branched, densely covered with fibrous and lacerate leaf sheath residues. Stems solitary or few, erect, unbranched, glabrous. Rosette leaves broadly ovate, ovate-lanceolate, oblanceolate, elliptic-lanceolate, linear-elliptic, or broadly linear, usually 5–20(–30) × (0.5–)1–3(–4.5) cm, glabrous, base long attenuate, margin undulate, apex acute to acuminate. Stem leaves few to several, scalelike, lanceolate to subulate-lanceolate, base semi-amplexicaul. Capitulum solitary. Involucre cylindric, usually 1.8–2.5 × 0.7–1.3 cm at anthesis, to 3.5 × 1.8 cm in fruit. Phyllaries abaxially glabrous, apex obtuse to acute; outermost phyllaries triangular to sometimes obliquely triangular-ovate. Flores yellow, usually to 1.5–1.7 × as long as involucre. Achene whitish to pale brown, cylindric, 1.2–1.4 cm, with smooth ribs, glabrous. Pappus dirty white to dirty yellow, usually 1.5–1.8 cm. Fl. and fr. Feb–Sep.

Mountain slopes, hills, wastelands, thickets; 200–2500 m. Anhui, Gansu, Hebei, Henan, Jiangsu, Liaoning, Nei Mongolia, Ningxia, Shaanxi, Shandong, Shanxi [Mongolia].

Scorzonera sinensis is delimited from S. austriaca largely by its undulate leaves, which it shares, however, with S. crispa M. Bieberstein (S. austriaca subsp. crispa (M. Bieberstein) Lipschitz & Krascheninnikov) from Crimea and Kazakhstan. According to Lipschitz (Fragm. Monogr. Scorzonera 1: 121. 1935; Fl. URSS 29: 68–69. 1964), it differs from the latter by basally more shortly attenuate, green rosette leaves.


小鸦葱 xiao ya cong


Herbs, acaulescent or to 10 cm, perennial, rosulate. Rootstock dark brown, terete, ca. 8 mm in diam. Caudex woody, with fibrous and lacerate leaf sheath residues. Stems solitary or more rarely 2, unbranched, flocose arachnoid hairy especially apically. Rosette leaves linear, 8–10 × 0.2–0.4 cm, glabrous, apex acuminate. Stem leaves 1 or 2, scalelike, lanceolate. Capitulum solitary. Involucre broadly cylindric, 1–1.5 cm in diam. in fruit. Phyllaries glabrous or basally somewhat arachnoid hairy, apex acute; outermost phyllaries triangular to ovate. Flores yellow, ca. 1.5 × as long as involucre. Corolla ligule with dark red striae. Achene cylindrical, 8–10 mm, with smooth ribs, glabrous. Pappus dirty white, ca. 1.2 cm. Fl. and fr. Jun–Jul.

Grassy mountain slopes; above 2600 m. Xinjiang [Kazakhstan, Kyrgyzstan].

The delimitation of Scorzonera subacaulis and acaulescent forms of S. radiata (the latter without fibrous and lacerate leaf sheath residues and with the florets 2 × as long as the involucre) appears often somewhat blurred in the literature (e.g., Lipschitz, Fl. URSS 29: 67–68. 1964). Regel (Bull. Soc. Imp. Naturalistes Moscou 40(3–4): 170. 1867) considered even an intermediate position of this taxon between both species. See also note under S. austriaca.


丝叶鸦葱 si ye ya cong


Herbs 4–7 cm tall, perennial, rosulate. Rootstock dark brown, cylindric, ca. 1.5 cm in diam. Caudex densely covered with fibrous and lacerate leaf sheath residues. Stems solitary or few, erect, glabrous. Rosette leaves filiform to filiform-linear, 3–10 cm × 1–1.5 mm, usually flat or twisted, glaucous, glabrous but margin basally arachnoid lanceate, apex acuminate. Stem leaves absent or few, scalelike, subulate-lanceolate. Capitulum solitary. Involucre campanulate to narrowly campanulate, ca. 1 cm in diam. in fruit. Phyllaries abaxially glabrous, apex acute to subobtuse; outermost phyllaries triangular to triangular-lanceolate, 5–8 × 2–3 mm. Flores yellow. Achene cylindric, with smooth to tuberculate ribs, shortly villous. Pappus pale brown, ca. 1.2 cm. Fl. and fr. May–Jun.

Hills, dry mountain slopes; 500–2500 m. Heilongjiang, Nei Mongolia, Qinghai [Mongolia, E Russia].

See note under Scorzonera austriaca.


毛果鸦葱 mao guo ya cong

Scorzonera austriaca Wildenow var. hebecarpa C. H. An.

Herbs to 17 cm tall, perennial, rosulate. Rootstock yellow, obconic, ca. 2 cm in diam. Caudex densely covered with brown fibrous and lacerate leaf sheath residues. Stems few, unbranched, glabrous. Rosette leaves narrowly lanceolate, linear-lanceolate, linear-elliptic, or linear, to 15 × 0.2–0.6(–1.5) cm, glabrous, base attenuate, margin undulate, apex usually recurved and acuminate. Stem leaves 2 or 3, brown, scalelike, narrowly lanceolate to subulate-lanceolate. Capitulum solitary. Involucre campanulate to subglobose, to 2–2.5 × 1.5–2 cm in fruit. Phyllaries abaxially glabrous, apex acute to obtuse; outermost phyllaries triangular to ovate-triangular, to 7 × 2.5 mm. Flores yellow. Achene cylindrical, ca. 1 cm, with smooth ribs, shortly villous. Pappus dirty yellow, ca. 1.2 cm. Fl. and fr. Apr–May. 2n = 14.

Mountain slopes; 1300–1800 m. Liaoning, ?Nei Mongolia, Xinjiang (Jinghe) [Mongolia].

Scorzonera ikonnikovii is very similar to S. austriaca (see also note there) but is distinguished by its villous achenes. Centered in Mongolia, it seems to be rare in China, reaching only into the NW and NE. Its delimitation from S. manshurica needs closer consideration.


东北鸦葱 dong bei ya cong
Scorzonera glabra Ruprecht var. manshurica (Nakai) Kitagawa.

Herbs to 14 cm tall, perennial, rosulate. Rootstock obconic, ca. 3 cm in diam. Caudex densely covered with brown fibrous and lacerate leaf sheath residues. Stems few, unbranched, conspicuously floccose or lanate when young, soon glabrescent. Rosette leaves linear, 8–10 × 0.3–0.4 cm, adaxially densely lanate when young, glabrescent, base attenuate, margin flat and basally lanate, apex acute to long acumenate. Stem leaves 1–3, scalelike, subulate-triangular, margin and adaxially lanate. Capsitulum solitary. Involucre campanulate, to 2 × 1.8 cm in fruit. Phyllaries abaxially white puberulent and tinged lanate. Capitulum solitary. Involucre campanulate, to 2 × 1.8 cm at anthesis, to 3 cm in fruit. Phyllaries arachnoid branched hairy; outermost phyllaries triangular to ovate-triangular, largest ca. 7 × 3 mm. Achene dirty yellow, 1–1.5 cm. Fl. and fr. Apr–May.


Scorzonera manshurica seems close to S. ikonnikovii, and the delimitation between the two species should be reassessed. See also note under S. austriaica.


华北鸦葱 hua bei ya cong

Achyroseris albicaulis (Bunge) Kamelin & Tagaev; A. macrosperma Schultz Bipontinus; Scorzonera albicaulis f. flavescens Nakai; S. albicaulis subsp. macrosperma (Turczaninow ex Candolle) Voroshilov; S. albicaulis var. macrosperma (Turczaninow ex Candolle) Kitagawa; S. albicaulis f. rosea Nakai; S. macrosperma Turczaninow ex Candolle; S. macrosemera f. angustifolia Debeaux.

Herbs to 1.2 m tall, perennial. Rootstock cylindrical to obconic, ca. 1.5 cm in diam. Caudex with brown scariosus leaf sheath residues. Stem usually solitary, erect, branched apically, floccosely arachnoid hairy especially apically, glabrescent, leafy. Basal leaves rosulate, usually early deciduous, linear to linear-elliptic, to 40 × 0.3–2 cm, glabrous, margin entire, apex acuminate. Stem leaves similar to basal leaves but shorter. Synflorescence sparsely and usually laxly corymbose, with usually 2–7 capitula. Involucres cylindric, 2.2–2.5 × 0.5–0.7 cm at anthesis, 3.5–4.2 × 0.8–1.3 cm in fruit. Phyllaries abaxially glabrous or thinly arachnoid hairy, glabrescent; outermost phyllaries triangular-ovate to ovate-lanceolate, 5–8 × 2–4 mm. Florets yellow, ca. 1.5 × as long as involucre. Achene pale brown, cylindric and glabrous. Pappus straw-colored, usually 1.7–2.3 cm, with smooth ribs, glabrous. Pappus straw-colored, usually 2.2–2.8 cm, bristles basally connate and caducous as an entity. Fl. and fr. May–Sep. 2n = 14.

Mountain valleys, forests, forest margins, scrub, feral fields, fields; 200–2500 m. Anhui, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan [Korea, Mongolia, Russia (SE Asian part)].

Achyroseris macrosperma Schultz Bipontinus (1845) and Scorzonera macrosperma Turczaninow ex Candolle (1838) are, in spite of having the same epithet, independently described heterotypic synonyms.


北疆鸦葱 be jiang ya cong

Herbs 35–70 cm tall, perennial, with a taproot. Caudex with leaf sheath residues. Stems solitary or few, erect, branched apically, glabrous or somewhat floccose and glabrescent, leafy. Basal leaves linear to linear-lanceolate, 10–25 × 0.4–1 cm, margin flat, apex acuminate. Stem leaves similar to basal leaves but smaller. Synflorescence laxly corymbose, with few capitula. Involucres cylindric, 1.4–1.6 × ca. 0.5 cm at anthesis, to 3 cm in fruit. Phyllaries arachnoid branched hairy; outermost phyllaries triangular to ovate-triangular. Achene cylindric, 1–1.5 cm, with smooth ribs, glabrous. Pappus dirty white, to 2 cm. Fl. and fr. Jul–Aug.

Stony thickets; above 900–1700 m. Xinjiang [Kazakhstan, Kyrgyzstan, Uzbekistan].

See note under the Scorzonera transiliensis.


橙黄鸦葱 cheng huang ya cong

Herbs 25–75 cm tall, perennial, with a taproot. Caudex woody, sometimes branched, with sparse leaf sheath residues. Stems solitary or few, erect, sparsely branched apically, glabrous or weakly floccose with branched hairs, leafy. Basal leaves linear to linear-lanceolate, usually 5–20 × 0.4–0.8 cm, margin flat, apex acuminate. Stem leaves similar to basal leaves but smaller. Synflorescence very loosely corymbose, with few capitula. Involucres cylindric, ca. 1.5 × 0.5 cm at anthesis, to 3–3.5 cm in fruit. Phyllaries arachnoid branched hairy. Florets dark orange. Achene cylindric, ca. 1.5 cm, with smooth ribs, glabrous. Pappus dirty white, ca. 2 cm.

Meadows on mountain slopes; ca. 1700 m. Xinjiang [Kazakhstan, Kyrgyzstan].

Scorzonera transiliensis is closely related to S. iliensis and said to be mainly distinguished by its dark orange florets (Lipschitz, Fl. URSS 29: 84. 1964). It is endemic to the Zailiyskiy and Kungey Alatau (SE Kazakhstan, N Kyrgyzstan) and the Ketmen range of the Tien Shan (SE Kazakhstan) and Tian Shan (NW China). It has been listed for Xinjiang by C. H. An (Fl. Xinjiang. 5: 395. 1999), and the above description is based on that work and the original description. The status of this taxon requires further studies.

16. Scorzonera pubescens Candolle, Prodr. 7: 122. 1838.

基枝鸦葱 ji zhi ya cong

Herbs 7–20 cm tall, perennial, with grayish short branched hairs. Rootstock brown, cylindric, ca. 1 cm in diam. Caudex densely covered with leaf sheath residues. Stems solitary to few, erect, branched from base, basally leafy; branches ascending-erect. Basal leaves linear, 5–20 × 0.1–0.5 cm, margin flat, apex acuminate. Stem leaves similar to basal leaves but smaller. Synflorescence diffusely corymbose, with few capitula. Involucres campanulate, 1.3–2 × 0.3–1 cm. Phyllaries abaxially arachnoid hairy; outermost phyllaries ovate to lanceolate. Florets yellow, sometimes ligule adaxially reddish, ca. 1.5 × as long as involucre. Achene cylindric, 1–1.2 cm, with tuberculate...

Herbs 5–20 cm tall, perennial, with a globose tuber to some cm below surface. Caudex unbranched or branched, with scarios adaxially densely lanate pale brown leaf sheath residues becoming lacerate and subfibrous with age. Stems few to several, erect to arched-erect, sparsely branched apically, glabrous, leafy. Basal leaves linear-lanceolate, to 15 × 0.2–0.3 cm, base inconspicuously attenuate, apex acuminate and often somewhat hooked. Synflorescence sparsely corymbiform, with few capitula or capitulum solitary. Involucre narrowly cylindric, 1.3–1.5 × ca. 0.4 cm at anthesis, more than 2 cm in fruit. Phyllaries abaxially arachnoid hairy, apex acute to obtuse; outermost phyllaries ovate to narrowly ovate, 4–5 × 2–3 mm. Florets yellow. Achenes glabrous, not seen when fully mature. Pappus dirty white, ca. 2 cm or more, scabrid apically or for most of length. Fl. and fr. May–Aug.

- Alpine plains, alpine meadows; 3300–3600 m. Xinjiang (Taxkorgan).


Herbs 4–13 cm tall, perennial, with an ellipsoid tuber to some cm below surface. Caudex with pale brown or pale yellow scarios leaf sheath residues becoming lacerate and subfibrous with age. Stems few, slender, erect to arched-erect, sparsely branched apically, glabrous, leafy. Basal leaves linear, 4–8 × 0.1–0.2 cm, glabrous, apex acuminate. Stem leaves similar to basal leaves but smaller. Synflorescence sparsely corymbiform, with few capitula or capitulum solitary. Involucre narrowly cylindric, 1.3–1.5 × ca. 0.4 cm at anthesis, more than 2 cm in fruit. Phyllaries abaxially arachnoid hairy, apex acute to obtuse; outermost phyllaries ovate to narrowly ovate, 4–5 × 2–3 mm. Florets yellow. Achenes glabrous, not seen when fully mature. Pappus dirty white, ca. 2 cm or more, scabrid apically or for most of length. Fl. and fr. Jun.–Aug.

- Sand dunes; 500–800 m. Xinjiang (Ürümqi).

**Scorzonera aniana** N. Kilian, nom. nov.

Herbs 30–40 cm tall, perennial, with a globose tuber some cm below surface. Caudex unbranched or branched, with scarios adaxially densely lanate pale brown leaf sheath residues becoming lacerate and subfibrous with age. Stems few to several, erect to arched-erect, branched apically, leafy. Stem leaves linear-lanceolate, to 15 × 0.2–0.3 cm, base inconspicuously attenuate, apex acuminate and often somewhat hooked. Synflorescence sparsely corymbiform, with few capitula. Involucre narrowly cylindric, 2–2.4 × 0.4–0.5 cm at anthesis. Phyllaries with arachnoid hairy and glabrescent margin; outermost phyllaries ovate to ovate-lanceolate, ca. 4 mm. Florets yellow. Achene columnar, ca. 1 cm, with tuberculate ribs, glabrous. Pappus yellowish, 2.4–2.6 cm. Fl. May.

- Sand dunes; 500–800 m. Xinjiang (Ürümqi).

**Scorzonera aniana**, the epithet referring to the first author of the replaced synonym, is closely related to *S. pusilla* and *S. pamirica*. No material has been seen by the present authors, and the description is based on Fl. Xinjiang. (loc. cit.).
**Scorzonera fengtienensis** Nakai; **S. hotanica** C. H. An; **S. mongolica** var. *putjatae* C. Winkler.

Herbs 5–35 cm tall, perennial, rosulate. Rootstock cylindric. Caudex with brown to pale yellow scarious leaf sheath residues. Stems few to some, grayish green, ascending to more rarely erect, branched apically, glabrous. Rosette leaves narrowly elliptic, elliptic-lanceolate, or linear-lanceolate, 2–13 × 0.4–1.1 cm, usually ± fleshy, glabrous, somewhat glaucous, base attenuate to long attenuate with an adaxially sometimes lanate sheath, apex acute to acuminate. Stem leaves often partly opposite, similar to rosette leaves but shorter. Synflorescence sparsely corymbiform, with few capitula or more rarely capitulum solitary. Involucre narrowly cylindric, usually 1.7–2.2 × 0.4–0.5 cm at anthesis, to 3 × 0.6–0.7 cm in fruit. Phyllaries abaxially arachnoid hairy and glabrescent or glabrous; outermost phyllaries ovate, 3–5 × 2–5 mm, apex acute. Flores yellow, rarely white, slightly longer than involucre. Achene pale yellow, cylindric, 5–7 cm, with smooth ribs, acute. Florets yellow, rarely white, slightly longer than involucre. Achene pale yellow, cylindric, 5–7 cm, with smooth ribs, apex somewhat pilose, otherwise ± glabrous. Pappus white, 2–2.5 cm. Fl. and fr. Apr–Aug.

Saline meadows, saline sands, alkaline lands, dry lake basins, floodplains, lake margins, grassy beaches; near sea level to 3200 m. Gansu, Hebei, Henan, Liaoning, Nei Mongolia, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Xinjiang [Kazakhstan, Mongolia].


剑叶鸦葱 jian ye ya cong

Lasioспорa ensifolia (M. Bieberstein) Cassini.

Herbs usually 20–40 cm tall, perennial, sparsely rosulate. Rootstock cylindric. Caudex with entire hardened adaxially abundantly reddish brown lanate leaf sheath residues. Stems solitary or few, ± erect, sparsely branched apically, ± pubescent or rarely glabrous, densely leathy. Rosette leaves linear-lanceolate to linear, to 20 × 0.3–0.8 cm, rather rigid, apex filiform acuminate. Stem leaves many, similar to rosette leaves, sparsely pubescent or glabrous. Synflorescence corymbiform, usually with 2–4 capitula. Involucre cylindric, to 2.5 × 1–1.5 cm. Phyllaries abaxially arachnoid hairy; outermost phyllaries lanceolate, apex acuminate and bent. Florets yellow, ca. 1.5 × as long as involucre. Achene cylindric, usually 7–8 mm, densely villose. Pappus pale brownish, 2–2.5 cm. Fl. and fr. May–Aug. 2n = 12.

Sand dunes, wastelands, sandy soils; 500–600 m. Xinjiang [Kazakhstan, Russia (C, E, and S European parts); Europe].


灰枝鸦葱 hui zhi ya cong

Scorzonera tuberosa Pallas var. sericeolanata Bunge, Beitr. Fl. Russl. 200. 1852; **S. rubroviolacea** Godzwinski.

Herbs 8–20 cm tall, perennial, with a globeo tuber some cm below surface. Stems solitary or few, weak, erect, sparsely branched, white sericeous pubescent. Basal leaves few, linear, 5–20 × 0.2–0.8 cm, arachnoid hairy, glabrescent, or adaxially glabrous, base attenuate, margin flat, apex acuminate. Stem leaves similar to basal leaves but base ± amplexicaul. Synflorescence laxly corymbiform, with 5–7 capitula. Involucre narrowly cylindric to obconic, ca. 6 mm in diam. Phyllaries abaxially densely pubescent; outermost phyllaries narrowly triangular, apex acute. Flores yellow. Corolla with purplish red veins. Achene cylindric, 5–7 mm, densely sericeous. Pappus whitish, usually 1–1.2 cm. Fl. and fr. Apr–Jun.

Deserts, semiconsolidated sand dunes; 300–1400 m. Xinjiang [Kazakhstan, Russia (SW Asian part), Uzbekistan].

C. H. An (in Fl. Xinjiang. 5: 401. 1999) also reported the similar and related **Scorzonera tuberosa** Pallas for Xinjiang. That species is distributed in E and S European Russia and Kazakhstan and had not been reported before from farther east. The corresponding material has not been seen by the present authors, and the report needs confirmation.


披波球根鸦葱 zhou bo qiu gen ya cong

Herbs (8–)15–25 cm tall, perennial, with a globeo tuber some cm below surface. Caudex rather inconsiderable, reddish brown lanate, with few scarious leaf sheath residues. Stems 1–3, erect, weak, sparsely branched apically, densely pubescent. Basal leaves few, broadly lanceolate, usually 5–15 × 0.8–1.5 cm, densely tomentose, base attenuate, margin undulate, apex acute to acuminate and often curled. Stem leaves similar to basal leaves but not basally attenuate. Synflorescence sparsely corymbiform, with 2 or 3 capitula. Involucre narrowly cylindric to obconic. Phyllaries abaxially densely pubescent; outermost phyllaries triangular-ovate to lanceolate. Flores yellow, purplish red when dry. Achene cylindric, 5–7 mm, densely sericeous. Pappus brownish, ca. 9 mm. Fl. and fr. Apr–May. 2n = 12.

Stony slopes, mountain plains; ca. 1100 m. Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].

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**52. PODOSPERMUM** Candolle in Candolle & Lamarck, Fl. Franç. 4: 61. 1805, nom. cons.

柄果菊属 bing guo ju shu

Shi Zhu (石铸 Shih Chu); Norbert Kilian

Arachnospermum F. W. Schmidt.

Herbs, [annual or] biennial or perennial, often with woody caudex and rosulate. Leaves pinnately divided, base with semiamplexicaul usually persistent sheath. Involute cylindric, usually distinctly prolonged toward fruiting. Phyllaries in several series, often...
subapically corniculate. Receptacle naked. Achene with conspicuous cylindric carpopodium usually 1/5–1/3 as long as achene body. Pappus of strong bristles; bristles softly fimbriately plumose for most of length and apically scabrid.

About 17 species: N Africa, C and SW Asia, Europe; one species in China.

Molecular phylogenetic analyses by Mavrodiev et al. (Taxon 53: 699–712. 2004) revealed that Scorzonera in its wider sense is polyphyletic and provided support for the recognition of Podospermum as a separate genus.


Herbs usually 15–40 cm tall, biennial to perennial?, rosulate, glabrous or sparsely arachnoid hairy. Caudex with complete leaf sheath residues. Stems few, sparsely branched apically, sparsely leafy. Rosette leaves linear-elliptic or narrowly elliptic to elliptic, pinnatifid or pinnatisect, sometimes not divided, base attenuate and petiole-like; middle lobes few, in middle third of blade, linear, linear-lanceolate, or narrowly elliptic, to 1 cm; terminal lobe much longer than lateral lobes, narrowly elliptic, linear-elliptic, or linear. Stem leaves linear-elliptic to linear, mostly undivided. Synflorescence sparsely corymbiform, with few capitula. Capitula long pedunculate. Involucre cylindrical, 1–1.2 × 0.5–0.6 cm at anthesis, to 2 × 1 cm in fruit. Phyllaries sparsely arachnoid hairy and glabrescent, often subapically corniculate; outer phyllaries narrowly triangular to lanceolate, longest ca. 1/2 or more as long as inner linear-lanceolate phyllaries. Florets yellow, slightly longer than involucre. Achene gray, cylindrical, 1–1.2 cm, ribs smooth, carpodium 1/5–1/4 as long as achene body. Pappus dirty white, 1.1–1.2 cm. Fl. and fr. May–Jun. 2n = 14, 28.

Steppes; ca. 1000 m. Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].

No material of Podospermum songoricum from China has been seen by the present authors, but its presence in Xinjiang is confirmed by C. H. An (Fl. Xinjiang. 5: 389. 1999). The description is based on Lipschitz (Fl. URSS 29: 40. 1964) and material from neighboring countries.


蝎尾菊属 xie wei ju shu
Shi Zhu (石铸 Shih Chu); Norbert Kilian


Five species: N Africa, C, S, and SW Asia, S Europe; one species in China.


Rhagadiolus koelpinia Willdenow.

Herbs 5–35 cm tall. Stem solitary, slender, branched from base, glabrous or sparsely pilosulous, remotely leafy. Stem leaves linear to filiform, 4.5–15 × 0.1–0.5(–0.7) cm, glabrous or subglabrous. Synflorescence diffusely racemiform to paniculate, with 2–5 capitula or capitulum solitary. Capitula with 5–9 florets. Involucre at anthesis cylindric, 5–7 mm. Phyllaries glabrous or sparsely hairy, apex acute; outer phyllaries 2 or 3, narrowly triangular, ca. 2 × 0.5 mm; inner phyllaries 5, linear-lanceolate. Florets yellow, not or slightly exceeding involucre. Achene brownish, columnar-scorpioid, ca. 1 cm, abaxially with antrorse and apically with retrorse rigid hooked needlelike spines. Fl. and fr. Feb–Jul. 2n = 14, 36, 40, 42, 54, 56.

Gravelly deserts; 400–1000 m. Xinjiang, SW Xizang [Afghanistan, NW India, Kashmir, Kazakhstan, Kyrgyzstan, Pakistan, Russia (S European part), Tajikistan, Turkmenistan, Uzbekistan; N Africa, SW Asia, SW Europe].

54. EPILASIA (Bunge) Bentham in Bentham & J. D. Hooker, Gen. Pl. 2: 532. 1873.

鼠毛菊属 shu mao ju shu
Shi Zhu (石铸 Shih Chu); Norbert Kilian


Herbs, annual, white pubescent or glabrous. Leaves undivided. Involucre ovoid-cylindric to globose. Phyllaries in 2 rows; outer phyllaries herbaceous, leaflike, usually longer than [or equaling] inner phyllaries; inner phyllaries usually 5. Receptacle naked. Florets pale yellow [or pale red or blue]. Achene blackish [or gray], ± cylindric, ribbed, ribs smooth or spinulose, base with somewhat broadened hollow cylindric carpophore, glabrous, apex truncate or apical half conic, unribbed, and covered and hidden by caplike pappus disk with pappus. Pappus arising from flat of caplike conic pappus disk, grayish or brownish, of soft bristles in several rows, persistent, very densely long lanately softly fimbriately plumose, longer bristles apically scabrid.
About three species: C and SW Asia; two species in China.


1a. Apex of achene crowned with flat pappus disk and pappus ……………………………………………………………………… 1. **E. acrolasia**

1b. Apical half of achene hidden by conic caplike pappus disk and pappus …………………………………………………………… 2. **E. hemilasia**

2. **Epilasia hemilasia** (Bunge) C. B. Clarke ex Tzvelev; **S. ammophila** Bunge.

Herbs 6–25 cm tall, annual. Stem erect, moderately branched often already from base or more rarely unbranched, arachnoid hairy, glabrescent, leafy. Leaves narrowly spatulate, narrowly lanceolate, broadly lanceolate, or rarely ovate-lanceolate, 1–4(–5) × 0.2–1(–2) cm, ± arachnoid hairy, base attenuate and finely semiamplexicaul, margin flat or somewhat undulate and densely microdentate, apex acute to acuminate or more rarely obtuse. Synflorescence diffuse, panicleiform to corymbiform, with several capitula or more rarely capitulum solitary. Involucre ovoid-cylindric to globose, 1.2–1.4 × 0.8–1 cm at anthesis, 1.5–1.7 × ca. 1.5 cm in fruit (outer phyllaries not counted). Outer phyllaries linear-lanceolate, usually 2–3.5 cm, herbaceous, similar to upper stem leaves, distinctly longer than inner phyllaries; inner phyllaries lanceolate, leathery, margin somewhat scarious, apex obtuse to acute. Florets pale yellow [or purplish], to 1.3 × as long as involucre. Achene blackish, ± concolorous, cylindrical, 4–5 cm, with hollow cylindrical 1–1.5 mm carpophore, usually with 5 smooth or somewhat spinulose main ribs and ca. 10 secondary ribs. Pappus gray, usually 8–9 mm. Fl. and fr. May–Jun. 2n = 12.

Leeward slopes on sand dunes, clay and gravelly areas; 500–1000 m. Xinjiang [Afghanistan, Kazakhstan, Pakistan, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].


Herbs usually 5–50 cm tall, annual. Stem ascending to erect, unbranched or moderately branched often already from base, arachnoid hairy, glabrescent, basally densely and higher up distantly leafy. Leaves narrowly spatulate or narrowly lanceolate to linear-lanceolate, 2–9 × 0.3–1.5 cm, ± arachnoid hairy, base attenuate and finally semiamplexicaul, margin densely microdentate, apex acute to acuminate. Synflorescence diffuse, panicleiform to corymbiform, with several capitula or more rarely capitulum solitary. Involucre ovoid-cylindric to globose, 1.2–1.4 × 0.8–1 cm at anthesis, 1.5–1.7 × ca. 1.5 cm in fruit (outer phyllaries not counted). Outer phyllaries lanceolate, usually 2–4 cm, herbaceous and similar to upper stem leaves, distinctly longer than inner phyllaries, apex acuminate; inner phyllaries lanceolate, leathery, margin somewhat scarious, apex obtuse to acute. Florets pale yellow, slightly longer than involucre. Achene blackish, cylindrical, 6–7 mm, with hollow + cylindrical 1–2 mm carpophore, body in lower half with 10 pale narrow raised often somewhat spinulose ribs, upper half covered and hidden by conic caplike pappus disk and pappus. Pappus gray, 8–10 mm. Fl. and fr. Apr.–May. 2n = 12, 24.

Sand or clay areas, grasslands; 800–1500 m. Xinjiang [Afghanistan, Kazakhstan, Pakistan, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].

The unique achene of *Epilasia hemilasia* is interpreted here through a modification of the pappus disk. Normally the pappus disk is a ± flat disklike (or because of its central opening for the vascular strands connecting achene and floret actually rather ringlike) structure bearing the pappus bristles and crowning the achene apex. In this species, the pappus disk is modified to a caplike structure covering the equally fertile apical half of the achene. This interpretation is supported by the fact that the outer series of plumose pappus bristles arises from the callose ringlike structure in the middle third of the achene (morphologically indistinguishable from the outer series of bristles on the pappus disk of *E. acrolasia*), while other bristles are basally shortly adnate to and then arise from the unribbed, pale brown surface between the callose ring and the achene apex, and the innermost series of ca. 5 bristles arises at the achene apex. The trichomes covering the surface between the bristles are considered as homologues to those at the base of the bristles in *E. acrolasia* and to the soft fimbriae of the plumose *Scorzonerinae* pappus in general.


婆罗门参属 po luo men shen shu

**Shi Zhu (石铸 Shih Chu); Alexander P. Sukhorukov, Evgeny V. Mavrodiev**

Herbs, perennial, biennial, or rarely annual, glabrous or tomentulose to floccose [or lanate] especially at leaf bases and below capitula, often glabrescent; if biennial then vertical roots spindle-shaped; if perennial then with well-developed caudex. Stem simple or sparingly branched. Leaves basal and cauline, sessile, linear, lanceolate, or narrowly oblong, margin entire or undulate. Capitulum terminal, solitary or sometimes capitula few to many, large, with (20–)40–180 or more florets; peduncle often apically inflated and normally without bracts. Involucre cylindric at anthesis, mostly 10–20 mm or more in diam. Phyllaries 5–15(or 16), in 1(or 2) row(s), linear-lanceolate, triangular-lanceolate, or linear, ± equal, abaxially glabrous [with intertwining hairs], margins white and narrowly pellucid, apex acute. Receptacle naked. Florets with ligules yellow, mauve, orange, purple, or violet. Achene dark to pale brown, straw-colored, or whitish, heteromorphic, outer ones ± cylindrical or curviform (fusiform), central ones cylindrical and less tuberculare or smooth; achene body normally tuberculate, with 5 fairly well-differentiated ribs, with or rarely without hollows in pericarp; beak
slender or stout if present; pappus disk ± pubescent. Pappus persistent, dirty white, yellowish, or slightly fulvous; awns 12–20 or more in 1 or 2 rows, unequal, softly fimbriately plumose, apically scabrid.

More than 150 species: mainly in C and SW Asia and S Europe; 19 species (two endemic, one introduced) in China.

1a. Outer achenes (without pappus) 3.7–4.5 cm; ligules violet; cultivated/alien biennial or annual plants ................ 11. *T. porrifolius*
1b. Outer achenes (without pappus) not more than 3.5 cm; ligules of various colors; non-cultivated perennial or biennial plants.

2a. Peduncle mostly reduced; small plants to 20 cm tall ........................................................................... 18. *T. verrucosobracteatus*
2b. Peduncle not reduced, always well developed; plants also taller.

3a. Pappus awns clearly unequal, longest 2–5 ca. 7 mm and remainder ca. 4 mm; achenes 1–1.3 cm, beakless ................................................................. 19. *T. heteropappus*
3b. Pappus awns slightly unequal, length ratio ca. 1.2:1; outer achenes longer than 2 cm.

4a. Peduncle with dark hairs; ligules violet; plants biennial ..................................................................... 17. *T. sibiricus*
4b. Peduncle glabrous or tomentulose to floccose; florets of various colors; plants biennial or perennial.

5a. Perennial polycarpics 10–35(–40) cm tall; ligules mauve, violet, purplish, rarely (*T. gracilis*) adaxially yellow but then abaxially with pink or mauve spot.

6a. Outer achenes (without pappus) 1–2 cm, body pale brown, 1.2–1.6 mm in diam., and terete or sometimes with 5 fairly well-differentiated ribs, beak slender, 0.2–0.6 mm in diam.; hollows in pericarp 40–50 µm in diam.; pappus dirty white; plants to 20(–30) cm tall.
6b. Outer achenes (without pappus) (1.8–)2–2.7(–3) cm, body whitish or sometimes with a tinge of red, (1.7–)1.8–2.6 mm in diam., and always with 5 fairly well-differentiated ribs, beak stout, 0.9–1.1 mm in diam.; hollows in pericarp more than 60 µm in diam.; pappus fulvous or fulvous tinged with red; plants (15–)20–40 cm tall.

7a. Ligules adaxially yellow, abaxially with a pink or mauve spot; pappus always slightly longer than achene body ................................................................. 9. *T. gracilis*
7b. Ligules reddish purple; pappus equaling or slightly shorter than achene body ................................ 10. *T. subalpinus*

8a. Achene:pappus ratio ca. 1.5:1; basal leaves lanceolate ................................................................. 14. *T. elongatus*
8b. Achene:pappus ratio 1–1.2:1; basal leaves oblanceolate or elliptic.

9a. Peduncle apically distinctly inflated ........................................................................ 12. *T. kasachstanticus*
9b. Peduncle apically ± not inflated.

10a. Plants glabrous ............................................................................................................. 16. *T. montanus*
10b. Plants tomentulose to floccose.

11a. Beak of outer achenes well differentiated from body ........................................ 13. *T. marginifolius*
11b. Beak of outer achenes slightly differentiated from body ........................................ 15. *T. ruber*

5b. Biennial monocarpics 40–150 cm tall; ligules yellow or yellowish orange.

12a. Peduncle apically distinctly inflated.

13a. Outer achenes (without pappus) 2–2.3 cm, body 2–2.5 mm in diam., beak 2–5 mm and stout ........................................................................... 7. *T. sabulosus*
13b. Outer achenes (without pappus) more than 2.3 cm, body to 2 mm in diam., beak 0.7–1.7 cm and slender.

14a. Phyllaries 6–9 cm; outer achenes with pappus 5.5–7 cm ........................................ 1. *T. capitatus*
14b. Phyllaries 4–5.5(–6) cm; outer achenes with pappus 4.4–6 cm.

15a. Number of phyllaries 5–8 .......................................................... 2. *T. pseudomajor*
15b. Number of phyllaries (8–)10–12(–14) ...................................................... 3. *T. dubius*

12b. Peduncle apically not or only slightly inflated.

16a. Outer achene with beak to 3 mm or without beak; plants floccose ........................................... 8. *T. stepposus*
16b. Outer achene with beak more than 5 mm; plants glabrous.

17a. Phyllaries slightly longer than florets ........................................................................ 4. *T. songoricus*
17b. Phyllaries shorter than florets.

18a. Ligules yellowish orange; outer achenes (without pappus) ca. 1.7 cm ............ 5. *T. altaicus*
18b. Ligules pure yellow; outer achenes without pappus (1.8–)2–2.5 cm ..... 6. *T. orientalis*
tuberculate; beak whitish, 1.5–2.2 cm, slender, non-tuberculate or toothed, apically inflated; pappus disk ± tomentulose. Pappus dirty white, 2.5–3.5 cm. Fl. and fr. Apr–Jun. 2n = 12.

Stony steppes, grassy slopes, base of mountains, ditches, roadsides; 500–2000 m. Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan].


北疆婆罗门参 bei jiang po luo men shen

Herbs 40–80(–100) cm tall, biennial. Stem simple or branched from lower or middle third, erect, glabrous. Basal and lower cauline leaves linear to lanceolate, 15–30 × 0.3–0.5 cm. Capitula solitary to few; peduncle inflated, 7–11 mm in diam. Involucre 4–5.5 cm at anthesis, to 7 cm in fruit. Phyllaries (5–)7 or 8, longer than florets, equaling or longer than achenes with pappus. Ligules yellow. Outer achenes 2.4–3 cm; body pale brown, ± curviform, (1.5–)1.7–2 mm in diam., with 5 fairly well-differentiated ribs, tuberculate; beak whitish, 1.7–1.8 cm, slender, non-tuberculate or toothed, apically ± inflated; pappus disk ± pubescent. Pappus dirty white, 2.2–2.3 cm. Fl. and fr. Apr–Jun.

Meadows, river valleys, dry mountain slopes, plateaus; 1000–2000 m. Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].


霜毛婆罗门参 shuang mao po luo men shen

Herbs 40–80(–100) cm tall, biennial. Stem erect, simple or branched from lower or middle third, glabrous. Basal and lower cauline leaves lanceolate to linear, 15–40 × 0.3–0.5 cm. Capitula solitary to few; peduncle inflated, 7–10 mm in diam. Involucre 4–5.5 cm at anthesis, to 7 cm in fruit. Phyllaries 8–12(–14), longer than florets, equaling or longer than achenes with pappus. Ligules yellow. Outer achenes 2.2–3 cm; body pale brown, ± curviform, (1.4–)1.7–2 mm in diam., with 5 fairly well-differentiated ribs, tuberculate; beak whitish, 1.2–1.6 cm, slender, non-tuberculate or toothed, apically inflated; pappus disk subpapose. Pappus dirty white, 2.2–2.8 cm. Fl. and fr. Apr–Jun. 2n = 12.

Stony steppes, grassy slopes at base of mountains, ditches; 500–2000 m. Xinjiang [Kazakhstan, Mongolia, SC Russia].


准噶尔婆罗门参 zhun ga er po luo men shen

Herbs 40–80 cm tall, biennial. Stem erect, branched from middle third or above, glabrous. Basal and lower cauline leaves linear, 15–30 × 0.2–0.5 cm. Capitula solitary to few; peduncle not inflated, 3–5 mm in diam. Involucre 2.5–3.5 cm. Phyllaries 7 or 8(–9), equaling or longer than florets, equaling or shorter than achenes with pappus. Ligules yellow, often light blue when dry. Outer achenes 1.8–2.2 cm; body pale brown, ± curviform or almost straight, 1.5–1.8 mm in diam., with 5 fairly well-differentiated ribs, tuberculate; beak whitish, 7–10 mm, abruptly differentiated from body, slender, non-tuberculate or toothed, apically ± inflated; pappus disk pubescent. Pappus dirty white, 1.5–2 cm. Fl. and fr. Jun–Aug.

Forest margins, semi-deserts; 500–2200 m. Xinjiang [Kazakhstan, Mongolia, SC Russia].


阿勒泰婆罗门参 a le tai po luo men shen

Herbs, 40–120 cm tall, biennial. Stem erect, strongly branched, glabrous. Basal and lower cauline leaves lanceolate, 15–40 × 0.4–1(–1.3) cm. Capitula few to many; peduncle not inflated, 3–5 mm in diam. Involucre 2.5–3 cm. Phyllaries 7–9(or 10), ca. 2.3 as long as florets, equaling achenes with pappus. Ligules yellowish orange. Outer achenes 1.3–1.8 cm; body pale brown, ± curviform or almost straight, 1.4–1.6 mm in diam., not ribbed and slightly tuberculate; beak pale, 2–6 mm, slender, smooth, apically not inflated; pappus disk ± pubescent. Pappus dirty white, 1–1.5 cm. Fl. and fr. Jun–Aug.

Mountain meadows, stony slopes in hills; 1500–3000 m. Xinjiang [Kazakhstan, Mongolia, SC Russia].

Tragopogon altaicus has previously been mistaken by C. H. An (Fl. Xinjiang. 5: 380. 1999) for T. pratensis Linnaeus, which is not present in China.


东方婆罗门参 dong fang po luo men shen

Herbs 40–100 cm tall, biennial. Stem erect, normally branched, glabrous. Basal and lower cauline leaves linear to lanceolate, 15–30 × 0.3–1 cm. Capitula solitary to few; peduncle not inflated. Involucre 2–3.5 cm. Phyllaries 7–9(or 10), 1.3–1.5 × as long as florets, equaling or shorter than achenes with pappus. Ligules golden yellow. Outer achenes 1.8–2.5 cm; body pale brown, ± curviform or almost, 1.4–1.6 mm in diam., tuberculate; beak whitish, 0.8–1.3 cm, slender, non-tuberculate, apically almost not inflated; pappus disk ± pubescent. Pappus dirty white, 1.5–2.5 cm. Fl. and fr. May–Jul. 2n = 12×.

● Mountain meadows; 1000–2100 m. Xinjiang.

The identity of Tragopogon orientalis var. latifolius needs to be confirmed, including whether or not it belongs to T. orientalis. The overall distribution of T. orientalis outside of China includes Kazakhstan, Mongolia, and Russia, as well as Europe and North America.


沙婆罗门参 sha po luo men shen

Herbs 50–150 cm tall, biennial. Stem erect, branched from middle third, glabrous. Basal and lower cauline leaves linear to lanceolate, 15–40 × 0.5–1 cm. Capitula few to 10(–12); peduncle inflated under capitulum, 5–10 mm in diam. Involucre 3.5–5(–6) cm. Phyllaries 8–10(–12), smaller than florets and achenes with pappus. Ligules yellow. Outer achenes 2–2.5 cm; body pale brown, slightly curviform or straight, 2–2.5 mm in diam., tuberculate, with 5 fairly well-differentiated ribs; beak 2–5 mm, attenuate or stout, with inflated apex; pappus disk floccose. Pappus dirty white, 2–2.7 cm. Fl. and fr. May–Jul.

Sand dunes; 800–1500 m. Xinjiang [Kazakhstan, SC Russia].

草原婆罗门参  cao yuan po luo men shen


Herbs 40–80(--100) cm tall, biennial. Stem erect, branched from middle third, pubescent. Basal and lower cauleine leaves lanceolate-subulate, 7–15 × 0.2–0.4 mm, margin sometimes adaxially rounded. Capitulum solitary; peduncle not inflated. Involucre 1.5–2.5 cm. Phyllaries 7 or 8, ± equaling florets and achenes with pappus. Ligules yellow. Outer achenes 1–1.3 cm; body pale brown, slightly curviform, or shorter than florets and achenes with pappus. Ligules bicolored, abaxially with pink or mauve spot, adaxially rounded. Capitulum solitary; peduncle not inflated. Involucre 1.5–2 cm. Phyllaries 7 or 8, ± equaling florets and ± equaling achenes with pappus. Ligules violet. Outer achenes 3.7–4.5 cm; body pale brown, curved, 1.4–1.6 mm in diam.; beak whitish, 2–2.5 cm, smooth, apically inflated; pappus disk ± tomentulose. Pappus dirty white, 2.7–3.7 cm. Fl. and fr. May–Aug. 2n = 12.

700–2000 m. Naturalized or cultivated in Beijing, Guizhou, Shaanxi, Sichuan, Xinjiang, and Yunnan [native to Europe].

*Tragopogon porrifolius* is naturalized in S Africa, Asia, Australia, North America, and perhaps Oceania.

This is a polyphyletic taxon. The relationship of Chinese plants requires more investigation.


纤细婆罗门参 xian xi po luo men shen

Herbs to 20(–30) cm tall, perennial. Caudex stout. Stems few, simple, slender, erect, glabrous. Basal and lower cauleine leaves lanceolate-subulate, 7–15 × 0.2–0.4 mm, margin sometimes adaxially rounded. Capitulum solitary; peduncle not inflated. Involucre 1.8–2.3 cm at anthesis, to 3.5 cm in fruit. Phyllaries 5–7, shorter than florets and ± equaling achenes with pappus. Ligules bicolored, abaxially with pink or mauve spot, adaxially yellow. Outer achenes 1.3–1.8 cm; body pale brown, slightly curviform, 1.3–1.6 mm in diam., slightly tuberculate, with small (to 40–50 µm in diam.) hollows in pericarp; beak slender, 5–7 mm. Pappus dirty white, 1.5–2 cm. Fl. and fr. Apr–Jun. 2n = 12, 24.

Mountain slopes, river terraces; 2500–3500 m. Xinjiang, Xizang, Shaanxi, Sichuan, Xinjiang, and Yunnan [native to Europe].


高山婆罗门参 gao shan po luo men shen

Herbs to 10(–25) cm tall, perennial. Caudex stout. Stems few, simple, slender, erect, glabrous. Basal and lower cauleine leaves linear-lanceolate, 10–20 × 0.4–1 cm. Capitulum solitary to few; peduncle not inflated. Involucre 1.5–2.5 (–3.5) cm. Phyllaries 7 or 8, ± equaling florets and achenes with pappus. Ligules reddish purple. Outer achenes 1.3–1.7 cm; body pale brown, straight or slightly curviform, 1.2–1.4 mm in diam., smooth or slightly tuberculate, with small (to 40–50 µm in diam.) hollows in pericarp; beak slender, ca. 6 mm. Pappus dirty white, ca. 1.5 cm. Fl. and fr. Jun–Jul.

Mountain grasslands; 3000–3500 m. Xinjiang [Kazakhstan, Kyrgyzstan].


蒜叶婆罗门参 suan ye po luo men shen

Herbs 40–125 cm tall, biennial or annual. Stem erect, simple or branched from middle third, glabrous or slightly tomentulose. Basal and lower cauleine leaves lanceolate or linear, 15–40 × 0.3–0.7 cm, marginally often undulate, 6–12 mm in diam.; peduncle inflated. Capitula solitary to few. Involucre 4–5 cm at anthesis, to 8 cm in fruit. Phyllaries 7 or 8, ca. 1/3 longer than florets and ± equaling achenes with pappus. Ligules yellow. Outer achenes 3.7–4.5 cm; body pale brown, curved, 1.4–1.6 mm in diam.; beak whitish, 2–2.5 cm, smooth, apically inflated; pappus disk ± tomentulose. Pappus dirty white, 2.7–3.7 cm. Fl. and fr. May–Aug. 2n = 12.

Stony slopes, sandy deserts; 800–1400 m. Xinjiang [Kazakhstan, Kyrgyzstan, Russia (E and S European parts), Uzbekistan].


中亚婆罗门参 zhong ya po luo men shen

Herbs 20–35 cm tall, perennial. Caudex stout. Stem single, erect, branched from middle third, glabrous, ± lanate, tomentulose, or glabrescent at nodes and below capitula. Basal and lower cauleine leaves lanceolate to narrowly oblong, abaxially keeled, sometimes folded along midvein. Capitula solitary to few; peduncle ± inflated, 4–8 mm in diam. Involucre ca. 3 cm at anthesis, 4.5–5 cm in fruit. Phyllaries 8, equaling or shorter than florets. Ligules purple to violet. Outer achenes 2.2–2.7 cm; body whitish, straight to ± curved, 1.8–2.2 mm in diam., tuberculate, with 5 fairly well-differentiated ribs; beak 3–5 mm, stout, apically ± inflated; pappus disk ± tomentulose. Pappus slightly fulvous, 2.2–2.5 cm. Fl. and fr. Apr–June.

Mountain slopes, river valleys, sandy soils; 500–2000 m. Xinjiang [Kazakhstan, Kyrgyzstan].


膜缘婆罗门参 mo yuan po luo men shen

*Tragopogon gonocarpus* S. A. Nikitin.

Herbs 20–35 cm tall, perennial. Caudex stout. Stem single, erect, simple or branched from middle third or higher, glabrous or tomentulose/floccose at nodes and below capitula. Basal and lower cauleine leaves lanceolate to narrowly oblong, 10–30 × 0.5–2 cm, margin white, ± undulate and membranous. Capitula solitary to few; peduncle not inflated. Involucre 2.5–4 cm. Phyllaries 8, lanceolate, shorter than or equaling florets and achenes with pappus. Ligules purple to mauve. Outer achenes 2–2.5 cm; body whitish, straight to ± curved, 2–2.5 mm in diam., tuberculate, with 5 fairly well-differentiated ribs; beak 3–5 mm, stout, apically ± inflated; pappus disk ± tomentulose. Pappus slightly fulvous, often with tinge of red, 2–2.5 cm. Fl. and fr. Apr–Jun. 2n = 12.

Stony slopes, semi-deserts; 800–1400 m. Xinjiang [Kazakhstan, Kyrgyzstan, Russia (E and S European parts), Uzbekistan].

长茎婆罗门参 chang jing po luo men shen

Herbs 15–35 cm tall, perennial. Caudex stout. Stem single, erect, simple or branched from middle or upper third, glabrous or tomentulose/floccose at nodes and below capitula. Basal and lower cauleine leaves lanceolate, 10–20 × 4–8 cm, margin membranous and sometimes ± crisp. capitula solitary to few; peduncle not inflated. Involucre 2–3 cm. Phyllaries 7 or 8, often darkly colored. Ligules purple to mauve. Outer achenes 1.8–2.2 cm; body whitish, straight to ± curved, 2–2.5 mm in diam., tuberculate, with 5 fairly well-differentiated ribs; beak 7–10 mm, stout, apically ± inflated; pappus disk ± tomentulose. Pappus slightly fulvous, 2–2.5 cm. Fl. and fr. Apr–Jun. 2n = 12.

Mountains; 1200–2500 m. Xinjiang [Kazakhstan, Kyrgyzstan, SC Russia, Tajikistan, Uzbekistan; SW Asia].


红花婆罗门参 hong hua po luo men shen

Tragopogon ruber var. leucocarpus C. H. An.

Herbs 15–35 cm tall, perennial. Caudex stout. Stem single, erect, simple or branched from middle third or above, glabrous or tomentulose/floccose at nodes and below capitula. Basal and lower cauleine leaves lanceolate to oblong, 10–30 × 0.5–2 cm, margin white, ± undulate, and membranous. capitula solitary to few; peduncle not inflated. Involucre 3.5–6 cm. Phyllaries 8, lanceolate, equaling or shorter than florets and achenes with pappus. Ligules purple to mauve. Outer achenes 1.8–2.4 cm; body smooth or subtuberculate on 5 fairly well-differentiated ribs; beak 0.6–1.4 cm, slender, ± inflated; pappus disk ± tomentulose. Pappus dirty white, 1.5–2 cm. Fl. and fr. Jun–Aug. 2n = 12.

Forest margins; ca. 1700 m. Xinjiang [Russia (W Asian and E European parts)].


山地婆罗门参 shan di po luo men shen

Herbs 30–50 cm tall, perennial. Stem simple. Basal and lower stem leaves lanceolate to linear, 15–40 × 0.4–2 cm, margin flat. capitula solitary to few; peduncle with dark hairs, ± inflated. Phyllaries 8 or 9, ca. 1/3 longer than florets and equaling achenes with pappus. Ligules violet. Outer achenes 1.8–2.4 cm; body smooth or subtuberculate on 5 fairly well-differentiated ribs; beak 5–10 mm, stout, apically ± inflated; pappus disk ± tomentulose. Pappus slightly fulvous, often with tinge of red, 2–2.5 cm. Fl. and fr. Apr–Jun. 2n = 12.

Mountains, sand dunes; 500–1500 m. Xinjiang [Kazakhstan, Russia (S European part)].


西伯利亚婆罗门参 xi bo li ya po luo men shen

Herbs 0.5–1 m tall, biennial. Stem erect, simple or branched from middle third, glabrous. Basal and lower cauleine leaves lanceolate to linear, 15–40 × 0.4–1 cm, margin flat. capitula solitary to few; peduncle with dark hairs, ± inflated. Phyllaries 7 or 8, ca. 1/3 longer than florets and equaling achenes with pappus. Ligules purple. Outer achenes 1–1.3 cm; body smooth or subtuberculate on 5 fairly well-differentiated ribs; beak 0.6–1.4 cm, slender, ± inflated; pappus disk ± tomentulose. Pappus dirty white, 1–2 cm. Fl. and fr. Jun–Aug.

● Semi-deserts, stony places; ca. 500 m. Xinjiang.


瘤苞婆罗门参 liu bao po luo men shen

Herbs to 20 cm tall, perennial. Stem simple, densely covered with lanceolate or linear leaves, gradually decreasing in size toward apex. capitula solitary; peduncle mostly reduced, not inflated. Phyllaries 8(–10), lanceolate. Ligules yellow. Outer achenes 1.5–2 cm, beakless. Pappus dirty white, ca. 2 cm. Fl. and fr. Jun–Aug.

● Semi-deserts, stony places; ca. 500 m. Xinjiang.

Tragopogon verrucosobracteatus is poorly known and requires more investigation.


长苞婆罗门参 chang bao po luo men shen


● Semi-deserts, stony places; 1000–1300 m. Xinjiang.

Tragopogon heteropappus is poorly known and requires more investigation.


花佩菊属 hua pei ju shu

*Faberiopsis* C. Shih & Y. L. Chen.

Herbs, perennial, often rosulate, with rhizomes. Stem leafy or ± leafless. Leaves lyrate-pinnate or undivided, leathery. Capitula
with 5–30 florets. Involucre ± narrowly cylindric to ± narrowly campanulate. Phyllaries mostly glabrous; outer phyllaries in several series, gradually longer centripetally, often conspicuously imbricate, longest ca. 1/2 as long as inner ones; inner phyllaries 5–14, ± equal in length, ± linear-lanceolate to linear. receptacle naked. Florets reddish to bluish purple. Achenes brown to reddish brown, subcylindric to narrowly ellipsoid, rather weakly compressed, with 5 main ribs and 1 or 2 narrower ribs in between, apex truncate. Pappus brownish, single, of strong scabrid bristles.

- Seven species: China.

Systematic placement and circumscription of the genus have been revised based on molecular phylogenetic analyses of subtribes Lactucinae and Crepidinae (J. W. Zhang & N. Kilian, in prep.; N. Kilian et al., in prep.). N. Kilian et al. (in V. A. Funk et al., Syst. Evol. Biogeogr. Compositae, 348–350, 2009) placed Faberia in subtribe Crepidinae, but now ITS phylogenies show it on a very basal branch in subtribe Lactucinae. Recent additions to the genus by Senikov (Komarova 5: 109–110, 2008) are based on a different genus concept and are, as far as relevant for the flora of China, not supported. Karyological studies (Y. Liu, T. Deng & Q. E. Yang, pers. comm.) have revealed that the four species investigated have the unusual basic chromosome number of x = 17, perhaps indicating a hybrid origin of this genus.

*Prenanthus glandulosus* Dunn (J. Linn. Soc., Bot. 35: 514. 1903), which was initially placed by the first author in *Notoseris* (*N. glandulosus* (Dunn) C. Shih), is only known from the holotype at K, a piece of a flowering plant raised from seeds collected in “West China.” It seems to be a distinct species, perhaps referable to *Faberia*, as may be assumed from the involucre (purplish, inner phyllaries ca. 6, outer ones linear as in *F. lancifolia*), the 10–12 blue (or purple?) florets, and the pale straw-colored pappus. The lower leaves have a broadly ovate blade with cordate base and a distinct, basally sheathlike widened and clasping petiole. The axes of the paniculiform to corymbiform synflorescence are densely glandular hairy, a feature otherwise not known from *Faberia*.

1a. Leaves lyrate pinnatifid to lyrate pinnatisect.

2a. Leaves with terminal lobe much larger than lateral lobes, to 2/3 of entire leaf; involucre 1.4–1.5 cm; inner phyllaries usually 12–14; capitula with 20–30 florets ................................................. 3. *F. sinensis*

2b. Leaves with terminal lobe not conspicuously larger than lateral lobes; involucre 1.1–1.3 cm; inner phyllaries ca. 8; capitula with 10–15 florets ......................................................... 4. *F. ceterach*

1b. Leaf blade not divided or at most coarsely sinuate-dentate.

3a. Leaf blade lanceolate to narrowly elliptic or oblanceolate, at least ca. 3 × as long as wide.

4a. Capitula many in a leafless narrowly paniculiform synflorescence ............................................. 1. *F. lancifolia*

4b. Capitula 1–3 on short branchlets subtended by upper stem leaves ........................................... 2. *F. nanchuanensis*

3b. Leaf blade broadly elliptic, ovate, or pentagonal, mostly not more than ca. 2 × as long as wide.

5a. Leaves on stem, with petiole usually shorter than blade; leaf blade triangular-ovate to pentagonal; capitula with 5 florets; inner phyllaries 5 .................................................. 7. *F. faberi*

5b. Most leaves basal, with petiole distinctly longer than blade; leaf blade broadly elliptic to ovate; capitula with 10–20 florets; inner phyllaries at least 8.

6a. Leaf blade mostly more than 5 cm; synflorescence corymboform, with some capitula; florets bluish purple ........................................................................................................ 5. *F. cavalieri*

6b. Leaf blade at most ca. 4 cm; synflorescence sparsely branched, with 1–4 capitula only; florets purplish, drying yellowish ........................................................................ 6. *F. thibetica*


*Faberiopsis nanchuanensis* (C. Shih) C. Shih & Y. L. Chen.

- Crevices and ledges of cliffs by streams; 2100–2500 m. Yunnan (Tengchong).

*Faberia lancifolia* is a conspicuous but rare species, apparently only known from the type collection made in 1912.


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celate, otherwise like basal leaves, abaxially somewhat tinged purplish. Synflorescence of 1 to few short branchlets subtended by upper stem leaves, each with 1–3 capitula. Capitula with usually 15–20 florets. Involucre green and tinged purple, 1.1–1.3 cm. Phyllaries with apex obtuse to acute; outer phyllaries triangular-ovate to lanceolate, longest ca. 5 mm, margin ± ciliate; inner phyllaries usually 9–12, apically ciliate. Florets bluish purple. Achene not seen when mature. Pappus 7–8 mm. Fl. late; inner phyllaries usually 9–12, apically ciliate. Florets bluish purple. Achene not seen when mature. Pappus 7–8 mm. Fl.

- Wet places in ravines, on banks of pools and creeks; 600–700 m. Chongqing (Nanchuan).

C. Shih and Y. L. Chen (Acta Phytotax. Sin. 34: 439. 1996) described the ligule of the florets on the basis of the holotype as trisect with a larger 3-dentate middle segment and founded on this particularity the new genus Faberiopsis. Other collections of Faberia nanchuanensis; however, show the usual 5-dentate ligule of the Cichorieae, and both morphological and molecular data (J. W. Zhang et al., in prep.) corroborate its placement in Faberia. The species is morphologically closest to F. lanceolata.


- Wet places in ravines, on banks of pools and creeks; 600–700 m. Chongqing (Nanchuan).

Herbs 40–90 cm tall, perennial, rosulate. Rhizomes short, oblique, with many slender roots. Stem erect, branched apically and sparingly brown hairy, usually leafless except for linear bracts subtending branches. Rosette leaves 7–50 × 3.5–8 cm, lyrate-pinnatifid to lyrate-pinnatisect, abaxially pale green and brown hairy, adaxially green and glabrous; lateral lobes few to many, opposite or alternate along petiole-like basal portion, semiobtuse, semielliptic, or triangular-ovate, to 1 × 2.5 cm, gradually smaller toward leaf base; terminal lobe elliptic, ovate, or lanceolate, 4–40 cm, base cordate, rounded, or subtruncate, margin sinuate to lyrately lobed and distantly shortly mucronulately dentate, apex acuminate. Synflorescence corymbiform, with few to some capitula. Capitula with usually 10–20 florets; peduncle 1–7 cm, slender. Involucre 1.4–1.5 cm. Phyllaries apically tinged purple, ciliate at margin with brownish hairs, otherwise glabrous or inner phyllaries also abaxially sparingly hairy near apex, apex ± acute; outer phyllaries triangular-ovate to lanceolate, longest 5–6 mm; inner phyllaries usually 12–14. Florets purplish to bluish. Achene reddish brown, 3.5–4.5 mm. Pappus 7–8 mm. Fl. and fr. June–Aug. 2n = 34*.

- Forest margins, forests, moist places under rocks; 600–3200 m. Sichuan, Yunnan.

The entire plant of Faberia sinensis is used medicinally for promoting semen production.


Herbs 25–70 cm tall, perennial, rosulate, with rhizomes. Stem erect, basally brown hairy, apically branched and ± glabrous, leafless except for linear bracts subtending branches or with usually 1 or 2 leaves similar to rosette leaves. Rosette leaves narrowly elliptic to oblanceolate, 7–18 × 2–5 cm, lyrate-pinnatisect and basally with many slender roots. Stem erect, simple or sparingly branched, glabrous, not or very sparingly leafy. Basal leaves rosetulate; petiole 4–11 cm; leaf blade triangular-ovate, 2–4 × 1–3 cm, basecordate or unequally cordate, margin shallowly to coarsely sinuate-dentate, or irregularly coarsely dentate, apex acute to acuminate. Stem leaves similar to basal leaves but with shorter
petiole and smaller narrower blade. Synflorescence sparsely branched, with 1–4 capitula. Capitula nodding at anthesis, with usually 15–25 florets. Involucre ca. 1.5 cm. Phyllaries abaxially glabrous; outer phyllaries triangular-ovate to linear-lanceolate, longest 1/2–2/3 as long as inner phyllaries, apex acute; inner phyllaries 10–12, apex subacute. Florets purplish, drying yellowish. Achene brown, ca. 5 mm. Pappus ca. 8 mm. Fl. and fr. Jul. 2n = 34*.

- Grasslands on mountain slopes; ca. 2700 m. Sichuan (Kangding).

**Faberia thibetica** is rare and only known from a few collections.

7. Faberia faberi (Hemsley) N. Kilian, Z. H. Wang & J. W. Zhang, **comb. nov.**


Herbs 1.2–2.5 m tall, perennial. Rhizomes horizontal, 1–2 cm in diam. Stem solitary, erect, ± glabrous, leafy, apically with or without branches as leafy as main stem. Stem leaves with petiole 2–6 cm; leaf blade triangular-ovate to pentagonal, 8–15 × 5–12 cm, glabrous or very sparsely with stiff hairs, base hastate to cordate, margin shallowly sinuately mucronately dentate and mucronately denticulate, apex acute to acuminate; lower stem leaves rarely with a single pair of small, elliptic, entire, and subopposite to opposite lateral lobes. Synflorescences contracted panicleform, with some to many capitula; branches short, wiry, often pilose. Capitula rather clustered, each with ca. 5 florets; peduncle 0–2 mm. Involucre ca. 10 × 3 mm. Phyllaries green, ± shortly white ciliate; outer phyllaries broadly ovate-triangular, longest 2.5–3(–5) mm, apex acute; inner phyllaries 5, apex obtuse. Florets pale purple. Achene brown, 3.5–4 mm. Pappus 6–8 mm. Fl. and fr. Jun–Aug.

- Mountain slopes, forest margins; 1800–3000 m. Chongqing, Guizhou, Sichuan, Yunnan.

Molecular phylogenetic analyses by N. Kilian et al. (in prep.) fully confirm the morphological affinity to *Faberia of F. faberi*, previously classified under *Prenanthes* (e.g., *FRPS* 80(1): 189. 1997).

The syntypes of *Prenanthes vitifolia*, collected by Rosthorn in Chongqing in 1891 and conserved at O with the annotation in Diels's hand "*Prenanthes vitifolia Diels*" on the printed label of O, are evidence that *P. vitifolia* is conspecific with *Faberia faberi*. The sheet at O with the collection number "470" on an original handwritten label is designated here as the lectotype of the name *Prenanthes vitifolia* Diels.


岩参属 **yan shen shu**

Shi Zhu (石铸 Shih Chu); Norbert Kilian

*Cephalorrhynchus* Boissier; *Galathenium* Nuttall; *Mycelis* Cassini.

Herbs, perennial, often with rhizomes. Stem leafy. Leaves pinnate, lyrate-pinnate, or undivided. Capitula with 5–20[–30] florets. Involucre narrowly to broadly cylindric or campanulate. Phyllaries glabrous [or abaxially appressed hairy]; outer phyllaries in several series, generally longer centripetally, ± imbricate, longest ca. 1/2–3/4 as long as inner ones; inner phyllaries 5–10, ± equal in length, ± linear-lanceolate to linear. Receptacle naked. Florets bluish or purplish, exceptionally white. Achene some shade of brown, subeylindric, ± ellipsoid, or ± fusiform, weakly to distinctly compressed, with 5 main ribs (2 lateral and sometimes strongly enlarged, 1 median ventrally, and 2 median dorsally), also with 0–2 slender ribs in between main ribs, apex truncate, attenuate, or beaked. Pappus white, single of slender scabrid bristles or double and with an additional outer row of short hairs.

Probably ca. 20–30 species: C and SW Asia, Europe; seven species (five endemic) in China.

The circumscription of *Cicerbita* has been heavily in debate since its creation. The genus is used here in a revised circumscription inferred from most recent molecular phylogenetic and morphological studies of the entire subtribe (N. Kilian et al., in prep.), but its circumscription is still not settled, in particular concerning the species of C and SW Asia. Its concept with respect to the taxa occurring in China is therefore tentative and aims at keeping the nomenclatural changes to a minimum. Molecular phylogenetic analyses by N. Kilian et al. (in prep.) revealed that *Chaetoseris* as treated in FRPS (80(1): 266–283. 1997) is diphyletic. Whereas the larger part of the genus, including *C. lyriformis* (= *Melanoseris beesiana*), which provides the type of the generic name, is nested in the genus *Melanoseris*, the smaller part forms a distant clade close to *Cicerbita* (generic name typified by *C. alpina* Wallroth). The latter clade includes *Chaetoseris* sect. *Roborowska* *Tzvelev* (Rast. Tsentral. Azii 14b: 98. 2008) and *Cicerbita azurea*. We place this clade here tentatively in *Cicerbita*. We, moreover, follow *Tzvelev* (Bot. Zhurn. 92: 1756. 2007; Rast. Tsentral. Azii 14b: 100. 2008) in placing *Younga* sect. *Cyanoglossa*. S. W. Liu & T. N. Ho (originally with two species described by S. W. Liu & T. N. Ho, *Acta Phytotax. Sin.* 39: 553–556. 2001; further two species added by *Tzvelev*, loc. cit.: 2007) in close proximity to *Chaetoseris* sect. *Roborowska*. It was so far not possible to study material of any of these species, as the material was not made available on loan to us. We place this group (**Cicerbita**) tentatively in *Cicerbita*. Finally, we leave *Cicerbita thianschanica*, which has not been included so far in the aforementioned molecular phylogenetic studies, in *Cicerbita*.

1a. Plants robust, 0.6–1.5 m tall and synflorescence racemiform ................................................................. 1. *C. thianschanica*

1b. Plants mostly rather delicate, mostly less than 0.6 m tall but sometimes to 0.9 m tall and synflorescence paniculiform.

2a. Basal leaves and lower and middle stem leaves usually with triangular-ovate to orbicular leaf blade contracted into a well-developed long unwinged petiole; involucre 11–13 mm .............................................................................. 4. *C. azurea*

2b. Leaves not as above, or if basal leaves with triangular-ovate to orbicular leaf blade and well-developed petiole present then involucre ≤ 8 mm; involucre 6–10(–12) mm.

Herbs 0.6–1.5 cm tall, perennial. Rhizomes thick, woody. Stem solitary, erect, branched from middle or apically. Basal and lower stem leaves with petiole 8–9 cm, winged, semi-amplexicaul; leaf blade oblanceolate, to 16[–50] × 7–8[–9] cm, lyratey pinnatifid to pinnatisect, margin coarsely mucronately dentate; lateral lobes 2 or 3 pairs, elliptic; terminal lobe larger than lateral lobes, triangular-hastate, to 9 × 8 cm, apex acute to acuminate. Middle stem leaves sessile, auriculately clasping, similar to lower stem leaves. Upper stem leaves lanceolate to narrowly elliptic, smaller, less or not divided. Synflorescence narrowly racemiform to 50 cm, with many leaves lanceolate to narrowly elliptic, 4.5–16 × 1.5–6 cm, pinnatifid to pinnatisect or lyratey so, glabrous, margin entire or with few larger teeth; lateral lobes 2–7 pairs, lanceolate, elliptic, or linear, recurved, apex acute to obtuse; terminal lobe triangular-lanceolate to ovate-sagittate, linear, or lanceolate, apex acute to obtuse. Middle and upper stem leaves shortly petiolate or sessile; leaf blade elliptic to lanceolate, smaller, narrower, and less divided than lower leaves, base sagittately to auriculately clasping. Synflorescence paniculiform, with numerous capitula. Capitula with 10–12 florets. Involucre narrowly cylindric, (8–)9–10(–12) × 3–4 mm. Phyllaries glabrous or with subulate hairs, apex acute to obtuse; outer phyllaries triangular-ovate to linear-lanceolate, longest ca. 3/4 as long as inner phyllaries; inner phyllaries 8. Florets blue to purplish blue, rarely white. Achene 4–5 mm; body dark reddish to blackish brown, ellipsoid, compressed, with broad lateral ribs; beak greenish to brownish, 1–1.5 mm, slender. Pappus double, outer hairs ca. 0.2 mm, bristles ca. 7 mm. Fl. and fr. Jul.–Sep.

- Thickets, grasslands; 1900–4200 m. Gansu, Ningxia, Qinghai, Sichuan, Xizang.


Herbs 20–90 cm tall, perennial. Rhizomes very short. Stem solitary, erect, apically branched and glabrous or with white, stiff, subulate, and partly glandular hairs. Basal and lower leaves with winged petiole to 10(–15) cm; leaf blade narrowly obovate to elliptic, 4.5–16 × 1.5–6 cm, pinnatifid to pinnatisect or lyrate so, glabrous, margin entire or with few larger teeth; lateral lobes 2–7 pairs, lanceolate, elliptic, or linear, recurved, apex acute to obtuse; terminal lobe triangular-lanceolate, ovate-sagittate, linear, or lanceolate, apex acute to obtuse. Middle and upper stem leaves shortly petiolate or sessile; leaf blade elliptic to lanceolate, smaller, narrower, and less divided than lower leaves, base sagittately to auriculately clasping. Synflorescence paniculiform, with numerous capitula. Capitula with 10–12 florets. Involucre narrowly cylindric, (8–)9–10(–12) × 3–4 mm. Phyllaries glabrous or with subulate hairs, apex acute to obtuse; outer phyllaries triangular-ovate to linear-lanceolate, longest ca. 3/4 as long as inner phyllaries; inner phyllaries 8. Florets blue to purplish blue, rarely white. Achene 4–5 mm; body dark reddish to blackish brown, ellipsoid, compressed, with broad lateral ribs; beak greenish to brownish, 1–1.5 mm, slender. Pappus double, outer hairs ca. 0.2 mm, bristles ca. 7 mm. Fl. and fr. Jul.–Sep.

- Thickets, grasslands; 1900–4200 m. Gansu, Ningxia, Qinghai, Sichuan, Xizang.

### 3. Cicerbita auriculiformis (C. Shih) N. Kilian, comb. nov.


Herbs 45–80 cm tall, perennial. Stem solitary, erect, apically branched, glabrous. Lower stem leaves with petiole 6–11 cm, narrowly winged, ± clasping; leaf blade narrowly ovate, not divided or lyratey or non-lyratey pinnatisect; lateral lobes if present 1 or 2 pairs, obliquely ovate to oblong, recurved; terminal lobe 6.5–8.5 × 3.5–4.5 cm, base cordate, margin entire

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### Table 1

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<td><em>C. auriculiformis</em></td>
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### Table 2

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or shallowly sinuate-dentate, apex acute to obtuse. Middle and upper stem leaves similar to lower leaves but with broadly winged, sagittately to auriculately clasping petiole-like basal portion or sessile; lateral lobes 2–4 pairs, ca. 3 × 0.7–1 cm; terminal lobe triangular-hastate to lanceolate. Synflorescence paniculiform, with numerous capitula. Capitula with ca. 5 florets. Involute narrowly cylindric, 7–9 × ca. 2 mm. Phyllaries green, glabrous; outer phyllaries triangular-ovate to linear-lanceolate, longest ca. 1/2 as long as inner phyllaries; inner phyllaries 5. Florets bluish purple. Achenes ca. 4 mm; body elliptic, compressed, with broad lateral ribs; beak ca. 1 mm and thick. Pappus double, outer hairs 0.1–0.2 mm, bristles ca. 5 mm. Fl. and fr. Jul–Aug.

- Mountain slopes, along rivers, forests; 2000–2300 m. Gansu (Yuzhong), W Nei Mongol, Qinghai.

Cicerbita auriculiformis is closely related to C. roborowskii, although well distinct by its smaller capitula with only 5 inner phyllaries. This relationship was clearly expressed by S. W. Liu and T. N. Ho (Fl. Qinghai. 3: 312. 1996) when publishing it under the name Chaetoseris qiliangshanensis. However, the species had been known before, but it was, for its small capitula, misplaced in Stenosperis as S. auriculiformis (e.g., FRPS 80(1): 286. 1997).


岩参 yan shen

Sonchus azureus Ledebour, Fl. Altaic. 4: 138. 1833; Cicerbita azurea var. glabra Sennikov; C. glabra (Sennikov) Tzvelev; Lactuca azurea (Ledebour) Danguy; Mulgedium azureum (Ledebour) Candolle.

Herbs 30–60 cm tall, perennial. Rhizomes horizontal to oblique. Stem solitary, erect, branched apically, ± with brownish glandular hairs or glabrous. Basal and lower stem leaves with petiole 4.5–5.5(–18) cm, narrowly winged or unwinged, base ± expanded and semiamplexicau; leaf blade pinnatisect, axially sparsely villous but glabrescent, margin sinuate-dentate; lateral lobes 1 pair, elliptic-triangular to triangular; terminal lobe cordate, ovate, triangular-hastate, or rarely reniform, 2–8 × 1.5–6 cm, apex acuminate to rounded. Middle and upper stem leaves with winged petiole; leafblade smaller, lateral lobes 1 pair or absent. Synflorescence racemiform to more rarely paniculiform, with few to many capitula. Capitula with usually 11–18 florets. Involute cylindric, 1.1–1.3 × 0.4–0.6 mm. Phyllaries usually tinged deep violet, glandular hairy along midvein or glabrous; outer phyllaries lanceolate to linear-lanceolate, longest 6–9 mm; inner phyllaries 8–10, abaxially sparsely villous but glabrescent. Florets deep blue. Achenes pale brown, narrowly ellipsoid, 4–5 mm, weakly compressed, constricted for ca. 0.2 mm below pappus disk. Pappus double, outer hairs inconspicuous and ca. 0.1 mm, bristles 6–8 mm. Fl. and fr. Jul–Aug.

Forest margins, mountain slopes, open areas in forests, grasslands on flats; 600–2900 m. N Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, SC Russia].

5. Cicerbita zhenduoi (S. W. Liu & T. N. Ho) N. Kilian, comb. nov.

振铎岩参 zhen duo yan shen


Herbs 15–30 cm tall, perennial, rosulate. Rhizomes short. Stem erect, branched from base or higher up, glabrous or white pubescent. Rosette leaves glabrous or pubescent, margin ± entire. Early leaves with distinct 1.3–3 cm petiole; leaf blade triangular-ovate, 1–1.8 × 0.6–0.8 cm, base sagittate, truncate, or cuneate, apex obtuse to acute. Leaf blade of later rosette leaves elliptic to lanceolate, 4–8.5 × 0.3–0.8 cm, undivided to rarely weakly pinnatifid with few triangular lobes, base gradually attenuate, apex acute to long acuminate. Stem leaves similar to later rosette leaves, narrowly ovate-elliptic to narrowly lanceolate; uppermost leaves bractlike. Synflorescence loosely racemiform or paniculiform, glabrous or pubescent, with few to some capitula. Capitula with usually 4–7 florets. Involute narrowly cylindric, 6–8 × 1.5–2 mm. Phyllaries glabrous or pubescent; outer phyllaries ovate to lanceolate, longest ca. 4 × 1 mm, apex acute; inner phyllaries apically blackish purple, apex obtuse. Florets blue. Achenes fusiform and apically attenuate, ca. 4 mm, somewhat compressed. Pappus 4–5 mm. Fl. and fr. Sep.

- Moist slopes, riverbanks; 3600–3700 m. Qinghai (Yushu).

We have not seen material of Cicerbita zhenduoi; therefore, its inclusion follows Tzvelev (Rast. Tsentral. Aziz 14b: 100. 2008), and its description is taken from the original publication. We are not convinced that Youngia cyanea, described also from the environment of Jiangxi-gou, distinguished chiefly by the shape of the rosette leaves and the absence or presence of pubescence, represents a different species. From the variation experienced in the subtribe, the differences in either feature may well be within the usual range found. The corresponding combination under Chaetoseris provided by Tzvelev is illegitimate as a later homonym of Chaetoseris cyanea (D. Don) C. Shih, and the epithet is also not available in Cicerbita. Until closer study of the material, we prefer to treat both as conspecific.

6. Cicerbita ladyginii (Tzvelev) N. Kilian, comb. nov.

高原岩参 gao yuan yan shen


- 4000–4100 m. Xizang.

We have not seen material of Cicerbita ladyginii; therefore, its description is taken from the original publication.

7. Cicerbita neglecta (Tzvelev) N. Kilian, comb. nov.

光苞岩参 guang bao yan shen

Herbs 40–70 cm tall, perennial. Stem erect, branched from base or higher up. Basal leaves runcinately pinnate, with conspicuous terminal lobe. Lower stem leaves like basal leaves but others linear-lanceolate, undivided, base auriculately clasping, margin entire. Synflorescence divaricately paniculiform. Capitula with peduncle curved-erect, glandular hairy. Involucre narrowly cylindric, 9–10 mm. Phyllaries green, glabrous; outer phyllaries with longest 3–5 mm. Florets lilac. Achenes 3.5–4 mm; body reddish brown, with thick lateral ribs; beak 0.7–1 mm. Pappus with outer hairs ca. 0.2 mm. Fl. and fr. Sep.

● 4000–4100 m. Xizang.

We have not seen material of Cicerbita neglecta; therefore, its description is taken from the original publication.


毛鳞菊属 mao lin ju shu

Chaetoseris C. Shih; Kovalevskiella Kamelin; Stenoseris C. Shih.

Herbs, perennial, sometimes rosulate, rarely acaulescent, glabrous, glandular hairy, pilose, or hispid. Stems solitary or several, usually leafy. Leaves pinnate, lyrate-pinnate, or undivided. Capitula often nodding, with 3–40 florets. Involucre narrowly cylindric to broadly campanulate. Phyllaries glabrous or with soft or rigid hairs; outer phyllaries mostly in several series, gradually longer centripetally, mostly to more than 1/2 as long as inner ones and often even ± approaching them in length, more rarely very short, absent in one species with a secondary capitulum (Melanoseris souliei); inner phyllaries 3 to many, ± equal in length, ± linear-lanceolate to linear. Receptacle naked. Florets bluish, purplish, sometimes yellow, or rarely white. Achenes of brown, mostly strongly broadened lateral, 1 median ventrally, and (1 or)2 median dorsally) and with 0–2 slender ribs in between main ribs, apex truncate, attenuate, or with a stout beak. Pappus white or rarely yellowish, single of slender scabrid bristles or more frequently double and with an additional outer row of minute hairs.

Probably ca. 60–80 species: Africa, Asia, Himalayan region; 25 species (16 endemic) in China; one additional species (endemic) is tentatively placed with Melanoseris.

The generic name Melanoseris, based on M. lessertiana, is one of the oldest in subtribe Lactucinae but has never found recognition. Molecular phylogenetic analyses of subtribe Lactucinae (N. Kilian et al., in prep.) revealed, however, that the bulk of Chaetoseris, including the type of the name, the genus Stenoseris, and a number of species formerly placed in Cicerbita, Lactuca, Mulgedium, and Prenanthes, are all members of a sizable Melanoseris clade. The genus chiefly seems to represent the important branch in the evolution of subtribe Lactucinae that successfully colonized subtropical and drier tropical regions.

1a. Plants rosulate and acaulescent; capitula sessile, densely congested in a secondary capitulum; phyllaries only in 1 row ................................................................. 25. M. souliei
1b. Plants neither rosulate nor acaulescent; capitula without secondary capitula; phyllaries in 2 or more rows.

2a. Capitula with 3–9 florets; inner phyllaries 3–5(or 6).
3a. Involucre 1.5–1.8 mm; capitula with 7–9 florets; plants, including involucre, strongly hirsute with pale hairs ................................................................. 7. M. hirsuta
3b. Involucre 0.9–1.4(–1.6) mm; capitula with 3–6 florets; plants, including involucre, glabrous or ± hairy, but never strongly hirsute with pale hairs.
4a. Involucre 1.3–1.6 mm; inner phyllaries 4; achene 9–11 mm including a slender 3–4 mm beak .............. 10. M. henryi
4b. Involucre 0.9–1.4(–1.5) mm; inner phyllaries 3–5(or 6); achene 4–7 mm and unbeaked or with less than 2 mm beak.
5a. Outer phyllaries with longest 4–5 mm; inner phyllaries 5(or 6); florets 4–6 .................................................. 23. M. violifolia
5b. Outer phyllaries with longest ≤ 3 mm; inner phyllaries 3–5; florets 3–5.
6a. Leaf blade of all leaves not divided.
7a. Involucre with 3 or 4 inner phyllaries; capitula with 3 or 4 bluish purple florets; anther tube ca. 2 mm ................................................................. 16. M. temnis
7b. Involucre with 4 or 5 inner phyllaries; phyllaries with reddish hairs; capitula with 4 or 5 yellow florets; anther tube ca. 4 mm ................................. 26. Lactuca scandens
6b. Leaf blade of at least lower and middle leaves pinnatisect or lyrate-pinnatisect.
8a. Involucre 1.2–1.5 cm at anthesis and in fruit; outer phyllaries with longest to 3 mm; achene 6–7 mm .............................................................................. 18. M. graciliflora
8b. Involucre 0.9–1.1 cm at anthesis and in fruit; outer phyllaries with longest to 2 mm; achene 4–5 mm.
9a. Achenes unbeaked ........................................................................................................ 20. M. oligolepis
9b. Achenes contracted into a distinct stout beak of 0.5–1 mm.
10a. Rachis of leaves usually pectinate; leaf blade terminal lobe ovate to ovate-
lanceolate, base truncate, shallowly cordate, or broadly cuneate .......... 17. *M. triflora*
10b. Rachis of leaves not pectinate; leaf blade terminal lobe elliptic to lanceolate,
base cuneate ........................................................................................................... 19. *M. leptantha*

2b. Capitula with 10 or more florets; inner phyllaries at least (7 or)8.
11a. Peduncle bracts regularly conspicuous, usually purplish red when dry, lanceolate, to 1.5 cm, ±
semiamplexicaul ........................................................................................................ 24. *M. bracteata*
11b. Peduncle without or with inconspicuous bracts.

12a. Outer phyllaries with white densely fimbriate margin.
13a. Capitula with ca. 40 florets; involucre conspicuously thick and large,
1.8–2.3 × 1–1.5 cm ................................................................................................. 3. *M. macrantha*
13b. Capitula with ca. 15 florets; involucre only ca. 1.5 × 0.8 cm ............................. 4. *M. ciliata*

12b. Outer phyllaries with glabrous margin.
14a. Florets yellow (cyanic florets sometimes drying yellowish, corolla teeth then keeping
original color).
15a. Leaves pinnately lobed, lobes narrowly elliptic, elliptic, or lanceolate; involucre
1.1–1.5 mm ........................................................................................................ 1. *M. yunnanensis*
15b. Leaves pinnately lobed, lobes rhombic to irregularly rhombic; involucre
9–10 mm .................................................................................................................. 2. *M. rhombiformis*
14b. Florets purple, purplish red, blue, or exceptionally white.
16a. Plants 5–50 cm tall; stems either several, weak, and sparsely branched or with
solitary dominant stem branched from base or else stem delicate.
17a. Plants 5–30 cm tall; capitula with usually 12–24 florets; involucre to 10 mm
in diam. in fruit; branches, peduncles, and involucres often reddish villous;
pappus without a row of minute outer hairs ...................................................... 21. *M. lessertiana*
17b. Plants 20–50 cm tall; capitula with usually 10–15 florets; involucre ≤ 5 mm
in diam. in fruit; branches, peduncles, and involucres never reddish villous;
pappus with a row of minute outer hairs .......................................................... 22. *M. macrorhiza*
16b. Plants taller; stem strong, with dominant main stem apically branched.
18a. Lower and middle stem leaves gradually attenuate into a petiole or
petiole-like basal portion, at least middle stem leaves with blade
usually clasping stem; blade shape not as below.
19a. Involucre at fruiting 1–1.5 cm wide; capitula with usually
25–35 florets ......................................................................................................... 12. *M. atropurpurea*
19b. Involucre at fruiting less than 1 cm wide; capitula with usually
10–16 florets.
20a. Capitula with ca. 10 florets ................................................................. 14. *M. likiangensis*
20b. Capitula with 12–16 florets.
21a. Involucre 1.7–2 cm; leaf blade lateral lobes 1 or 2 pairs .... 13. *M. leiolepis*
21b. Involucre ca. 1.5 cm; leaf blade lateral lobes 5–7 pairs .... 15. *M. pectiniformis*
18b. Lower and middle stem leaves abruptly contracted from a basally broad
blade into a narrowly winged petiole; leaf blade undivided and
triangular-ovate to broadly lanceolate or pinnately lobed with 1–3 pairs
of elliptic to lanceolate lateral lobes.
22a. Lower and middle stem leaves with 2 or 3 pairs of lateral lobes;
leaf blade terminal lobe usually much narrower than blade.
23a. Involucre ca. 1.5 cm in fruit; capitula with usually 15–20
florets ........................................................................................................ 8. *M. sichuanensis*
23b. Involucre ca. 2 cm in fruit; capitula with ca. 30 florets .......................... 9. *M. taliensis*
22b. Lower and middle stem leaves undivided or with 1 or 2 pairs of lateral
lobes; leaf blade terminal lobe at least in some leaves as wide or almost
as wide as blade.
24a. Involucre 1.7–2.1 cm; capitula with ca. 40 florets ............................ 11. *M. macrocephala*
24b. Involucre 1.2–1.7 cm; capitula with usually 15–30 florets.
25a. Lower and middle stem leaves undivided or single leaves
with 1 pair of elliptic lateral lobes; involucre 1.3–1.7 cm ........................ 5. *M. cyanea*
25b. Lower and middle stem leaves with 1 or 2 pairs of elliptic
lateral lobes; involucre 1.2–1.5 cm ................................................................. 6. *M. beesiana*

云南毛鳞菊 yun nan mao lin ju


Herbs ca. 1 m tall or more, perennial. Stem slenderly tur- niplike. Stem solitary, erect, apically branched and glandular hairy. Lower and middle stem leaves with petiole 3–10 cm, narrowly winged, not clasping; leaf blade elliptic to ovate, 10–15 × 4–9 cm, pinnatifid or pinnatisect to bipinnately lobed, pilose and hispid glandular hairy, margin dentate; lateral lobes 2–6 pairs, opposite or alternate, elliptic to lanceolate, apex acute; secondary lobes if present 1 or 2 pairs, broadly triangular to lanceolate; terminal lobe elliptic to lanceolate. Upper stem leaves similar to middle stem leaves but petiole shorter; leaf blade smaller and less divided; uppermost leaves linear-lanceolate, undivided. Synflorescence racemiform to narrowly panicle-form, with few to many capitula. Capitula nodding, with usually 15–20 florets; peduncle wiry, 0.2–2 (–5) cm. Involucre purplish green, cylindric, 1.1–1.5 × 0.4–0.8 cm. Phyllaries ± acute at apex; outer phyllaries triangular-ovate to linear-lanceolate, glabrous or abaxially hispid on midvein, longest inner phyllaries in length. Florets yellow to whitish. Achene ca. 7 mm; body dark reddish brown, ellipsoid, compressed, lateral ribs broadened, apex contracted into a ca. 2 mm paler beak. Pappus double, outer hairs 0.1–0.2 mm, bristles 7–8 mm. Fl. and fr. Sep–Oct.

- Grasslands on mountain slopes, river valleys, forests; 700–3400 m. Sichuan, Yunnan.

Melanoseris yunnanensis and Chaetoseris lutea show many transitions between each other and actually seem to be conspecific. According to the fragmentary type material of Cicerbita cyanea var. teniana preserved at G (the type material in herb. Bonati, formerly at LA, is presumably lost), it represents a strongly glandular form of M. yunnanensis.


菱裂毛鳞菊 ling lie mao lin ju


Herbs 60–70 cm tall, perennial. Stem solitary, erect, apically with slender glabrous branches. Lower stem leaves with petiole 3–5 cm, basally widened; leaf blade narrowly elliptic, 14–17 × 5–8 cm, pinnatifidpartite, margin dentate; lateral lobes 6–9 pairs, ± rhombic to rarely triangularly haste, base broadly petiolate or sessile, apex acuminate; terminal lobe rhombic, haste, or triangular hastate-rhombic, apex acute. Middle stem leaves similar to lower stem leaves but with fewer lateral lobes. Upper stem leaves similar to middle stem leaves but broadly triangular to broadly ovate, base broadly winged, petiole-like, and auriculately clasping, margin entire; lateral lobes 2 pairs, irregularly triangular-hastate, basally attenuate; terminal lobe irregularly triangular-hastate. Synflorescence panicle-form, with numerous capitula. Capitula nodding, with ca. 10 florets. Involucre cylindric, 8–10 × ca. 3 mm. Phyllaries abaxially glabrous, apex acute to obtuse; outer phyllaries narrowly triangular to linear-lanceolate. Florets yellow. Achene 4–5 mm; body dark brown, ellipsoid, compressed, lateral ribs broadened, apex contracted into a ca. 1 mm beak. Pappus double, outer hairs inconspicuous, bristles ca. 4 mm. Fl. and fr. Sep–Oct.

- Thickets; ca. 2500 m. Yunnan (Eryuan).


缘毛毛鳞菊 yuan mao mao lin ju

Basionym: Lactuca macrantha C. B. Clarke, Compos. Ind. 267. 1876; Chaetoseris macrantha (C. B. Clarke) C. Shih; Cicerbita macrantha (C. B. Clarke) Beauverd.

Herbs 0.5–1.5 m tall, perennial. Stem stout, erect, apically branched and glandular hairy. Lower and middle stem leaves with petiole long (lowest leaves) to sessile with an expanded and clasping base; leaf blade narrowly spatulate, elliptic, or narrowly lanceolate, 14–40 (or more) × 4–8 cm, pinnatifidpartite to pinnatisect (in lowestmost leaves); lateral lobes 2–5 pairs but to 8-paired in lowestmost leaves, abaxially glabrous, margin coarsely dentate, apex acute; terminal lobe narrowly triangular, narrowly ovate, or irregular rhombic, apex acute to acuminate. Upper stem leaves similar to middle stem leaves but smaller and less divided. Synflorescence racemiform to corymbosely panicle-form, lax, with few capitula. Capitula with ca. 40 florets; peduncle (2–)5–14 cm. Involucre dark purplish green, broadly campanulate, 1.8–2.3 × 1–1.5 cm. Phyllaries with apex acute to obtuse; outer phyllaries ovate to lanceolate, margin white densely fimbriate; inner phyllaries without a fimbriate margin. Florets blue to bluish purple. Achene 6–7 mm; body brown, ellipsoid, compressed, lateral ribs broadened, apex tapering into a barely differentiated thick beak of 1–2 mm. Pappus double, outer hairs 0.1–0.2 mm, bristles ca. 8 mm. Fl. and fr. Jul–Sep. 2n = 16.

- Forests, thickets; ca. 2500–4100 m. Xizang [Bhutan, N India, Nepal].

4. Melanoseris ciliata (C. Shih) N. Kilian, comb. nov.

景东毛鳞菊 jing dong mao lin ju


Herbs ca. 50 cm tall. Stem erect, apically branched and sparsely glandular hairy. Lower and middle stem leaves with petiole 3–5.5 cm, narrowly winged, basally widened and auriculately clasping; leaf blade lyrate pinnatisect, abaxially or both surfaces with squarrose hairs on veins; lateral lobes 1 pair, elliptic, apex acute to obtuse; terminal lobe triangular, 6–8 × 3–4 cm, base truncate, apex acute. Upper stem leaves similar to middle stem leaves but smaller; uppermost stem leaves sessile, lanceolate to linear-lanceolate, undivided. Synflorescence racemiform, with few capitula. Capitula with ca. 15 florets. Involucre broadly cylindric to campanulate, ca. 1.5 × 0.8 cm. Phyllaries dark green, abaxially glabrous, apex acute to obtuse;

CICHORIEAE
Herbs 0.8–1.8 m tall, perennial. Root slenderly turniplike. Stem solitary, erect, branched apically, ± glabrous to densely covered with pubpil to brownish glandular hairs. Lower and middle stem leaves with petiole to 12 cm, narrowly winged, not or rarely very faintly sagittately clasping; leaf blade ovate to triangular, 5–11 × 3.5–8.5 cm, undivided or with 1 pair of ± elliptic terminal lobes, margin coarsely dentate, base of blade or terminal lobe cuneate, truncate, cordate, or hastate, apex acute. Upper stem leaves shortly petiolate to sessile; leaf blade similar to middle stem leaves but smaller, ± without petiole-like basal portion, otherwise similar to middle stem leaves. Synflorescence narrowly paniculiform, with few to some capitula. Capitula with usually 15–25 florets; peduncle 0.5–3 cm. Involucre cylindric to narrowly campanulate, 1.2–1.5 × 0.4–0.7 cm. Phyllaries dark green, abaxially densely glandular hispid, apex acute to obtuse; outer phyllaries narrowly triangular to lanceolate. Florets purple. Achene ca. 5 mm; body dark brown, broadly ellipsoid, compressed, lateral ribs broadened, apex attenuate into a pale 1–2 mm beak. Pappus double, outer hairs ca. 0.1 mm, bristles ca. 7 mm. Fl. and fr. Aug.–Oct. 2n = 16*.

- Forests, wastelands, farmlands; 700–3700 m. Sichuan, Xizang, Yunnan.

Melanoseris beesiana was established by C. Shih (Acta Phytotax. Sin. 29: 405. 1991) as Chaetoseris lyriformis (providing the type of the generic name Chaetoseris), but Lactuca beesiana provides an older epithet. It is, no doubt, closely related to the more widespread M. cyanae and mainly distinguished from the latter by its regularly lyratsect lower and middle stem leaves and somewhat smaller involucres. With some reservation, species rank is maintained for this taxon, but future research may reveal that subspecies rank is perhaps more appropriate.

7. Melanoseris hirsuta (C. Shih) N. Kilian, comb. nov.

Basionym: Chaetoseris hirsuta C. Shih in Y. Ling & C. Shih, Fl. Reipubl. Popularis Sin. 80(1): 282. 1997, based on Lactuca hirsuta (L.) C. Shih, Fl. Reipubl. Popularis Sin. 29: 141. 1991 (providing the type of the generic name Chaetoseris), but Chaetoseris hirsuta (providing the type of the generic name Chaetoseris), but Lactuca hirsuta provides an older epithet. It is, no doubt, closely related to the more widespread M. cyanae and mainly distinguished from the latter by its regularly lyratsect lower and middle stem leaves and somewhat smaller involucres. With some reservation, species rank is maintained for this taxon, but future research may reveal that subspecies rank is perhaps more appropriate.

Herbs 15–30 cm tall, perennial, with a taproot?and shootbearing lateral roots, strongly hirsute of pale partly glandular hairs. Stem solitary, erect, leafy. Lower and middle stem leaves oblaneate to ovoid in outline, ca. 12 × 5 cm, lyrately pinna, sepal, with a distinctly contracted to ± winged petiole-like portion, base semiauxplexicaul to weakly clasping, margin densely and sharply sinuate-dentate and denticulate; lateral lobes 1 or 2 pairs, triangular or rhombic, apex acute to obtuse; terminal lobe broadly ovate to broadly triangular, very much larger than lateral lobes, base cordate, apex acute. Upper stem leaves ovate to lanceolate, smaller, ± without petiole-like basal portion, otherwise similar to middle stem leaves. Synflorescence narrowly paniculiform, leafy, with few to some capitula. Capitula nodding, with ca. 8 florets; peduncle less than 1 cm. Involucre cylindric, 1.5–1.8 cm. Phyllaries abaxially hirsute as remainder of plant; outer phyllaries few, ± inconspicuous; inner phyllaries 5. Florets yellowish. Achene brown, narrowly ellipsoid, ca. 1 cm, subcompressed, apex attenuate into a short stout beak. Pappus single, yellowish, ca. 7 mm, caducous. Fl. and fr. Aug.–Oct.
8. Melanoseris sichuanensis (C. Shih) N. Kilian, **comb. nov.**


Herbs ca. 80 cm tall, perennial. Stem solitary, erect, apically branched and sparsely glandular hairy. Middle stem leaves with petiole 2.5–4 cm, very narrowly winged; leaf blade ovate to elliptic, 9–11 × 6–7 cm, pinnatisect to subpinnatisect, base ± truncate, margin dentate; lateral lobes 2 or 3 pairs, lanceolate, apex acute, acuminate, or obtuse; upper and middle lobes 2–4.5 × 1–1.5 cm; lower lobes smaller; terminal lobe elliptic-lanceolate, ca. 4 × 1.5 cm. Upper stem leaves similar to middle stem leaves but smaller; uppermost leaves linear. Synflorescence narrowly paniculiform, with numerous capitula. Capitula with usually 15–20 florets. Involucre cylindric to campanulate, ca. 1.5 × 0.5 cm. Phyllaries with an obtuse to acute apex; outer phyllaries lanceolate, hispid. Florets purplish. Achene ca. 6 mm; body pale brown, ellipsoid, compressed, lateral ribs broadened, apex contracted into a ca. 2 mm beak. Pappus double, outer hairs inconspicuous, bristles ca. 8 mm. Fl. and fr. Aug–Oct.

- Mountaintops; 2700–3700 m. Sichuan (Mianning), Yunnan.

9. Melanoseris taliensis (C. Shih) N. Kilian & Z. H. Wang, **comb. nov.**


Herbs ca. 50 cm tall, perennial. Rhizomes tuberlike. Stem solitary, erect, apically branched and glandular hairy. Lower and middle stem leaves with petiole 4–5 cm, winged, basally broadened and clasping; leaf blade narrowly ovate, 10–15 × ca. 6 cm, runcinately pinnatifid to subpinnatisect, margin dentate, apex acute to obtuse; lateral lobes 2 or 3 pairs, elliptic to irregularly rhombic, increasing in size toward leaf apex; terminal lobe lanceolate, irregularly rhombic, or falcate, much narrower than lateral lobes, with few small semiorbicular lobes. Upper stem leaves similar to lower and middle stem leaves but smaller; uppermost leaves linear-lanceolate, undivided. Synflorescence racemiform to sparsely paniculiform, with few capitula. Capitula with ca. 30 florets. Involucre campanulate, ca. 2 × 1 cm. Phyllaries glabrous, apex obtuse to obtuse; outer phyllaries triangular-lanceolate. Achene 8–9 mm; body dull brown, narrowly elliptoid, compressed, lateral ribs broadened, apex tapering into a paler 2–3 mm beak. Pappus double, outer hairs ca. 0.1 mm, bristles ca. 7 mm. Fl. and fr. Oct. $n = 16^*$.  

- Mountaintops; 2800–3000 m. Yunnan (Dali, Lijiang).

10. Melanoseris henryi (Dunn) N. Kilian, **comb. nov.**


Herbs to 1 m tall, perennial. Stem solitary, erect, apically branched, glabrous, leafy. Lower stem leaves not seen. Middle stem leaves spatulate, to 12 × 3 cm, pinnatifid to pinnatifide, somewhat setose, base attenuate, margin sinuate-dentate, apex obtuse to acute; lateral lobes 1 or 2 pairs, semiorbicular to broadly ovate; terminal lobe ovate to lanceolate, as wide as lateral lobes. Upper stem leaves similar to middle stem leaves but smaller and less divided, apex acute to acuminate; uppermost stem leaves narrowly elliptic, undivided. Synflorescence paniculiform with some to many capitula. Capitula with 4 or 5? florets; peduncle wiry, sparsely setose. Involucrre narrowly cylindric, 1.3–1.6 × ca. 0.3 cm. Phyllaries glabrous, apex obtuse; outer phyllaries lanceolate to linear-lanceolate, longest ca. 1/2 as long as inner ones; inner phyllaries 4. Florets ?purplish. Achene 0.9–1.1 cm; body reddish, narrowly ellipsoid, compressed, apex tapering into a paler 3–4 mm beak. Pappus ca. ?7 mm.

- About 1500 m. Yunnan (Pu’er).

*Lactuca henryi*, based on the collection *A. Henry* 13494, was omitted from FRPS and by X. Zhang (Fl. Yunnan. 13. 2004), but, as confirmed by the electronic image of an isotype at NY, it represents a species well characterized by its slender involucres and long-beaked achene. It can fairly safely be assigned to *Melanoseris*.

11. Melanoseris macrocephala (C. Shih) N. Kilian & J. W. Zhang, **comb. nov.**


Herbs 50–100 cm tall, perennial. Stem solitary, erect, apically branched and glandular hairy. Lower and middle stem leaves with petiole 5–10 cm, narrowly winged; leaf blade ovate to ± broadly lanceolate, 10–14 × 5–6 cm, undivided or pinnatisect, abaxially sparsely glandular hairy, base ± truncate, margin dentate, apex acute to acuminate; lateral lobes (0 or) 1 or 2 pairs, elliptic, apex obtuse to acute; terminal lobe ovate to broadly lanceolate, often hastate and comprising most of blade, apex acute to acuminate. Upper stem leaves with shorter petiole and otherwise similar to middle stem leaves; uppermost stem leaves sessile, lanceolate, base cuneate, apex acuminate. Synflorescence racemiform or paniculiform, with few to several capitula. Capitula with ca. 40 florets; peduncle 1–5 cm. Involucrre broadly campanulate, 1.7–2.1 × ca. 1 cm. Phyllaries glandular hispid, apex acute; outer phyllaries triangular to lanceolate. Florets purplish red. Achene ca. 5 mm; body dark brown, ellipsoid, compressed, lateral ribs broadened, apex attenuate into a pale 1–2 mm beak. Pappus double, outer hairs 0.1–0.2 mm, bristles ca. 7 mm. Fl. and fr. Aug.–Sep.

- Forest margins, thickets, grasslands; 2000–3500 m. Xizang (Nyalam).

12. Melanoseris atropurpurea (Franchet) N. Kilian & Z. H. Wang, **comb. nov.**

Basionym: *Lactuca atropurpurea* Franchet, J. Bot. (Morot) 9: 260. Jul 1895; *Chaetoseris dolichophylla* C. Shih; *C. grandi-
are the combinations in hairs 0.2–0.3 mm, bristles ca. 8 mm. Fl. and fr. Jul–Nov. Tapering into a pale 1–2 mm thick beak. Pappus double, outer dark brown, ellipsoid, compressed, lateral ribs broadened, apex obtuse to acute; terminal lobe triangular, ± irregularly rhombic, elliptic, or lanceolate, much larger than lateral lobes, base hastate to rounded, apex acute to obtuse. Lower and middle stem leaves shortly petiolate to sessile and clasping, similar to basal leaves but smaller; lateral lobes 3–7 pairs. Upper stem leaves sessile, less divided and smaller. Synflorescence racemiform or panicleiform, with few to several capitula. Capitula nodding before anthesis, with usually 25–35 florets; peduncle 1–2–(6–10) cm. Involucr e dark purplish green, broadly campanulate, 1.7–2.1 × 1–1.5 cm. Phyllaries glabrous, or rarely glandular hispid; outer phyllaries triangular-ovate to lanceolate. Flores blue to bluish purple. Achenes 6–7 mm; body brown to dark brown, ellipsoid, compressed, lateral ribs broadened, apex tapering into a paler 1–2 mm beak. Pappus double, outer hairs 0.1–0.2 mm, bristles ca. 8 mm. Fl. and fr. Oct.

- Mountain slopes; ca. 2500 m. Yunnan (Jingdong).


丽江毛鳞菊 li jiang mao lin ju

Basionym: *Lactuca likiangensis* Franchet, J. Bot. (Morot) 9: 259. 1895; *Chaetoseris bonatii* (Beauverd) C. Shih; *C. likiangensis* (Franchet) C. Shih; *Cicerbita bonatii* Beauverd; *C. likiangensis* (Franchet) Beauverd; *L. bonatii* (Beauverd) H. Léveillé; *L. forrestii* W. W. Smith.

- Forests, open boulder-strewn slopes, grasslands; 1900–3100 m. Yunnan.

According to the type material preserved at G, *Chaetoseris bonatii*, based on *Cicerbita bonatii*, is apparently conspecific.


栉齿毛鳞菊 zhi chi mao lin ju


- Forests, forest margins, thickets, alpine meadows; 2800–4000 m. Sichuan, Xizang, Yunnan [Myanmar].

- Mountain slopes; ca. 1300 m. Yunnan (Jingdong).
ula. Capitula with ca. 15 florets. Involucre cylindric, ca. 1.5 × 0.6 cm. Phyllaries glandular hispid, apex acute to obtuse; outer phyllaries lanceolate to linear-lanceolate. Florets purplish red. Achene ca. 6 mm; body dark brown, ellipsoid, compressed, lateral ribs broadened, apex attenuate into a 2–3 mm beak. Pappus double, outer hairs 0.1–0.2 mm, bristles ca. 7 mm. Fl. and fr. Aug.

- Forests in mountain valleys; ca. 3200 m. Xizang (Mainling).

### 16. Melanoseris tenuis (C. Shih) N. Kilian, comb. nov.

**全叶细莴苣**


Herbs 0.5–1.5 m tall, perennial. Stem solitary, erect, apically branched and glandular hairy. Lower and middle stem leaves with petiole 5–8 cm, basally slightly widened and not claspering; leaf blade triangular to triangular-ovate, 5–14 × 5–10 cm, undivided, glandular hairy, glabrescent, base somewhat cuneate to truncate, shallowly cordate, or shallowly hastate, margin mucronulate-dentate, apex acute to acuminate. Upper stem leaves similar to middle stem leaves but with shorter petiole and smaller; uppermost stem leaves sessile or subsessile. Synflorescence paniculiform, with usually numerous capitula and capilaceous branches. Capitula with 3 or 4 florets; peduncle capillaceous. Involucre with ca. 3 or 4 florets; peduncle capilaceous. Involucre narrowly cylindric, 12–15 × ca. 1.5 mm. Phyllaries glabrous; outer phyllaries triangular-ovate to lanceolate, 5.5–11 × 4–9 cm, base truncate, completely separated from terminal lobe, opposite or alternate, sessile or shortly petiolulate, elliptic to lanceolate, 1.5–4.5 × 1–2 cm, base cuneate to truncate, apex acute to acuminate; terminal lobe triangular-ovate to lanceolate, 5.5–11 × 4–9 cm, base hastate, cordate, truncate, or cuneate, apex acute. Upper stem leaves shortly petiolate to subsessile, smaller, less or not divided, otherwise similar to middle stem leaves. Synflorescence paniculiform, with numerous capitula and capilaceous branches. Capitula with usually 3 or 4 florets; peduncle capilaceous. Involucre narrowly cylindric, 12–15 × ca. 1.5 mm. Phyllaries glabrous; outer phyllaries triangular-ovate to lanceolate, largest ca. 3 × 1 mm, apex acute; inner phyllaries 3. Florets bluish purple. Achene ca. 5 mm; body brown, narrowly ellipsoid to obcolumnar, compressed, lateral ribs broadened, apex contracted into a thick ca. 1 mm beak. Pappus ± single, ca. 6 mm. Fl. and fr. Aug–Sep.

- Forest margins, forests, thickets; 2400–3100 m. S and SE Xizang (Bomi, Nyalam, Yadong), NW Yunnan.

### 17. Melanoseris triflora (C. Chang & C. Shih) N. Kilian, comb. nov.

**栉齿细莴苣**


Herbs to 1.2 m tall, perennial. Stem stout, apically branched and glabrous or sparsely glandular hairy. Lower and middle stem leaves with petiole 9–11 cm, pectinate, basally slightly widened; leaf blade lyrate-pinnatisect with pectinate rachis, glandular hairy, glabrescent; lateral lobes 1 or 2 pairs, elliptic, ovate, or lanceolate, much smaller than terminal lobe, base rounded, margin coarsely mucronulate-dentate, apex acute to shortly acuminate; terminal lobe ovate to ovate-lanceolate, 9–11 × 7–9 cm, base truncate, shallowly cordate, or broadly cuneate, apex acuminate to acute. Upper stem leaves smaller, with shorter pectinate petiole, and 1 pair of lateral lobes, otherwise similar to middle stem leaves; uppermost leaves lanceolate, ± undivided, apex acuminate. Synflorescence paniculiform, with numerous capitula and capilaceous branches. Capitula with 3 florets; peduncle capilaceous. Involucre narrowly cylindric, 9–11 × 1–1.5 mm. Phyllaries glabrous; outer phyllaries ovate, longest ca. 1.5 × 0.5–1 mm, apex obtuse to acute; inner phyllaries 3. Florets purplish red. Achene ca. 4 mm; body pale brown, ellipsoid, compressed, lateral ribs broadened, apex constricted into a thick 0.5–1 mm beak. Pappus ± single, ca. 6 mm. Fl. and fr. Oct.

- Forest margins, forests; 2000–2800 m. Yunnan (Fugong, Lüchun).

### 18. Melanoseris graciliflora (Candolle) N. Kilian, comb. nov.

**细莴苣**

Basionym: *Lactuca graciliflora* Candolle, Prodr. 7: 139. 1838; *Cicerbita taliensis* (Franchet) Beauverd; *L. taliensis* Franchet; *Stenoseris graciliflora* (Candolle) C. Shih; *S. taliensis* (Franchet) C. Shih.

Herbs 0.5–2.5 m tall, perennial. Root slenderly turniplike. Stem solitary, erect, apically branched and glabrous or sparsely glandular hairy. Lower and middle stem leaves with petiole 4–7 cm, basally slightly widened; leaf blade pinnatisect to lyrate-pinnatisect, glandular hairy, margin shallowly mucronulate-dentate; lateral lobes 2 or 3 pairs but uppermost pair often incompletely separated from terminal lobe, opposite or alternate, sessile or shortly petiolate, elliptic to lanceolate, 1.5–4.5 × 1–2 cm, base cuneate to truncate, apex acute to acuminate; terminal lobe triangular-ovate to lanceolate, 5.5–11 × 4–9 cm, base hastate, cordate, truncate, or cuneate, apex acute. Upper stem leaves shortly petiolate to subsessile, smaller, less or not divided, otherwise similar to middle stem leaves. Synflorescence paniculiform, with numerous capitula and capilaceous branches. Capitula with usually 3 or 4 florets; peduncle capilaceous. Involucre narrowly cylindric, 12–15 × ca. 1.5 mm. Phyllaries glabrous; outer phyllaries triangular-ovate to lanceolate, largest ca. 3 × 1 mm, apex acute; inner phyllaries 3. Florets bluish purple. Achene 6–7 mm; body brown, narrowly ellipsoid to oblong-columnar, compressed, lateral ribs broadened, apex contracted into a thick 1–1.5 mm beak. Pappus ± single, 6–7 mm. Fl. and fr. Jun–Sep. 2n = 16*. 

- Thickets, forest margins, grasslands; 2800–3500 m. Guizhou, Sichuan, Xizang, Yunnan [Bhutan, India, Myanmar, Nepal].

### 19. Melanoseris leptantha (C. Shih) N. Kilian, comb. nov.

**景东细莴苣**


Herbs 50–70 cm tall, perennial. Stem solitary, erect, apically branched and sparsely glandular hairy. Lower and middle stem leaves with petiole 1–4 cm, basally slightly widened; leaf blade lyrate-pinnatisect, glabrous, margin mucronulate-dentate; lateral lobes 1 pair, elliptic, ca. 2 × 1 cm, apex obtuse to rounded; terminal lobe elliptic to lanceolate, 5.5–10 × 3–4 cm, apex acuminate. Upper stem leaves petiolate or sessile, lanceolate to elliptic, 7–9 × ca. 1.5 cm, undivided, base cuneate, otherwise similar to middle stem leaves. Synflorescence paniculiform, with numerous capitula and capilaceous branches. Capitula with ca. 3 florets; peduncle capilaceous. Involucre narrowly cylindric, 10 × 2 mm. Phyllaries purplish red, glabrous; outer phyllaries ovate, largest ca. 1 × 0.5 mm, apex obtuse; inner phyllaries 3. Florets bluish purple. Achene ca. 4 mm; body yellowish brown, narrowly ellipsoid to obcolumnar,
compressed, lateral ribs broadened, apex contracted into a thick ca. 1 mm beak. Pappus ± single, ca. 5 mm. Fl. and fr. Nov. 2n = 16*.

- Moist areas on mountain slopes; 2500–3200 m. Sichuan (Muli), Yunnan (Jingdong).

Melanosieris leptantha appears rather similar to Stenosieris triflora, and its specific distinctness needs confirmation.


Herbs 0.6–1.3 m tall, perennial. Stem solitary, erect, apically branched and ± brownish pilose, leafy. Lower and middle stem leaves with petiole to 6 cm, unwinged; leaf blade obovate to oblancoate, pinnatisect, margin faintly sinuate-dentate; lateral lobes 1 or 2 pairs, narrowly elliptic, 2.5–4 × 1–1.5 cm, apex acute to acuminate; terminal lobe ovate to lanceolate, 4–10 × 2–4 cm, apex acute to acuminate. Synflorescence narrowly paniculiform, with numerous capitula and capilaceous branches. Capitula with 4 florets; peduncle capilaceous. Involucre cylindric, 9–11 × ca. 2 mm. Phyllaries glabrous; outer phyllaries triangular-ovate to lanceolate, longest ca. 2 mm; inner phyllaries 4. Florets blue. Achene brown, narrowly ellipsoid, 4–5 mm, compressed, lateral ribs broadened, apex truncate. Pappus double, outer hairs to 0.1 mm, bristles ca. 7 mm. Fl. and fr. Aug.

- Forests on mountain slopes; 2101–3000 m. Yunnan (Dali).

Originally placed in Cicerbita, Melanosieris oligolepis is morphologically near and apparently closely related to the preceding four species.


Melanosieris lessertiana (Candolle) Decaisne, 1843.

Herbs 5–30[–40] cm tall, perennial. Root slenderly turnip-shaped, lateral ribs broadened, apex contracted into a thick ca. 1 mm beak. Pappus ± single, ca. 5 mm. Fl. and fr. Nov. 2n = 16*.

- Moist areas on mountain slopes; 2500–3200 m. Sichuan (Muli), Yunnan (Jingdong).

Melanosieris leptantha appears rather similar to Stenosieris triflora, and its specific distinctness needs confirmation.


Herbs 0.6–1.3 m tall, perennial. Stem solitary, erect, apically branched and ± brownish pilose, leafy. Lower and middle stem leaves with petiole to 6 cm, unwinged; leaf blade obovate to oblancoate, pinnatisect, margin faintly sinuate-dentate; lateral lobes 1 or 2 pairs, narrowly elliptic, 2.5–4 × 1–1.5 cm, apex acute to acuminate; terminal lobe ovate to lanceolate, 4–10 × 2–4 cm, apex acute to acuminate. Synflorescence narrowly paniculiform, with numerous capitula and capilaceous branches. Capitula with 4 florets; peduncle capilaceous. Involucre cylindric, 9–11 × ca. 2 mm. Phyllaries glabrous; outer phyllaries triangular-ovate to lanceolate, longest ca. 2 mm; inner phyllaries 4. Florets blue. Achene brown, narrowly ellipsoid, 4–5 mm, compressed, lateral ribs broadened, apex truncate. Pappus double, outer hairs to 0.1 mm, bristles ca. 7 mm. Fl. and fr. Aug.

- Forests on mountain slopes; 2101–3000 m. Yunnan (Dali).

Originally placed in Cicerbita, Melanosieris oligolepis is morphologically near and apparently closely related to the preceding four species.

glandulosus Boissier) is a congener of Cicerbita, Melanoseris macro-
rhiza, previously treated as a member of Cephalorhynchos (e.g., FRPS 80(1): 291. 1997), clearly belongs to Melanoseris. The white-flowered C. albiflorus is considered as a mere albino form of this species, as is known also occasionally in other species, and therefore treated as conspecific.

23. Melanoseris violifolia (Decaisne) N. Kilian, comb. nov.

Basionym: Prenanthes violifolia Decaisne in Jacquemont, Voy. Inde 4(Bot.): 100. 1843 ["violaefolia"]; Cicerbita sikkimensis (J. D. Hooker) C. Shih; C. violifolia (Decaisne) Beauverd; Lactuca hookeri (C. B. Clarke ex J. D. Hooker) Stebbins; L. sikkimensis (J. D. Hooker) Stebbins; P. alata J. D. Hooker & Thomson ex C. B. Clarke (1876), not (Hooker) D. Dietrich (1847); P. hookeri C. B. Clarke ex J. D. Hooker; P. sikkimensis J. D. Hooker.

Herbs 50–70 cm tall, perennial. Stem solitary, erect, branched apically, glabrous or sparsely striigate. Basal, lower, and middle stem leaves with petiole 5–6 cm, slender, ± broadly winged toward base; leaf blade undivided or lyrate-pinnatisect, margin sparsely sinuate-dentate to subentire; lateral lobes if present 1 pair, sessile or with a 7–8 mm winged petiolule, lanceolate to elliptic, to 2 × 1 cm; terminal lobe broadly triangular to triangular-ovate, 3–8 × 3–7 cm, base hastate, coriaceous, sagittate, or truncate, apex obtuse to rounded. Upper stem leaves similar to middle stem leaves or with much shorter winged basally narrowing to clasping petiole and smaller blade with a basally cuneate terminal lobe. Synflorescence paniculiform, with several to 30 capitula and slender branches. Capitula with 4–6 florets; peduncle capillaceous. Involute narrowly cylindric, 1.2–1.4 × ca. 0.3 cm. Phyllaries glabrous, apex acute to obtuse; outer phyllaries lanceolate, longest 4–5 mm; inner phyllaries 5(or 6). Florets bluish to reddish purple. Achene dark brown, narrowly elliptoid, 6–7 mm, subcompressed, lateral ribs weakly broadened, apex truncate. Pappus double, outer hairs ca. 0.1 mm, bristles 6–8 mm. Fl. and fr. Jun–Aug.

Seeds, forest margins, meadows; 3000–3700 m. Xizang [Bhutan, NE and NW India, Nepal].

Melanoseris violifolia, formerly treated as a member of Cicerbita (e.g., FRPS 80(1): 223. 1997, under C. sikkimensis) is, as inferred from morphology, closely related to M. macrorhiza and can therefore safely be considered as a member of Melanoseris too.

24. Melanoseris bracteata (J. D. Hooker & Thomson ex C. B. Clarke) N. Kilian, comb. nov.

苞叶毛鳞菊 bao ye mao lin ju

Basionym: Lactuca bracteata J. D. Hooker & Thomson ex C. B. Clarke, Compos. Ind. 270. 1876; Mulgedium bracteatum (J. D. Hooker & Thomson ex C. B. Clarke) C. Shih.

Herbs, perennial. Root slender. Stem solitary, 20–120 cm, erect, branched apically, strongly glandular hairy to glandular hispid. Basal and lower stem leaves ovate, elliptic-ovate, or oblanceolate, 3–6 × 1–2.5 cm, glandular hairy, base attenuate and auriculately clasping, margin sinuate-dentate, apex acute. Middle and upper stem leaves smaller, oblanceolate to lanceolate, apex acuminate, otherwise similar to lower leaves. Leaves in synflorescence usually purplish red when dry, lanceolate, base ± semiamplexicaul, margin entire, apex acuminate. Synflorescence racemiform or sparsely paniculiform, leafy, with several to 20 capitula. Capitula nodding at anthesis, with usually 20–30 florets; peduncle with lanceolate bracts to 1.5 cm. Involute campanulate, 1.2–1.4 cm at anthesis, to 1.9 × 1 cm in fruit. Phyllaries purplish red when dry, abaxially glabrous, apex obtuse to acute; outer phyllaries lanceolate, not much shorter than inner phyllaries. Florets pale blue to mauve. Achene 5–9 mm; body grayish brown, fusiform, compressed, lateral ribs weakly broadened, apex attenuate into a slender beak 1/3–1/2 as long as achene body. Pappus indistinctly double, 7–8 mm. Fl. and fr. Sep. 2n = 16.

Forests; 800–3000 m. Xizang [Bhutan, NE and NW India, Nepal].

25. Melanoseris souliei (Franchet) N. Kilian, comb. nov.

康滇毛鳞菊 kang dian mao lin ju

Basionym: Lactuca souliei Franchet, J. Bot. (Morot) 9: 257. 1895; Syncalathium orbiculariforme C. Shih; S. souliei (Franchet) Y. Ling.

Herbs 2–5 cm tall, perennial, rosalate, ± aculeolate, with a taproot. Rosette shoot terminally hollow, inflated to secondary capitulum. Leaves with petiole 1–5 cm, basally widened; leaf blade of outer leaves undivided, broadly triangular, triangular-ovate, orbicular, or obovate, 0.5–2 × 0.5–1.5 cm; leaf blade of more inner leaves 1.5–7 × 1–2.5 cm, lyrate pinnatisect to pinnatisect, margin sinuate-dentate or entire; lateral lobes 1–3 pairs, elliptic, semiorbiculate, triangular, or suborbicular; terminal lobe elliptic, ovate, suborbicular, or triangular-ovate, 1–3 × 0.8–2.5 cm, base cordate to truncate, apex rounded to acute. Secondary capitulum (1–)2–7 cm in diam., with few to many sessile densely congested capitula with 1 elliptic subtending leaf. Capitula with 4–6 florets. Involute narrowly cylindric, 1–1.4 × 0.4–0.5 cm. Phyllaries 5, in 1 row, equal, lanceolate, connate for basal 1/3–1/2. Florets purplish red to blue. Achene ca. 4 mm; body dark to blackish brown, obovoid, compressed, with winglike lateral ribs and 1 slender rib on either side, apex corridor in a ca. 0.5 mm fragile thin beak. Pappus single, ca. 8 mm, caducous with pappus disk. Fl. and fr. Aug. 2n = 16*.

Alpine meadows, scree slopes, rocky areas, marshes, forest margins; 2300–4300 m. Sichuan, Yunnan [?Bhutan, Myanmar].

Recent works, corroborating the observation by Stebbins (Mem. Torrey Bot. Club 19(3): 47–50. 1940) on the peculiarity of Melanoseris souliei inferred from achene morphology, have shown that M. souliei is misplaced in Syncalathium and the Crepidinae (J. W. Zhang et al., Bot. J. Linn. Soc. 154: 79–87. 2007; N. Kilian et al. in V. A. Funk et al., Syst. Evol. Biogeogr. Compositae, 348–350. 2009; J. W. Zhang et al., Taxon 60: 15–26. 2011) and the striking overall similarity to the species of that genus purely a result of convergent evolution in response to the environmental changes following the uplift of the Qinghai-Xizang Plateau. The inclusion of Syncalathium orbiculariforme by X. Zhuang (Fl. Yunnan. 13: 764. 2004) has been supported also by molecular studies (J. W. Zhang et al., loc. cit. 2011). The molecular phylogenetic analysis of subtribe Lactucinae (N. Kilian et al., in prep.) reveals the species to be nested in the Melanoseris clade. It is here therefore tentatively assigned to Melanoseris, admitting that this is debatable in the light of its peculiar morphology and the still not settled circumscription of the genus.

Herbs, perennial. Stem semiscandent, pale purplish red, with reddish bristles. Basal leaves unknown. Lower and middle stem leaves with red bristles and with slender basally ± widened, ± winged petiole to ca. 9 cm; leaf blade suborbicular or subreniform, 4.5–5.5 × 4.5–7.5 cm, base cordate, margin faintly denticulate, apex acuminate. Uppermost stem leaves sessile or with short, winged, clasping petiole and ovate to narrowly elliptic-ovate blade, otherwise similar to middle stem leaves. Synflorescence racemiform, branches 1–1.5 cm with 2 or 3 capitula. Capitula with 4 or 5 florets. Involucre narrowly cylindric, ca. 1.2 cm. Phyllaries blackish green, reddish setose; outer phyllaries inconspicuous; inner phyllaries 4 or 5, apex subacute. Florets yellow. Achene not seen when mature. Pappus white, ca. 6.5 mm.

C. C. Chang (Baxian).

No material has been available of Lactuca scandens, based on and only known from the collection T. T. Yü 1702 made in October 1932 in the "vicinity of Pa-hsiien" (deposited in the herbarium of the Science Society of China at Nanking). C. C. Chang compared it with, and considered it to be related to, the insufficiently known L. hirsuta Franchet, placed here in Melanoseris not without doubt (see above). Lactuca scandens is diagnosed rather clearly, and in its combination of characters it resembles only few known species of Cichorieae in China (even if the presumed scandent habit is ignored) but matches none in a way that conspecificity could be proposed with sufficient confidence. A safe generic assignment, however, is not possible from the original description; thus, its treatment under Melanoseris is very tentative and a formal transfer not justified.


Shi Zhu (石铸 Shih Chu); Norbert Kilian

Herbs, perennial or more rarely annual. Stem usually solitary, erect, branched apically, glabrous or glandular hairy, leafy or rarely ± leafless. Leaves pinnately lobed or more rarely undivided. Synflorescence with capillary branches. Capitula often pendant at anthesis, with 4–15 florets; peduncle capillaceous. Involucre narrowly cylindric. Phyllaries usually green and tinged pale purplish red, glabrous; outer phyllaries few, gradually longer centripetally, mostly much shorter than inner phyllaries; inner phyllaries usually 5 or 8, ± equal in length, ± linear-lanceolate to linear. Receptacle naked. Florets pale reddish or purple. Achene body dark to blackish brown, fusiform, weakly compressed, with 5 main ribs (2 lateral, 1 median ventrally, and 2 median dorsally) and 2 rather similar secondary ribs in between, apically attenuate and pale but without or rarely with a short beak. Pappus white, single, of slender scabrid bristles.

Twelve species: E and SE Asia; 12 species (11 endemic) in China.

1a. Involucre with 5(or 6) inner phyllaries.

2a. Stem leafless or with a single or very few leaves; leaves mostly undivided or more rarely with 1 pair of very small ovate lateral lobes ................................................................. 6. P. umbrosa

2b. Stem leafy throughout; leaves with 1–7 pairs of lateral lobes or more rarely undivided.

3a. Lower and middle stem leaves pinnatisect to subpinnatisect, with 4–7 pairs of ± narrowly elliptic lateral lobes, rachis for most part not or narrowly winged ................................................................. 10. P. dolichophylla

3b. Lower and middle stem leaves lyrate pinnatifid to pinnatisect, with 1–4 pairs of elliptic to triangular lobes or more rarely undivided, rachis for most part at least broadly winged.

4a. Stem leaves with mostly a slender cuneately winged petiole and undivided blade or blade lyrate pinnatisect to lyrate pinnatifid with 1 or 2(or 3) pairs of lobes ....................................................... 8. P. diversifolia

4b. Stem leaves with an unwinged petiole and lyrate pinnatifid to lyrate pinnatisect blade with 3 or 4 pairs of lobes ................................................................. 9. P. heptantha

1b. Involucre with ca. 8 inner phyllaries.

5a. Middle and upper stem leaves auriculately to sagittately clasping stem.

6a. Leaves sagittately clasping stem; outer phyllaries longest 5–8 mm ........................................................................... 2. P. yunnanensis

6b. Leaves auriculately clasping stem; outer phyllaries longest 4–5 mm ........................................................................... 3. P. auriculiformis

5b. Stem leaves not clasping stem and except for uppermost ± petiolate.

7a. Stem leaves all palmately 3-lobed or palmately 3-cleft ................................................................. 11. P. multiflora

7b. Stem leaves undivided or pinnately lobed with 1–8 pairs of lateral lobes.

8a. Middle stem leaves sessile, 3-parted, with to 20 cm linear terminal lobe and 1 pair of very small broadly linear-lanceolate lateral lobes at its base ................................................................. 12. P. longiloba

8b. Middle stem leaves petiolate, undivided or pinnately divided with (1 or)2–5 pairs of lateral lobes.

9a. Middle stem leaves lyrate pinnate, pinnatifid, or pinnatisect with broader lateral or terminal lobes or rarely undivided.

10a. Leaves adaxially glaucous, margin shallowly and distantly denticulate; synflorescence corymbiform; achene ca. 5 mm, attenuate into a pale stout ca. 1 mm beak .................................. 1. P. polypodiifolia


1–3(or 4) pairs, opposite or alternate, rhombic-elliptic, lanceolate, or linear and sometimes falcate, to 8 cm, apex acute; terminal lobe narrowly elliptic, broadly lanceolate, or linear-lanceolate, to 13 cm, apex acute to acuminate. Upper stem leaves sessile, smaller, pinnatisect, lobes ± linear-lanceolate. Synflorescence paniculiform, with some to many capitula. Capitula with usually 12–15 florets. Involucre 9–11 × ca. 3 mm. Phyllaries with an obtuse to acute apex; outer phyllaries triangular-ovate to lanceolate, largest 5–7 × 1–2 mm; inner phyllaries 5(or 6). Florets purplish red. Achene ca. 6 mm, contracted into a ca. 1 mm beak. Pappus 6–7 mm. Fl. and fr. Oct.

● Forests; ca. 1200 m. Yunnan.


密毛假福王草  mi mao jia fu wang cao


Herbs 40–100 cm tall, annual. Stem apically densely glandular hairy. Basal leaves, lower stem leaves, and middle stem leaves with petiole 3–7 cm, unwinged, basally not or scarcely widened; leaf blade pinnatisect, ± glabrous, margin very shallowly mucronulate-dentate or entire; lateral lobes 2–8 pairs, opposite to obliquely opposite; basal leaf blade rhombic to elliptic, 5–20 × 4–10 mm; other lateral lobes linear-elliptic to linear-lanceolate, 2.5–6 × 0.5–2 cm, apex acute to acuminate; terminal lobe linear-elliptic to linear-lanceolate, 6–10 × 0.3–1.5 cm, apex acute to acuminate. Upper stem leaves shortly petiolate or sessile, similar to middle stem leaves or 3-parted; uppermost stem leaves linear-elliptic, undivided. Synflorescence paniculiform to corymbose so, with many capitula. Capitula with usually 10–15 florets. Involucre 9–11 × ca. 3 mm. Outer phyllaries triangular to lanceolate, largest ca. 3 × 0.3–0.5 mm, apex acute; inner phyllaries 8, apex ± obtuse. Florets bluish purple. Achene ca. 4 mm, attenuate into a ca. 1 mm beaklike apex. Pappus 5–6 mm. Fl. and fr. Apr–May.

● Forests, forest margins; 500–2300 m. Sichuan, Yunnan.


伞房假福王草  san fang jia fu wang cao

*Lactuca umbrosa* Dunn, J. Linn. Soc., Bot. 35: 513. 1903; *Mulgedium umbrosum* (Dunn) C. Shih.

Herbs 40–140 cm tall, annual. Stem glabrous, leafless, with a single leaf, or with very few leaves. Basal leaves with petiole 4–17 cm, unwinged; leaf blade mostly triangular to triangular-ovate, 6–13 × 5–10 cm, undivided, base cordate, hastate, or sagittate, margin entire or sinuate and remotely unequally mucronulate dentate; leaf blade more rarely pinnatisect with 1 pair of small ovate lateral lobes. Stem leaves if any triangular-hastate, undivided, otherwise like basal leaves. Synflorescence corymbose to corymbose panicle, with few to many capitula. Capitula with usually 6–10 florets. Involucres cylindric, 10–13 × 2–3 mm. Phyllaries glabrous, apex acute; outer phyllaries triangular-ovate to lanceolate, largest 5–7 × 1–2 mm; inner phyllaries 5(or 6). Florets purplish red. Achene ca. 6 mm, contracted into a ca. 1 mm beak. Pappus 6–7 mm. Fl. and fr. Oct.

● River valleys; ca. 1200 m. Yunnan.

*Paraprenanthes umbrosa* has previously been placed in *Mulgedium* (e.g., FRPS 80(1): 72. 1997). Its reclassification by Sennikov is convincing and is followed here.


假福王草  jia fu wang cao

*Lactuca sororia* Miquel, Ann. Mus. Bot. Lugduno-Batavi 2: 189. 1866; *L. sororia* var. glabra Y. Ling; *L. sororia* var. glabra Kitamura; *L. sororia* var. glandulosa Kitamura; *L. sororia* var. nudipes (Migo) Kitamura; *L. sororia* var. pilipes (Migo) Kitamura; *L. thirionnii* H. Léveillé; *Myctis sororia* (Miquel) Nakai; *M. sororia* var. nudipes Migo; *M. sororia* var. pilipes Migo; *Paraprenanthes hastata* C. Shih; *P. luchunensis* C. Shih; *P. pilipes* (Migo) C. Shih; *P. thirionnii* (H. Léveillé) C. Shih.

Herbs 0.5–1.5[–1.8] m tall, perennial. Stem glabrous or more rarely glandular hairy. Basal leaves withered at anthesis. Lower and middle stem leaves with petiole 3–7 cm, unwinged; leaf blade undivided and triangular-ovate to lanceolate or ± irregularly pinnatifid to ± linearly pinnatisect, glabrous, base cordate, truncate, or cuneate, margin ± sinuate and mucronately dentate; lateral lobes 1 or 2(or 3) pairs, sometimes alternate or unpaired, ovate to irregularly rhombic, 1–11 × 1–7 cm, smaller toward leaf base, apex rounded to acute; terminal lobe broadly triangular to broadly lanceolate, 5.5–15 × 5.5–15 cm, base hastate, cordate, truncate, or cuneate, margin often coarsely sinuate, apex acute. Upper stem leaves sessile or with a shorter winged petiole, smaller, less or not divided. Synflorescence narrowly paniculiform, with many capitula. Capitula with usually 10–15 florets. Involucre 9–11 × ca. 3 mm. Outer phyllaries ovate to lanceolate, longest ca. 4 × 1 mm, apex acute; inner phyllaries ± 8, apex obtuse to rounded. Florets purplish. Achene 4–5 mm, attenuate into a ca. 1 mm beaklike apex. Pappus 7–8 mm. Fl. and fr. May–Aug. 2n = 18*.

Mountain slopes, thickets in mountain valleys, forests; 200–3200 m. Anhui, Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hunan, Hubei, Jiangsu, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang (Japan, Vietnam).

*Paraprenanthes sororia* is the most widespread species of the genus and one of the two species distributed also outside China. Its circumscription and delimitation differ in the literature. *Paraprenanthes pilipes* and *P. sylvicola* have been considered either as specifically distinct or as conspecific, and *Lactuca diversifolia* (here treated as *P. diversifolia*) has been treated as a separate species and, more recently, as conspecific. This last species, however, clearly differs and is readily distinguished from *P. sororia* by its smaller capitula with only 5 inner phyllaries and 4–6 florets and by its endemic status in China. In contrast, *P. sylvicola* as treated in FRPS (80(1): 172. 1997), delimited by undivided leaves and glabrous upper stem portion, actually comprises
plants (or specimens) with undivided leaves of both *P. sororia* and *P. diversifolia*. The type of the name *P. sylvicola* represents *P. diversifolia*. Glandular hairy plants, which occur throughout the distribution range of *P. sororia*, were formally described as a variety (*Mecyst sororia var. pilipes*) from Japan and later upvalued to species rank as *P. pilipes*. However, the co-occurrence of entirely glabrous and apically glandular hairy plants is also known from other species in subtribe Lactucinae and is of no taxonomic value. *Paraprenanthes pilipes* is therefore treated as synonymous with *P. sororia*. *Paraprenanthes hastata*, with conspicuous undivided lanceolate to lanceolate-hastate middle stem leaves and glandular hairy upper stem portion, which is only known from the incomplete type material collected in Chongqing on Jinyan Shan, is here considered merely as a depauperate form of *P. sororia*. *Paraprenanthes luchanensis*, finally, combines two different elements, and we follow X. Zhuang (Fl. Yunnan. 13: 741. 2004) who included that name in the sense of its type in *P. sororia*; other collections cited in the protologue represent *P. polypodifolia*.


**Lin sheng jia fu wang cao** In sheng jia fu wang cao


Herbs 0.5–1.5 m tall, annual. Stem glabrous or apically glandular hairy. Lower stem leaves with petiole 4–9 cm, slender cuneately winged, base not clasping; leaf blade triangular, triangular-ovate, or broadly lanceolate, 7–18 × 4–24 cm, usually undivided, glabrous or sparsely glandular hairy, base cuneate, truncate, cordate, or hastate, margin sinuate and mucronately dentate, apex acute. Middle and upper stem leaves with a shorter narrow to broader winged petiole; leaf blade with a rather cuneate base, undivided and otherwise similar to lower leaves or lyrate pinnatifidate to lyrate pinnatisect; lateral lobes if present 1 or (or 3) pairs, triangular-ovate to elliptic; terminal lobe triangular-ovate to lanceolate, apex acute. Uppermost leaves sessile, elliptic to narrowly rhombic, undivided, base narrow and not clasping, apex acute. Synflorescence narrowly paniculiform, with some to numerous capitula. Capitula with 5–6 florets. Involucrue 9–12 × 2 mm. Outer phyllaries triangular-ovate to lanceolate, largest ca. 10 × 0.5 mm, apex acute; inner phyllaries 5, apex obtuse. Florets bluish-purple. Achene 4 mm, truncate into an almost beaked apex. Pappus 5 mm. Fl. May–Jul.

- Mountain valleys, forests; 600–1200 m. Guangxi, Guizhou (Leishan), Hunan, Jiangsu, Sichuan.

Panaprenanthes heptantha shows affinities to *P. diversifolia*, and future studies should assess the delimitation between both species.


**San lie jia fu wang cao** San lie jia fu wang cao


Herbs ca. 45 cm tall, perennial. Stem densely glandular hairy. Basal and lower stem leaves unknown. Middle stem leaves with petiole 1.5–1.5 cm, unwinged; leaf blade obovate to narrowly obovate lanceolate, 20–22 × 4–13 cm, pinnatisect to subpinnatisect, glabrous, margin sinuate to subulate and mucronately dentate; lateral lobes 4–7 pairs, opposite or alternate, sometimes petiolulate, ± narrowly elliptic, longest pair each 2.5–8 × 1–2.5 cm, decreasing in size toward base and if more than 4 pairs also toward leaf apex, lowermost pair smallest; terminal lobe elliptic to narrowly elliptic, apex acute to acuminate. Synflorescence paniculiform, with numerous capitula. Capitula with 5 florets. Involucrue 9–10 × 2–3 mm. Outer phyllaries ovate to lanceolate, largest ca. 3 × 1 mm, apex acute; inner phyllaries 5, linear-lanceolate, equal in length, apex obtuse. Florets purplish red to sometimes whitish. Achene ca. 4 mm, truncate into an almost beaked apex. Pappus 4–5 mm. Fl. and fr. Feb–Aug.

- Forests on mountain slopes; 1600–1700 m. Sichuan (Tianquan). *Paraprenanthes dolichophylla* was originally described on the basis of flowering material only. Recently collected material with ripe achenes revealed that the species is a member of *Paraprenanthes*, which has also been supported by the molecular analysis of that material.


**San lie jia fu wang cao** San lie jia fu wang cao

Herbs 40–90 cm tall, annual. Stem apically densely glandular hairy. Basal leaves unknown. Lower and middle stem leaves with petiole 2.5–10 cm, ± unwinged; leaf blade narrowly elliptic, 12–24 × 8.5–13 cm, lyrate pinnatifid or equally pinnatifid, base mucronate and mucronulate-dentate; lateral lobes 3 or 4 pairs, opposite or alternate, elliptic, triangular, or irregularly rhombic, apex obtuse to rounded; terminal lobe irregularly rhombic, lanceolate, or narrowly triangular. Upper stem leaves shortly petiolate; leaf blade linear-elliptic, ca. 10 × 1.3 cm, base cuneate, apex acuminate, otherwise similar to middle stem leaves. Synflorescence narrowly paniculiform, with many capitula. Capitula with 7 or 8 florets. Involucrue 9 × 2 mm. Outer phyllaries triangular-ovate to lanceolate, largest ca. 3 × 1 mm, apex acute; inner phyllaries 5, apex obtuse. Florets bluish-purple. Achene ca. 4 mm, truncate into an almost beaked apex. Pappus ca. 5 mm. Fl. and fr. May–Jul.
angular-ovate to semiornicular, somewhat smaller or ± equal in size to terminal lobe, apex rounded to acute; terminal lobe ± triangular-ovate, apex acute. Upper stem leaves with petiole shorter and ± winged; leaf blade triangular, smaller and less divided than in middle stem leaves or not divided, base cuneate, apex acuminate. Uppermost leaves lanceolate, triangular-lanceolate, or narrowly elliptic, pilose as upper stem, margin dentate or entire, apex acuminate. Synflorescence narrowly paniculiform, with some to many capitula. Capitula with usually 10–15 florets. Involucre 9–11 × ca. 3 mm. Outer phyllaries triangular-ovate to lanceolate, largest 2–3 × ca. 1 mm, apex acute; inner phyllaries 8, apex ± obtuse. Florets reddish. Achene ca. 4 mm, attenuate into an almost beaked apex. Pappus ca. 6 mm. Fl. and fr. May–Aug.

- Forests, forest margins; 600–800 m. Fujian, Hunan (Zhijiang), Jiangxi, Sichuan.


紫菊属 zi ju shu

Shi Zhu (石铸 Shih Chu); Norbert Kilian

Herbs, perennial. Stem erect, rarely scandent and ± zigzag, branched apically, glabrous or glandular hairy, leafy. Leaves pinately lobed, more rarely undivided. Synflorescence with few to numerous capitula and capitillaceous branchlets. Capitula pendent at anthesis, with 3–12 florets; peduncle capillaceous. Involucre narrowly cylindric. Phyllaries often tinged purple; outer phyllaries few, gradually longer centripetally, longest ca. 1/2 as long as inner ones; inner phyllaries 3(or 4), 5, or ca. 8, ± equal in length, ± linear-lanceolate to linear. Receptacle naked. Florets some shade of purple. Achene usually purplish to brownish red, cylindric to subfusciform, compressed, with 5 main ribs and 2 secondary ribs in between, apex truncate. Pappus white, single, of slender scabrid bristles.

About 11 species: China, Himalayan region; ten species (eight endemic) in China.

1. Herbs scandent; stem ± zigzag.
   1a. Inner phyllaries ca. 8; capitula with 10–12 florets ................................................................. 1. N. yakoensis
   1b. Inner phyllaries 4 or 5; capitula with 5–8 florets ................................................................. 2. N. scandens

2. Herbs not scandent; stem straight, erect.
   2a. Blade of lower and middle stem leaves not divided.
      2a. Lower and middle stem leaves hastate-triangular to rhombic; involucre at anthesis and in fruit less than 1.2 cm ................................................................. 3. N. rancianensis
      2b. Lower and middle stem leaves ovate to triangular-ovate; involucre at anthesis and in fruit 1.2–1.5 cm.
         2b. Middle stem leaves narrowly ovate, base cuneate, petiole winged; upper stem leaves sessile ................................................................. 4. N. guizhouensis
         2b. Middle stem leaves ovate to triangular-ovate, base cordate, truncate, or cuneate, petiole unwinged; upper stem leaves shortly petiolate ................................................................. 6. N. macilenta
   2b. Blade of lower and middle stem leaves pinnately lobed.
      7a. Terminal lobe of lower and middle stem leaves narrowly elliptic to lanceolate, always much exceeded in width by upper pair of lateral lobes separated by winged or unwinged rachis ........ 8. N. porphyrolepis
      7b. Terminal lobe of lower and middle stem leaves ovate, triangular-ovate, or broadly rhombic, not or slightly exceeded in width by upper pair of lateral lobes separated by winged or unwinged rachis.
         8a. Involucre at anthesis ca. 1.2 cm and in fruit to 1.6 cm ......................................................... 7. N. melanantha
         8b. Involucre at anthesis and in fruit 0.9–1.2 cm.
            9a. Involucre at anthesis ca. 1 cm and in fruit to 1.2 cm; achene basally more attenuate than apically; pappus not distinctly exceeding involucre in fruit ........................................ 5. N. yunnanensis
            9b. Involucre at anthesis ca. 0.9 cm and in fruit to 1 cm; achene apically more attenuate than basally; pappus distinctly exceeding involucre in fruit ........................................ 9. N. wilsonii
1. Notoseris yakoensis (Jeffrey) N. Kilian, comb. nov.

金佛山紫菊 ya kou zi ju


Vines 3–4 m, herbaceous, perennial. Stem scandent, ± zigzag, flexible, apically branched and glandular hairy, leafy. Stem leaves with petiole 1–3 cm, unwinged, glandular hairy, basally not widened; leaf blade triangular-ovate to lanceolate, 4–15 × 2–6 cm, both surfaces ± glandular hairy, base cordate to hastate, margin mucronately dentate, apex acuminate. Synflorescence terminal and in axils of upper leaves, divaricately paniculiform, with few to several capitula. Capitula with usually 10–12 florets; peduncle usually less than 1 cm. Involucre 1.1–1.4 × 0.3–0.5 cm. Phyllaries tinged purplish red; outer phyllaries ovate to lanceolate, largest 5–6 × ca. 1 mm, glandular hairy, apex rounded to obtuse; inner phyllaries ca. 8, glabrous to sparsely glandular hairy, apex rounded to obtuse. Florets purplish red. Achene pale to dark purple, cylindric to subfusiform, 4–5 mm, basally more attenuate than apically, somewhat attenuate below pappus disk. Pappus ca. 8 mm. Fl. and fr. Aug–Dec.

Forests, forest margins; 1300–2800 m. Yunnan [N Myanmar].

2. Notoseris scandens (J. D. Hooker) N. Kilian, comb. nov.

藤本紫菊 teng ben zi ju


Vines, herbaceous, perennial. Stem scandent, ± zigzag, flexible, apically branched and glandular hairy, leafy. Stem leaves with petiole 1–4 cm, unwinged, glandular hairy, basally not widened; leaf blade ovate, triangular-ovate, or lanceolate, 4–15 × 2–4–5 cm, both surfaces ± glandular hairy, margin mucronately dentate, apex acuminate. Synflorescence terminal and in axils of upper leaves, divaricately corymbose-paniculiform, with several to many capitula. Capitula with usually 5–8 florets; peduncle usually less than 1 cm. Involucre 11–14 × 2–3 mm. Phyllaries tinged purplish red; outer phyllaries ovate to lanceolate, largest 5–6 × ca. 1 mm, glandular hairy, apex acute; inner phyllaries 4 or 5, glabrous or sparsely glandular hairy, apex acute. Florets blue [or dull violet to reddish purple]. Achene pale [or dark purple], cylindric to subfusiform, 4–5 mm, basally more attenuate than apically, somewhat attenuate below pappus disk. Pappus ca. 0.7–1 cm. Fl. and fr. Nov–Dec.

Forests, forest margins; 900–2000 m. Xizang, Yunnan [NE India].


全叶紫菊 quan ye zi ju


Herbs 1.2–7 m tall. Stem solitary, erect, branched apically, glabrous, leafy. Middle stem leaves with petiole to 10 cm, distinctly winged, basally not widened and not clasping; leaf blade narrowly ovate, to 10 × 4.5 cm, undivided, base cuneate, margin mucronulately dentate, apex acuminate. Upper stem leaves sessile, narrowly elliptic, lanceolate, or narrowly elliptic-lanceolate, 8.5–17 × 1.5–4.5 cm. Synflorescence paniculiform, with numerous capitula and capillaceous branches. Capitula with ca. 5 florets; peduncle capillaceous. Involucre 12–14 × 2–3 mm. Phyllaries purplish red, abaxially glabrous; outer phyllaries broadly ovate to lanceolate, largest ca. 5 × 1–1.5 mm, apex obtuse to acute; inner phyllaries 5. Florets purplish red. Achene subfusiform. Pappus ca. 8 mm. Fl. and fr. Sep. 2n = 18*.

Mountain slopes; 1500–2000 m. Chongqing (Nanchuan).


云南紫菊 yun nan zi ju

Herbs, 1–2.7 m tall. Stem solitary, erect, branched apically, glabrous, leafy. Middle stem leaves with petiole 5–20 cm, unwinged; leaf blade ovate, 16–22 × 12–15 cm, lyrate-pinnatisect, margin mucronulately dentate; lateral lobes 1–3 pairs, narrowly elliptic, 6–10 × 2–5 cm, apex obtuse; terminal lobe rhombic to elliptic, 10–13 × 4–10 cm, base cuneate, apex acuminately. Upper stem leaves with shorter petiole to sessile, usually smaller and less divided to undivided, otherwise similar to middle stem leaves. Synflorescence paniculiform, with numerous capitula. Capitula with 4 or 5 florets. Involucre ca. 10 × 2.5–3 mm at anthesis, to 1.2 cm in fruit. Phyllaries purplish red, abaxially glabrous, apex obtuse; outer phyllaries linear-lanceolate to narrowly elliptic, largest 4–6 × ca. 1 mm; inner phyllaries 5. Florets purple. Achene ca. 5 mm, basally more attenuate than apically. Pappus 7–8 mm. Fl. and fr. Sep–Oct.

Dense forests; 1200–2200 m. S Yunnan (Yanshan).


光苞紫菊 guang bao zi ju

Herbs 30–130 cm tall, perennial. Stem solitary, erect, branched apically, glabrous or glandular hairy, leafy. Basal, lower, and middle stem leaves with petiole 8–25 cm, unwinged, basally not or slightly widened; leaf blade ovate, triangular-ovate, or more rarely suborbicular, 7–30 × 4.5–23 cm, adaxially ± glandular hairy, base cordate, truncate, or cuneate, margin mucronulately dentate, apex acute to acuminate. Upper stem leaves similar to middle stem leaves but smaller and with petiole shorter and often apically cuneately winged; leaf blade triangular to narrowly rhombic, basally usually cuneate, apically acute to acuminate. Uppermost leaves sessile, narrowly rhombic to narrowly elliptic, base cuneate, apex acuminate. Synflorescence paniculiform, with numerous capitula. Capitula with 5 florets. Involucre ca. 12 × 2–3 mm at anthesis, ca. 1.5 cm in fruit. Phyllaries purple, abaxially glabrous; outer phyllaries triangular-ovate to linear-lanceolate, longest ca. 7 × 1 mm; inner phyllaries 5, apex acute. Florets purplish red. Achene 5–6 mm, basally more attenuate than apically. Pappus 8–9 mm. Fl. and fr. Sep.–Nov.

By water in mountain valleys, forests; 800–2300 m. Chongqing, Guanxi, Guizhou, Hunan, Yunnan.

The name *Prenanthes macilenta* predates the previously accepted name *Notoseris psilolepis*. *Notoseris macilenta* is closely related to *N. melanantha* and is distinguished by its leaves undivided throughout.


8. *Notoseris formosana* (Kitamura) C. Shih; *N. gracilipes* C. Shih; *N. henryi* (Dunn) C. Shih; *N. rhombiformis* C. Shih; *Prenanthes formosana* Kitamura; *P. henryi* Dunn.

Herbs 0.5–2 m tall, perennial. Stem solitary, erect, apically branched and glabrous or glandular hairy, leafy. Lower and middle stem leaves with petiole 3–17 cm, ± unwinged, basally not widened; leaf blade pinnatipartite to pinnatisect or lyrately so, rarely some leaves undivided, margin mucronulately dentate (sometimes very coarsely so) and sometimes ± sinuate; lateral lobes 1–3 pairs, opposite to subopposite, elliptic, irregularly rhombic, or obovate, 1–10 × 5–6 cm, base truncate, cuneate, or subpetiolulate, apex obtuse to acute; terminal lobe broadly elliptic, triangular-ovate, or rhombic, 4–22 × 3–20 cm, base cordate, truncate, or cuneate, apex obtuse, rounded, or acute. Upper stem leaves similar to middle stem leaves but with shorter petiole to sessile, smaller and less or not divided. Synflorescence narrowly paniculiform, with numerous capitula. Capitula with 5(or 6) florets. Involucre ca. 12 × 2–3 mm at anthesis, to 1.6 cm in fruit. Phyllaries purplish, abaxially glabrous; outer phyllaries triangular, linear-elliptic, or lanceolate, largest 4–6 × 1–1.5 mm, apex acute; inner phyllaries 5, apex ± rounded. Florets bluish purple to pink. Achene 4–6 mm, basally more attenuate than apically. Pappus 7–9 mm. Fl. and fr. Jun.–Dec. 2n = 18*.

Forests, forest margins; 1300–2700 m. Chongqing, Guangdong, Guanxi, Guizhou, Hunan, Sichuan, Taiwan, Yunnan.

*Notoseris melanantha* is here treated in a wide sense, including several other species previously distinguished only by rather subtle leaf and indumentum features. As here treated, it is well characterized by its pinnatipartite to pinnatisect leaves with a broad, triangular to triangular-ovate or broadly rhombic terminal lobe and its 1.2–1.6 cm involucres with 5 inner phyllaries. Comparing the type material of *N. melanantha* and *N. henryi*, which were apparently described independently of each other a few years apart, with a larger number of specimens referable to either of them, it becomes evident that a continuous variation in leaf shape closely knits all of these specimens. The rich type material of *N. melanantha* represents a form with pinnatipartite to pinnatisect lower and middle stem leaves, the rachis of which is distinctly to broadly winged at least between the broad, triangular-ovate terminal lobe and the upper pair of lateral lobes and narrowly winged between the pairs of lateral lobes, and the lateral lobes of which have a broad base. The syntypes of *N. henryi*, A. Henry 7022 and A. Henry 11214, in contrast, have pinnatisect lower and middle stem leaves with usually unwinged rachis, lateral lobes with narrow or even subpetiolulate base, and a broad, triangular-ovate to rhombic terminal lobe. This latter leaf shape appears to be much more common. As *N. melanantha* predates the name *N. henryi* for a few years, the former is the correct name for the commonest and most widespread *Notoseris* species. Three further species, *N. formosana*, *N. gracilipes*, and *N. rhombiformis*, apparently each represent only part of this continuous variation, making their delimitation practically impossible. Of these, *N. rhombiformis* refers to plants with a broad, distinctly rhombic terminal lobe separated by the unwinged rachis from the uppermost pair of lateral lobes, a form also represented by the syntype A. Henry 11214 and approximately by part of the material of the syntype A. Henry 7022 of *N. henryi*, while *N. gracilipes* and *N. formosana* refer to pinnatisect-leafy plants with a broadly triangular terminal lobe and were moreover distinguished by indumentum characters.


Herbs 0.7–1.5 m tall, perennial. Stem solitary, erect, branched apically, glabrous, leafy. Basal and middle stem leaves with petiole ca. 4.5 cm, unwinged, basally not widened; leaf blade pinnatipartite to subpinnatisect, margin mucronulately dentate and lobe margin mucronate or with 1 large triangular tooth on one side; lateral lobes 2 or 3 pairs, narrowly elliptic to narrowly rhombic, 3–4 × 1–1.5 cm, base truncate, apex acute to acuminate; terminal lobe narrowly elliptic to obliquely narrowly elliptic, 3–4 × 1–1.5 cm, apex acute to acuminate. Upper stem leaves narrowly elliptic to narrowly elliptic-lanceolate, ca. 5.5 × 1 cm, undivided, apex acuminate. Synflorescence paniculiform, with numerous capitula. Capitula with ca. 5 florets. Involucr 13–15 × 2–3 mm. Phyllaries purplish to abaxially glabrous, apex rounded to obtuse; outer phyllaries lanceolate to linear-lanceolate, longest ca. 6 × 1–1.5 mm; inner phyllaries 5. Florets purple. Achene ca. 5 mm, basally more attenuate than apically. Pappus ca. 8 mm. Fl. and fr. Sep. 2n = 18*.

Forests on mountain slopes; 1800–1900 m. Chongqing (Nanchuan), Guizhou.

*Notoseris porphyrolepis* is closely related to *N. melanantha* and mainly distinguished by the leaf shape, as given in the key.

南川紫菊 *nan chuan zi ju*

Herbs 0.7–1.5 m tall, perennial. Stem solitary, erect, branched apically, glabrous, leafy. Basal and middle stem leaves with petiole ca. 4.5 cm, unwinged, basally not widened; leaf blade pinnatipartite to subpinnatisect, margin mucronulately dentate and lobe margin mucronate or with 1 large triangular tooth on one side; lateral lobes 2 or 3 pairs, narrowly elliptic to narrowly rhombic, 3–4 × 1–1.5 cm, base truncate, apex acute to acuminate; terminal lobe narrowly elliptic to obliquely narrowly elliptic, 3–4 × 1–1.5 cm, apex acute to acuminate. Upper stem leaves narrowly elliptic to narrowly elliptic-lanceolate, ca. 5.5 × 1 cm, undivided, apex acuminate. Synflorescence paniculiform, with numerous capitula. Capitula with ca. 5 florets. Involucr 13–15 × 2–3 mm. Phyllaries purplish to abaxially glabrous, apex rounded to obtuse; outer phyllaries lanceolate to linear-lanceolate, longest ca. 6 × 1–1.5 mm; inner phyllaries 5. Florets purple. Achene ca. 5 mm, basally more attenuate than apically. Pappus ca. 8 mm. Fl. and fr. Sep. 2n = 18*.

Herbs to 1 m tall, perennial. Stem erect, apically branched and glandular hairy, basally glabrous, leafy. Lower and middle stem leaves with petiolo 3.5–8 × 2–2.5 cm, ± unwinged and base slightly widened in lower leaves, narrowly winged and base sometimes auriculately widened in middle leaves; leaf blade pinnatipartite to pinnatisect and sometimes lyrate so, margin ± sinuate and mucronulately dentate and sometimes subobtusely so; lateral lobes 4–5 pairs, opposite or alternate, sessile to subpetiolulate, ovate, triangular-ovate, or elliptic, 1–7 × 1–4 cm, often unequal, upper ones sometimes subdividing terminal lobe; terminal lobe triangular, triangular-ovate, or rhombic, 7–12 × 3–10 cm, base truncate to cuneate, margin sometimes lobulate, apex acute to acuminate. Upper stem leaves similar to middle stem leaves but sessile or with shorter usually broader winged petiolo, sometimes smaller and fewer. Synflorescence paniculiform, with numerous capitula. Capitula with 4 or 5 florets. Involucre 9–10 × ca. 2 mm. Phyllaries purple, glabrous; outer phyllaries triangular-ovate to linear-lanceolate, largest 4–5 × 1 mm, apex acute; inner phyllaries 5. Flores purplish blue. Achene 3–6 mm, apically usually more attenuate than basally. Pappus 6–7 mm, exserted from involucre at maturity. Fl. and fr. May–Jul.

- Forests, forest margins; 1000–2800 m. Sichuan (Emei Shan, Wenchuan).


三花紫菊 san hua zi ju


Herbs, to 1 m tall, perennial. Stem solitary, erect, branched apically, sparsely glandular hairy, leafy. Lower and middle stem leaves with petiolo to 17 cm, narrowly winged, basally usually slightly widened; leaf blade lyrateally pinnatipartite to subpinnatisect, margin ± sinuate and mucronulately dentate; lateral lobes 1 or 2(3) pairs, ± elliptic, 2–6 × 1–4 cm, base cuneate to petiolulate, apex rounded to obtuse; terminal lobe triangular to triangular-ovate, 12–19 × 11–20 cm, base shallowly cordate, hastate, cuneate, or rounded, apex acuminate to acute. Upper stem leaves with petiolo shorter, basally slightly widened, or distinctly widened and ± auriculately clasping or ± sessile and auriculately clasping; leaf blade smaller and often less divided, otherwise similar to middle stem leaves; uppermost leaves narrowly elliptic, narrowly rhombic, or broadly linear, undivided. Synflorescence paniculiform, with numerous capitula. Capitula with 3 or 4 florets. Involucr 10–12 × 1.5–2 mm. Phyllaries purple, glabrous; outer phyllaries narrowly ovate to linear-lanceolate, longest ca. 5 × 1 mm, apex acute; inner phyllaries 3 or 4, apex obtuse to acute. Flores bluish purple. Achene 4–5 mm, basally more attenuate than apically. Pappus ca. 7 mm. Fl. and fr. Jul–Oct. 2n = 18*.

- Grasslands, forests; 1400–3000 m. Chongqing, Sichuan (Emei Shan), Yunnan (Tengchong).

Notoseris triflora seems to have a scattered, disjunct distribution in C and SW China. It is apparently closely related to Notoseris khasiana (C. B. Clarke) N. Kilian, comb. nov. (basionym: Prenanthes khasiana C. B. Clarke, Compos. Ind. 273. 1876), which has a scattered distribution in NW Myanmar, NE India (Assam), and perhaps Bhutan. The available material of N. triflora shows some variation with respect to leaf shape; therefore, a comparative study of its disjunct populations, as well as those of N. khasiana, would be desirable.


莴苣属 wo ju shu

Shi Zhu (石铸 Shih Chu); Norbert Kilian

Agathyrsus D. Don; Lactuopsis Schultz Bipontinus ex Visiani; Lagedium Soják; Mulgedium Cassini; Phaenixopus Cassini; Pterocypsela C. Shih; Scariola F. W. Schmidt; Steptorhamphus Bunge.

Herbs, perennial or annual, more rarely subshrubs (only Lactuca orientalis in China). Stems usually leafy. Leaves pinnate or undivided. Capitula with 4–30 or more florets. Involucrre narrowly cylindric. Phyllaries glabrous or hairy; outer phyllaries gradually longer centripetally, ± imbricate, often ca. 1/2 as long as inner phyllaries or even ± approaching them in length; inner phyllaries usually 3, 5, or 8, ± linear-lanceolate to ca. inner phyllaries equal in length in fruit. Receptacle naked. Flores some shade of yellow or blue. Achene narrowly or broadly ellipsoid, body subcompressed to compressed, between 2 thicker or wider lateral ribs with 1 to several slender ribs on either side; beak usually present, stout, slender, or filiform. Pappus white or sometimes with a faint yellow tinge, single, of slender scabrid bristles [or double with an additional outer row of minute hairs].

Probably ca. 50–70 species: mostly in C and SW Asia, Europe, North America; 12 species (one endemic, one introduced) in China.

The circumscription of the genus is not yet settled, and species numbers given in the literature therefore vary greatly. The concept of the genus applied here on the basis of molecular and morphological studies by N. Kilian et al. (in prep.) is wider than the one adopted in FRPS (80:1); 233–239. 1997) and includes, as far as China is concerned, the former segregates Mulgedium, Pterocypsela, and Scariola.

1a. Subshrubs, stems whitish, rigid, and intricately and divaricately branched; stem leaf bases similar to middle stem leaves but sessile or with shorter usually broader winged petiolo, sometimes smaller and fewer. Synflorescence paniculiform, with numerous capitula. Capitula with 4(5) florets. Involucrre 9–10 × ca. 2 mm. Phyllaries purple, glabrous; outer phyllaries triangular-ovate to linear-lanceolate, largest 4–5 × 1 mm, apex acute; inner phyllaries 5. Flores purplish blue. Achene 3–6 mm, apically usually more attenuate than basally. Pappus 6–7 mm, exserted from involucre at maturity. Fl. and fr. May–Jul.

lb. Annual to perennial herbs, stems not as above; stem leaf bases never adnately decurrent on stem; capitula with 3 or 4 florets. Involucrre 10–12 × 1.5–2 mm. Phyllaries purple, glabrous; outer phyllaries narrowly ovate to linear-lanceolate, longest ca. 5 × 1 mm, apex acute; inner phyllaries 3 or 4, apex obtuse to acute. Flores bluish purple. Achene 4–5 mm, basally more attenuate than apically. Pappus ca. 7 mm. Fl. and fr. Jul–Oct. 2n = 18*.

2a. Achene body strongly compressed with distinctly winged margin.

3a. Inner phyllaries 5(6); achene with 3–5 prominent ribs on either side

3b. Inner phyllaries 6; achene with 1(2) prominent rib(s) on either side.
Lactuca undulata

Herbs 10–35 cm tall or more, annual. Stems solitary or few, erect, divaricately branched from base or higher up, glabrous. Leaves glaucous green to glaucous; lower and middle stem leaves oblanceolate to narrowly elliptic, 2–5 × 1–2 cm, glabrous, base clasping stem and auriculate, margin sinuate-dentate to pinnately lobed; uppermost stem leaves linear-lanceolate, margin entire or subentire, apex acuminate. Capitula numerous, terminal, with 8–12 florets; peduncle wiry, usually shorter than capitulum. Involucre narrowly cylindric and ca. 6 mm at anthesis, to 1.3 cm in fruit; achene beak white. Lower and middle stem leaves distinctly clasping stem.

4a. Leaves not clasping or scarcely clasping stem .............................................................................................. 6. L. indica
4b. Middle and upper stem leaves distinctly clasping stem.

5a. Achene beak stout, 0.1–0.5 mm, apically pale ........................................................................................................ 5. L. triangulata
5b. Achene beak filiform, 2–3.5 mm, pale to greenish ......................................................................................... 7. L. formosana

2b. Achene body strongly compressed to subcompressed but margin not winged.

6a. Achene subcompressed, very narrowly ellipsoid, apically attenuate or contracted into a stout 1–2 mm beak.
7a. Lower and middle stem leaves usually pinnately lobed, base usually narrowed and semiamplexicaul; achene with 5–7 prominent ribs on either side between marginal ribs, marginal ribs slightly thicker than other main ribs ................................................................................................................................. 9. L. tatarica
7b. Lower and middle stem leaves entire or more rarely sinuate-dentate to pinnately lobed, base usually semiamplexicaul to auriculate; achene with 4 or 5 narrow ribs in middle third of either face and with very thick marginal ribs .............................................................................................................................. 10. L. sibirica

6b. Achene compressed, apically contracted into a filiform (2–4)–12 mm beak.

8a. Beak of achene 10–12 mm, base with rodlike appendages; achene body with 1 rib on either side; involucre to 2.3 cm in fruit .............................................................................................................................. 1. L. undulata
8b. Beak of achene to 5 mm, base without appendages; achene body with 3–9 ribs on either side; involucre to 1.6 cm in fruit.

9a. Florets blue; achene body with 3–5 ribs on each side.
10a. Lower leaves obovate to elliptic, always pinnately lobed with broader segments; capitula ca. 6 mm at anthesis, to 1.3 cm in fruit; achene beak white ................................................................................................................................. 2. L. dissecta
10b. All leaves linear, margin entire or lower ones pinnately lobed with linear entire segments; capitula 9–10 mm at anthesis, to 1.6 cm in fruit; achene beak greenish ................................................................................................................................. 3. L. dolichophylla

9b. Florets yellow; achene body with 5–9 ribs on each side.

11a. Stem leaves undivided, abaxially with smooth midrib; phyllaries usually erect in fruit; achene with 5–7 ribs on each surface ......................................................................................................................... 11. L. sativa
11b. Stem leaves pinnately lobed, abaxially usually with prickly setose midrib; phyllaries usually reflexed in fruit; achene with 7–9 ribs on each surface ......................................................................................................................... 12. L. serriola


飘带果 piao dai guo

Lactuca undulata var. albicaulis C. H. An; L. undulata var. pinnatifolius Turczaninow.

Herbs 10–35 cm tall or more, annual. Stems solitary or few, erect, divaricately branched from base or higher up, glabrous. Leaves glaucous green to glaucous; lower and middle stem leaves oblanceolate to narrowly elliptic, 2–5 × 1–2 cm, glabrous, base clasping stem and auriculate, margin sinuate-dentate to pinnatisect; lateral lobes 2–6 pairs; terminal lobe lanceolate to elliptic. Upper stem leaves smaller and less or not divided; uppermost stem leaves linear-lanceolate, margin entire or subentire, apex acute. Capitula numerous, terminal, with 8–12 florets; peduncle wiry, usually shorter than capitulum. Involucre narrowly cylindric and 7–9 mm at anthesis, longish ovoid and to 2.3 × 0.5–0.6 cm in fruit. Phyllaries glabrous, with an apical purplish spot; outer phyllaries ovate to linear-lanceolate, longest ca. 3/4 as long as inner phyllaries, apex acute; inner phyllaries ca. 5, apex subobtuse to acute. Florets pale blue to purple. Achene body pale to dark brown, obovoid, ca. 3 mm, compressed, with 1 rib on either side; beak whitish, filiform, 1–1.2 cm, base with 2 rodlike pendent appendages. Pappus 4–5 mm. Fl. and fr. May–Sep. 2n = 18.

Moist areas on mountain slopes, mountain valleys; 500–2000 m. Xinjiang [Afghanistan, Kashmir, Kazakhstan, Kyrgyzstan, Pakistan, SC Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].


裂叶莴苣 lie ye wo ju

Lactuca auriculata Candolle.

Herbs ca. 40 cm tall, annual. Stem solitary, erect, simple or divaricately branched from base; branches slender, glabrous. Leaves glabrous, base sagittately to auriculately clasping stem. Lower and middle stem leaves obovate, spatulate, or elliptic, 3–7 × 1–3.5 cm, pinnatifid to subpinnatisect, margin entire or sparsely dentate; lateral lobes 3–6 pairs, rhombic, flabelliform, or orbicular, apex rounded to acute; terminal lobe rhombic, apex acute. Upper stem leaves lanceolate to linear-lanceolate, smaller, less or not divided, apex acuminate. Synflorescence corymbiform, with some to numerous capitula. Capitula with ca. 15 florets; peduncle capillaceous, usually longer than capitulum. Involucre narrowly cylindric and ca. 6 mm at anthesis, longish ovoid and to 1.3 × 0.3–0.4 cm in fruit. Phyllaries abaxially purplish red, glabrous, apex acute; outer phyllaries ovate to linear-lanceolate, approaching inner phyllaries to 3/4 their length; inner phyllaries ca. 5. Florets blue to bluish purple [or pale yellowish]. Achene body pale brown to blackish, obovoid, ca. 2.5 mm, compressed, with 3 ribs on either side; beak white, filiform, 4–4.5 mm. Pappus 3–4 mm. Fl. and fr. Jun. 2n = 16.

Grasslands; ca. 2000 m. Xinjiang, ?Xizang [Afghanistan, Bhutan, India (Sikkim), Kashmir, Kazakhstan, Kyrgyzstan, Nepal, Pakistan, Tajikistan; SW Asia].


长叶莴苣 chang ye wo ju

Mulgedium sagittatum Royle, Ill. Bot. Himal. Mts. 252, t. 61, f. 2. 1835; Lactuca handeliana S. Y. Hu; L. longifolia Candolle (1838), not Michaux (1803); L. wallichiana Tuil., nom. illeg. superfl.
Herbs ca. 1 m tall, annual or biennial. Stem solitary, erect, paniculate apically, glabrous. Lower stem leaves linear to linear-lanceolate, undivided or pinnately lobed, base sagittately clasping stem, apex acuminate; lobes when present linear, apex acute. Upper stem leaves undivided, smaller, otherwise similar to lower leaves. Synflorescence paniculiform, with numerous capitula. Capitula with 12–20 florets; peduncle wiry. Involucre narrowly cylindric and 9–10 mm at anthesis, ovoid and to 1.6 × 0.8 cm in fruit. Phyllaries apically purplish red, abaxially glabrous, apex acute; outer phyllaries triangular-ovate to linear-lanceolate, approaching inner phyllaries to 3/4 their length; inner phyllaries ca. 5. Florets blue. Achene body dark brown, ellipsoid, compressed, broadly winged, 1.5–2 mm wide, with 1(or 2) prominent ribs on either side, apically contracted into an apically pale stout 0.1–0.5 mm beak. Pappus 6–8 mm. Fl. and fr. Jun–Sep. 2n = 16.

Thickets; ca. 3200 m. Xizang, Yunnan [Afghanistan, Bhatan, India, Kashmir, Myanmar, Nepal, Pakistan].


毛脉翅果菊 mao mai chi guo ju

*Lactuca alliiarticata* H. Léveillé & Vaniot; *L. elata* H. Léveillé; *L. raddeana* var. elata (Hemsley) Kitamura; *L. vaniotii* H. Léveillé; *Prenanthes hieracifolia* H. Léveillé; *Pterocyypsela elata* (Hemsley) C. Shih; *P. raddeana* (Maximowicz) C. Shih.

Herbs 0.8–2 m tall, biennial or perennial. Roots ramose. Stem solitary, erect, basal half ± densely hispid, apical half glabrous and branched. Lower and middle stem leaves with basal portion cuneate or winged petiolo-like, 2–10 cm; apical portion ovate, elliptic, or triangular, 5–16 × 2–8.5 cm, undivided, pinnatisparte, or lyrate pinnatisparte, ± hispid, margin dentate and coarsely sinuate-dentate; lateral lobes 1–3 pairs, elliptic, apex acute; terminal lobe triangular, ovate-triangular, or subrhombic, apex acute. Upper stem leaves with basal portion shorter, winged, and petiolo-like to cuneate, apical portion ovate, elliptic, or lanceolate. Synflorescence narrowly paniculiform, with numerous capitula on wiry branches. Capitula with 8–11 florets. Involucre cylindric, 8–10 mm at anthesis, 9–11 × 4–5 mm in fruit. Phyllaries often pale purplish red; outer phyllaries triangular-ovate to lanceolate, largest ca. 5 × 1–2 mm, apex obtuse; inner phyllaries 5(or 6), apex obtuse. Florets bright yellow. Achenes 3–4 mm; body reddish to dark brown, ellipsoid, compressed, broadly winged, 1.5–2 mm wide, with 3(or 5) prominent ribs on either side, apically contracted into a concolorous or apically pale stout 0.2–0.4 mm beak. Pappus 6–7 mm, ± caducous. Fl. and fr. May–Oct. 2n = 18.

Grasslands on mountain slopes, mountain forests, forest margins, trailsides; 700–1900 m. Hebei, Heilongjiang, Jilin, Liaoning, Shanxi [Japan, Korea, SE Russia].


翅果菊 chi guo ju

*Brachyrrhampus sinicus* Miqel; *Lactuca amurensis* Regel & Maximowicz ex Regel; *L. brevirostris* Champion ex Bentham; *L. cavaleriei* H. Léveillé; *L. indica* f. indivisa (Maximowicz) H. Hara; *L. indica* f. runcinata (Maximowicz) Kitamura; *L. koyangensis* H. Léveillé; *L. lacinata* (Houttuy) Makino (1903), non Roth (1977); *L. squarrosa* (Thunberg) Miquel; *L. squarrosa* var. dentata Komarov; *L. squarrosa* f. indivisa Maximowicz; *L. squarrosa* var. integrifolia Komarov; *L. squarrosa* var. lacinata (Houttuy) Kuntze; *L. squarrosa* f. runcinata Maximowicz; *L. squarrosa* var. runcinatopinnatifida Komarov; *Prenanthes lacinata* Houttuy; *P. squarrosa* Thunberg; *Pterocyypsela indica* (Linnaeus) C. Shih; *P. lacinata* (Houttuy) C. Shih.

Herbs 0.4–2 m tall, annual or perennial. Roots narrowly thickened. Stem solitary, stout, erect, branched apically, glabrous. Lower and middle stem leaves 13–37 × 0.5–20 cm, glabrous, base semiamplexicaul to weakly amplexicaul, margin entire or sparsely dentate, apex obtuse to acuminate; shape and incision extremely variable; shape ranging from linear-lanceolate, linear-elliptic, lanceolate, spatulate, to elliptic; incision ranging from entire, pinnatifid, deeply pinnatifid, to bipinnatifid, with segments mostly narrow, linear, falcate, triangular-lanceolate, or also indicative that comparable variation in leaf shape can also be observed in *L. indica* and *L. formosana*.
elliptic, apex acute to acuminate. Upper leaves smaller, linear-lanceolate, linear, or elliptic, less incised to entire. Synflorescence paniculiform to racemiform-paniculiform, with numerous capitula. Capitula with usually 20–30 florets. Involucre cylindric, 1–1.1 cm at anthesis, 1.2–1.5 × 0.6–0.8 cm in fruit. Phyllaries usually with a purplish margin, apex usually obtuse to rounded; outer phyllaries ovate to lanceolate, longest ca. 6 × 1.5–2 mm; inner phyllaries 8. Florets pale yellow, bluish purple on drying. Achenes 3–5 mm; body reddish brown, dark brown, or blackish brown, ellipsoid, compressed, broadly winged, 1.2–2.5 mm wide, with 1 prominent rib on either side, apically contracted into an apically pale to greenish subfiliform 0.4–1.6 mm beak. Pappus 7–8 mm, caducous. Fl. and fr. Apr.–Nov. 2n = 18*.

Mountain valleys, forests, forest margins, thickets, ravines, fields, wastelands; 200–3000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang. (Bhutan, India, Indonesia, Japan, Korea, Philippines, E Russia, Thailand, Vietnam; introduced elsewhere).


台湾翅果菊 tai wan chi guo ju

*Lactuca morii* Hayata; *L. sonchus* H. Léveillé & Vaniot; *Pterocypsela formosana* (Maximowicz) C. Shih; *P. sonchus* (H. Léveillé & Vaniot) C. Shih.

Herbs 0.5–1.5 m tall, annual or ?perennial. Roots ramose. Stem solitary, erect, loosely branched apically, ± hirsute, glabrescent. Lower and middle stem leaves with narrow petiole-like amplexicaul basal portion to 5 cm or with conspicuously expanded and semiamplexicaul base; leaf blade elliptic, lanceolate, or oblanceolate, 8–18 × 4–8 cm, hirsute, main rib echinulate, undivided and with coarsely dentate margin or pinnatifid with 2–5 pairs of elliptic to broadly falcate lateral lobes, faintly to strongly dentate on margin, and a lanceolate or triangular terminal lobe. Upper stem leaves similar to middle stem leaves, margin mostly ± entire. Synflorescence loosely corymbose, with ca. 10 to many capitula. Capitula with usually 25–30 florets. Involucre cylindric, 1–1.1 cm at anthesis, to 1.8 × 0.8 cm in fruit. Phyllaries acute to acuminate at apex; outer phyllaries broadly obovate to lanceolate, longest ca. 8 × 1–2 mm; inner phyllaries 8. Florets yellow. Achenes 4.5–6.5 mm; body reddish brown, dark brown, or blackish brown, ellipsoid, compressed, broadly winged, 2–2.3 mm wide, with 1 prominent rib on either side, apically contracted into a usually pale to greenish subfiliform 2–3.5 mm beak. Pappus 7–8 mm, caducous. Fl. and fr. Apr.–Nov. 2n = 18*.

- Grasslands on mountain slopes and in valleys, thickets or forests on mountain slopes, fields, along trails; 100–2000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hebei, Hunan, Jiangsu, Jiangxi, Ningxia, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang.

*Lactuca formosana* is similar to *L. raddeana*, *L. triangulata*, and *L. indica*, and the leaf shape of *L. formosana* in mainland China shows some variation. Instead of the typically lyrate-pinnatifid leaves with irregularly incised to dentate margin, plants sometimes have narrow, weakly pinnatifid leaves more similar to those of *L. indica*. However, usually both species can be distinguished by the shape of the synflorescence (corymbiform in *L. formosana*, paniculiform to racemiform-paniculiform in *L. indica*) and the indumentum of stem and leaves (hirsute and with echinulate main rib in *L. formosana*, glabrous in *L. indica*). Conspicuous, occasionally occurring plants with all or most leaves undivided, as are sometimes the upper stem leaves in usually pinnately lobed plants, have been treated as a separate species, *Lactuca sonchus* or *Pterocypsela sonchus*, respectively (e.g., FRPS 80(1): 231. 1997), but are here considered as a mere form of *L. formosana*, easily recognizable by the distinctive long beak of this species.


雀舌 que ju


Subshrubs (10–)20–60 cm tall, glabrous or subglabrous, spinous, branched from base. Stems whitish, rigid, intricately and divaricately branched. Leaves glaucous green. Basal leaves rosulate, sinuate-dentate to pinnately lobed; lateral lobes 2–4 pairs, triangular, retorse, apex acute. Stem leaves similar to basal leaves but smaller, less incised, and basally with linear auricles adnately long decurrent on stem. Capitulum solitary, terminal and pedunculate or lateral and sessile, with 4(or 5) florets; peduncle (when present) subulate, remaining as a spine after shedding of capitulum. Involucre narrowly cylindric, 7–10 mm at anthesis, to 1.5 cm in fruit. Phyllaries green to bluish purple; outer phyllaries ovate, abaxially pubescent; inner phyllaries 3(or 4), apex obtuse. Florets pale yellow. Achenes 7–8 mm; body brownish, narrowly ellipsoid, 1–1.3 mm wide, with 5–7 ribs on either side; bead concolorous, stout, 2–3 mm. Pappus 7–8 mm, caducous. 2n = 18, 36.

Mountain slopes and scree, on clay or loamy soil, on lime deposits, on gravel, in dry ravines; below 3800 m. Xinjiang [Kashmir, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan; SW Asia].

*Lactuca orientalis* reaches China apparently only in the extreme northwest. No material from China was seen; the description is based on material from outside of China and the habitat data is from Fl. URSS (29: 321. 1964).


台灣翅果菊 tai wan chi guo ju


Herbs 15–60 cm tall, perennial, with a taproot, roots shoot bearing. Stem erect; branched apically, glabrous, leafy mainly in basal part. Leaves grayish green to glaucous, rigid, glabrous.
Lower and middle stem leaves elliptic, narrowly elliptic, or linear, 6–19 × 2–6 cm, narrowed toward base, pinnatisect, pinnatifid, or coarsely dentate, apex acute to obtuse; lateral lobes 2–5 pairs, subelliptic to triangular, margin entire, denticulate, or spinulose; terminal lobe lanceolate to narrowly triangular, margin entire, denticulate, or spinulose. Upper stem leaves similar to middle stem leaves but smaller and less incised. Synflorescence racemiform to corymbose paniculiform, almost leafless, usually with numerous capitula. Capitula with ca. 20 florets. Involucr e cylindric, 1.1–1.4 × 0.3–0.5 cm at anthesis, to 2 cm in fruit. Phyllaries usually tinged purplish red, glabrous, apex acute to obtuse; outer phyllaries ovate to lanceolate; inner phyllaries ca. 8. Florets usually purplish blue to blue, rarely white. Achen e 5–6 mm; body dark gray, columnar to very narrowly ellipsoid, subcompressed, with 5–7 ribs on either side, apically attenuate or contracted into a concolorous or pale stout 1–2 mm beak. Pappus ca. 1 cm. Fl. and fr. Jun–Sep. 2

Riverbanks and terraces, by lakes, meadows, by fields, consolidated sand dunes, gravelly places; 1200–4300 m. Gansu, Hebei, Henan, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi, Xinjiang. Xizang [Afghanistan, NW India, Kashmir, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, C and W Russia, Tajikistan, Uzbekistan; SW Asia, Europe, North America].

*Lactuca tatarica* is a very widespread and considerably variable species. *Mulgedium roborovskii* is considered not to exceed the variation of the species and is included here. *Mulgedium alatum* is tentatively included here from the insufficient original description, as no type material has been seen.


山萵苣 *shan wo ju*

*Sonchus sibiricus* Linnaeus, Sp. Pl. 2: 795. 1753; *Lagesteb me dikum sativum* Ledebour; *M. sibiricum* (Linnaeus) Lessing.

Herbs 25–100 cm tall, annual or biennial. Stem solitary, whitish, yellowish green, or glaucous green, erect, branched apically, glabrous. Leaves green, glabrous, rather soft. Basal and lower stem leaves sessile, oblong lanceolate to elliptic-oblancoceolate, 6–15 × 1.5–6.5 cm, undivided, base cordate to sagittate and semiamplexicaul, margin sinuato-dentate, apex acute, acuminate, or rounded. Upper stem leaves similar to lower stem leaves or lanceolate, smaller; uppermost leaves ovate, very small, base cordate to sagittate and clasping, margin entire. Synflorescence corymbose paniculiform, with very numerous capitula. Capitula with usually 10–30 florets. Involucre narrowly cylindric and 0.9–1.3 cm at anthesis, ovoid and ca. 6 mm in diam. in fruit. Phyllaries green to pale yellowish green, glabrous, usually erect in fruit, apex obtuse; outer phyllaries broadly triangular to lanceolate, approaching inner phyllaries in length; inner phyllaries ca. 8. Florets yellow. Achen e body pale brown, narrowly obovoid, ca. 4 mm, compressed, with 5–7 ribs on either side; beak white, filiform, 2–4 mm. Pappus 3–4 mm. Fl. and fr. Feb–Sep. 2n = 18*.

Cultivated throughout China [probably originating from E Mediterranean to SW Asia].

*Lactuca sativa* was first known in cultivation in ancient Egypt. It is widely cultivated as a vegetable in China. Leaves of the species contain Vitamins A, B9, C, and K and can be eaten as a salad. *Lactuca sativa* has many cultivars, which are usually treated as varieties. *Lactuca sativa* var. *angustata* Irish ex Bremer is the most commonly cultivated variety in China, where the thick stems are cooked as a vegetable.


野萵苣 *ye wo ju*

*Lactuca scariola* Fischer & C. A. Meyer; *L. scariola* Linnaeus.

Herbs 50–80 cm tall, annual. Stem solitary, pale, erect, usually branched only apically, glabrous or prickly setose in basal part. Leaves rather rigid, usually held in vertical plane in sunshine, midrib abaxially often prickly setose. Lower and middle stem leaves oblong-lanceolate to narrowly elliptic, 3–7.5 × 1–4.5 cm, pinnatifid, pinnatisect, or more rarely not divided and leaf broadly linear, base auriculately clasping, margin spinulose; lateral lobes usually 3–6 pairs, truncate, falcate, triangular-falcate, or ovate-falcate; terminal lobe triangular-ovate, rhombic, or broadly linear. Uppermost stem leaves smaller, otherwise similar to middle stem leaves or lanceolate, linear-lanceolate, or linear, margin entire. Synflorescence paniculiform and much branched to almost racemiform in meager plants, with numerous capitula. Capitula with 15–25 florets. Involucre narrowly cylindric and 8–10 mm at anthesis, ovoid and ca. 6 mm in diam. in fruit. Phyllaries usually reflexed in fruit, apex acute; outer phyllaries ovate to lanceolate, approaching inner phyllaries in length; inner phyllaries ca. 8. Florets yellow. Achen e body pale brown, narrowly obovoid, ca. 3.5 mm, compressed, with 7–9 ribs on either side; beak whitish, filiform, 3.5–5 mm. Pappus ca. 5 mm, ± caducous. Fl. and fr. Jun–Aug. 2n = 18.
Wastelands, roadsides, gravel areas on floodplains, rock crevices, grasslands on mountain slopes, mountain valleys; 500–2000 m. Taiwan (introduced). Xinjiang [Afghanistan, N India, Kashmir, Kazakhstan, Kyrgyzstan, Mongolia, W Russia, Tajikistan; N and NE Africa, SW Asia, Europe].

Because molecular analyses supported the earlier assumptions on morphological grounds that *Lactuca altaica* cannot be delimited from *L. serriola* they are treated as conspecific.

*Lactuca serriola* was first recorded in Taiwan in 2007 (C. M. Wang & C. H. Chen, Taiwania 55: 331–333. 2010) and seems to be naturalized there. It has also been introduced to S Africa, NE Asia, Australia, North America, Pacific islands (New Zealand), the Russian Far East, and S South America.


栓果菊属 *shuan guo ju shu*

Shi Zhu (石铸 Shih Chu); Norbert Kilian

*Ammoseris* Endlicher; *Brachyramphus* Candolle; *Hexinia* H. L. Yang; *Lomatolepis* Cassini; *Microrhynchus* Lessing; *Paramicrorhynchus* Kirpicznikov; *Rhabdotheca* Cassini.

Herbs, perennial, often rosulate, sometimes acaulescent, (almost) glabrous. Stem erect, ascending-erect, procumbent, or creeping. Leaves undivided and subentire or sinuate-dentate to pinnately dentate. Synflorescence corymbiform or paniculiform, with few to numerous capitula or sometimes capitulum solitary. Capitula with 5–20(–30) florets. Involute cylindric. Phyllaries with indistinct to conspicuous white scarious margin; outer phyllaries in several series, gradually longer centripetally, ± imbricate with longest 1/2–3/4 as long as inner ones; inner phyllaries 5–8, ± equal in length, ± linear-lanceolate. Receptacle naked. Florets yellow. Achene whitish, grayish, blackish, or brownish, homomorphic and all with 5 main ribs or dimorphic and inner with 4 and outer with 5 main ribs, usually accompanied by 2 secondary ribs, smooth or transversely wrinkled, apex truncate to attenuate. Pappus white, of equal faintly scabrid bristles, caducous with pappus disk or persistent.

Fifty-four species: Africa, C, S, and SW Asia; S Europe; four species (one endemic) in China.

1a. Subshrubs; flowering stems hardened, intricately and divaricately branched, erect, with numerous capitula on subulate and after shedding of capitula subsesquised peduncles ................................................................. 2. *L. polydichotoma*

1b. Herbs; flowering stems herbaceous, creeping, procumbent, or erect, if divaricately branched then never intricate and never with subulate later subsesquised peduncle capitula ................................................................. 4. *L. sarmentosa*

2a. Plants with flagelliform branching runners on nodes with small leaf rosettes and solitary pedunculate capitula ................................................................. 3. *L. procumbens*

2b. Plants with procumbent to erect stems or acaulescent.

3a. Phyllaries (especially inner ones) with narrow to inconspicuous white scarious margin; achene 4–7 mm, homomorphic, with 5 main ribs; pappus persistent ................................................................. 1. *L. acaulis*  

3b. Phyllaries (especially outer ones) with broad and conspicuously white scarious margin; achene 2–4 mm, dimorphic, inner ones whitish to grayish with 4 thick main ribs, outer ones brownish to grayish, ± compressed, and with 5 main ribs; pappus caducous with pappus disk ................................................................. 3. *L. procumbens*


光茎栓果菊 *guang jing shuan guo ju*

*Prenanthes acaulis* Roxburgh, Fl. Ind., ed. 1832, 3: 403. 1832; *Crepis acaulis* (Roxburgh) J. D. Hooker; *Lactuca glabra* Candolle; *Launaea glabra* (Candolle) Franchet; *Microrhynchus glaber* Wight; *Youngia acaulis* (Roxburgh) Candolle.

Herbs 10–35 cm tall, perennial, subacaulescent or caulescent, rosulate, glabrous. Rootstock thick, woody, with shoot-bearing roots. Stems few to some, slender, ascending-erect, sparsely branched or simple, leafless or rarely with a few leaves near base. Rosette leaves (sometimes a few extended to basal portion of flowering shoot) spatulate to lanceolate, 5–14 × 0.5–1 cm, base cuneate, margin denticulate and subentire to shallowly sinuate-dentate, apex acute, obtuse, or rounded. Synflorescence sparsely corymbiform, with 1 to a few capitula. Capitula with usually 10–14 florets. Involute cylindric, 1.2–1.5 cm at anthesis, to 1.7 cm in fruit. Phyllaries with narrow or indistinct scarious margin; outer phyllaries triangular-ovate to lanceolate, longest ca. 1/2 as long as inner phyllaries; inner phyllaries 5–9. Achene whitish, homomorphic, columnar, cylindric, or subsesquiform, 4–7 mm, with 5 main ribs, apex truncate. Pappus 6–8 mm, persistent. Fl. and fr. Apr–May. 2n = 18.

Roadsides on mountain slopes, wastelands, sparsely forested steppes; 300–3600 m. Guangxi, Guizhou, Hainan, Sichuan, Yunnan [Bangladesh, Bhutan, India, Kashmir, Laos, Myanmar, Nepal, N Taiwan, N Vietnam].


河西菊 *he xi ju*

*Chondrilla polydichotoma* Ostenfeld in Hedin, S. Tibet 6(3): 29. 1922; *Hexinia polydichotoma* (Ostenfeld) H. L. Yang; *Zollinofera polydichotoma* (Ostenfeld) Iljin.

Herbs 15–50 cm tall, perennial, spheroid. Caudex without residue of fibrous and lacerate sheath, with many stems. Stems erect, hardened to herbaceous, intricately and divaricately branched from base. Lower stem leaves sessile, linear, 0.5–4 × 0.2–0.5 cm, base semiamplexicaul, apex obtuse; leaves higher up on stem reduced and narrowly spatulate to narrowly lan-
ceolate and finally reduced to ovate-acute bracts. Synflorescence divaricately paniculiform, with numerous capitula. Capitula with 5–11 florets; peduncle subulate and after shedding of capitulum hardened and subsessile. Involucre cylindric, 9–12 × 2–3 mm. Phyllaries glabrous, with indistinct scarios margin; outer phyllaries triangular-ovate to lanceolate, longest ca. 3/4 as long as inner phyllaries; inner phyllaries (4 or)5. Achene pale yellow to yellowish brown, homomorphic, cylindric to ob-columnar, 3–5 mm, with 5 main ribs, transversely wrinkled, apex truncate. Pappus 7–10 mm, deciduous. Fl. and fr. May–pale yellow to yellowish brown, homomorphic, cylindric to ob-columnar, 3–5 mm, with 5 main ribs, transversely wrinkled, apex truncate. Pappus 7–10 mm, deciduous. Fl. and fr. May–

- Sandy soils, edges of sandy soils, between sand dunes; 400–2100 m. Gansu, Xinjiang.

Molecular phylogenetic analyses by N. Kilian (unpubl.) corroborate the previous conclusion inferred from achene morphology (N. Kilian, Englera, 17. 1997) that 


Herbs, perennial, rosulate, branched from base, procurrent to ascending. Taproot with shoot-bearing lateral roots. Stems 5–30 cm, divaricately branched, puberulent or glabrous, with few leaves or leafless. Rosette leaves spatulate, 3–8 × 0.6–1 cm, sinuate-dentate to pinnately lobed, attenuate toward base, margin weakly to distinctly denticulate, apex acute, obtuse, or rounded. Terminal lobe lanceolate to elliptic, apex obtuse. Stem leaves smaller, base often clasping, otherwise similar to rosette leaves.


Herbs, perennial, rosulate, creeping, glabrous. Taproot with trailing shoot-bearing lateral roots. Stems several, flagelliform, creeping, 20–90 cm, branched; nodes 4–15 cm apart, with adventitious roots and secondary leaf rosettes. Rosette leaves spatulate, 3–8 × 0.6–1 cm, sinuate-dentate to pinnately lobed, attenuate toward base, margin weakly to distinctly denticulate, apex acute, obtuse, or rounded. Capitulum solitary, terminating secondary leaf rosettes along stems, with usually 14–18 florets; peduncle wiry, 1–3 cm. Involucre cylindric, 1.1–1.4 cm. Phyllaries with distinct white scarious margin, apex acute to obtuse; outer phyllaries triangular-ovate to linear-lanceolate, longest ca. 1/2 as long as inner phyllaries; inner phyllaries 8. Achenes dimorphic, 2–4 mm, apex pointed to subtruncate; outer achenes grayish to brown, ± fusiform, ± compressed, with 5 main ribs, transversely wrinkled; inner achenes whitish to grayish, columnar, with 4 thick, soft main ribs, smooth. Pappus 8–9 mm, caducous with pappus disk. Fl. and fr. Jun.–Oct. 2n = 18.

Open sandy coastal areas just above high tide mark. Guangdong, guangxi, Hainan [India, Indonesia (Java), Myanmar, Sri Lanka, Thailand, Vietnam; E and SE Africa, W Australia].
brownish, ovoid to ellipsoid, compressed, narrowed toward both ends, with (4 or)5 main ribs usually accompanied by 2 secondary ribs, smooth or transversely wrinkled. Pappus white, caducous or persistent, of numerous soft fine outer bristles intermixed with some thicker often ± easily caducous inner bristles.

About 90 species in its wider circumscription: Africa, Asia, Australia, Europe, Pacific islands (New Zealand); five species (two introduced) in China.

The revised, wider circumscription of Sonchus is based on molecular phylogenetic analyses by S. C. Kim et al. (Molec. Phylogen. Evol. 44: 578–597. 2007) and includes several former segregates, which, however, are not present in China.

The main diversity of this genus is in E Africa, the W Mediterranean region, and the mid-Atlantic archipelagos.

1a. Achene distinctly oblanceolate in outline, strongly or distinctly compressed, space between slender ribs much wider than main ribs; annuals (or biennials).
1b. Achene narrowly ellipsoid, moderately to weakly compressed, space between ribs usually narrower than ribs; perennials.

2a. Achene strongly compressed, ± winged, smooth when fully mature; auricles of middle stem leaves rounded and appressed ................................................................. 4. S. asper
2b. Achene distinctly compressed, not winged, distinctly wrinkled when fully mature; auricles of middle stem leaves usually acutely prostrate ........................................................... 5. S. oleraceus

1. Sonchus brachyotus Candolle, Prodr. 7: 186. 1838.

长裂苦苣菜 chang lie ku ju cai

Sonchus arenicola Voroschilov; S. arvensis Linnaeus subsp. arenicola (Voroschilov) Voroschilov; S. arvensis f. brachyotus (Candolle) Kirpicz.; S. arvensis subsp. brachyotus (Candolle) Kitamura; S. brachyotus var. poitainii Tzvelev; S. cavaleriei H. Léveillé; S. chinensis Fischer; S. fauriei H. Léveillé & Vaniot; S. saquetii H. Léveillé.

Herbs 30–100 cm tall, perennial. Taproot with shoot-bearing lateral roots. Stem usually unbranched below synflorescence, glabrous. Basal and lower stem leaves narrowly elliptic to oblanceolate, 5–20 × 1–3(–5) cm, undivided or rarely pinnatifid to pinnatipartite, glabrous, base semiamplexicaul to shortly auriculately clasping, margin denticulate and often sinuate-dentate, apex rounded, obtuse, or subacute; lateral lobes triangular to narrowly triangular if any. Middle and upper stem leaves similar to lower leaves but smaller. Synflorescence corymbose, with few to several capitula. Capitula with very many (usually 170–300) florets; peduncle 0.5–7 cm, slender, glabrous or more rarely white tomentose apically and glabrescent. Involucre broadly campanulate, ca. 1.5 cm, glabrous or more rarely basally faintly white tomentose. Phyllaries mostly glabrous, apex acute; outer phyllaries triangular-ovate to lanceolate, 1.5–3 mm wide. Corolla 1.6–2.6 cm. Achene narrowly ellipsoid, 2–4 mm, subcompressed, with 1–3 main ribs on either face, weakly rugose. Pappus 1.1–1.2 cm, persistent. Fl. and fr. May–Sep. 2n = 18.

Grassy slopes in mountains, by rivers, alkaline areas; 300–4000 m. Fujian, Gansu, Guangdong, Guangxi, Hebei, Heilongjiang, Henan, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shanxi, Shandong, Sichuan, Xinjiang, Xizang, Yunnan, Zhejiang [Japan, Kazakhstan, Kyrgyzstan, Mongolia, SE Russia, Thailand].

The diploids Sonchus brachyotus and S. wightianus together with the diploid Mediterranean and SW to C Asian S. maritimus Linnaeus and the chiefly European polyploid S. arvensis Linnaeus (see also note under S. wightianus) form a group of closely related species. Identity and delimitation of S. brachyotus, S. wightianus, and S. arvensis (incl. S. alpinus) has long been misunderstood, before Boulou (Bot. Not. 126: 155–196. 1973) clarified their taxonomy. Due to the confusion in the past, the distribution of S. brachyotus in China is probably still incompletely known. Two conceptual problems surrounded this species. 1) The name S. transcaspicus Nevski was applied (e.g., FRPS 80(1): 66. 1997) for plants of this group with glabrous, non-glandular involucres and undivided leaves, and that species was considered as widely distributed in China, except for the southeast. Sonchus transcaspicus, however, is a name coined for C Asian populations of S. maritimus (see, e.g., Kirpicz.; Fl. URSS 29: 244–260. 1964). The alleged minor differences in leaf shape are not consistent and do not justify the recognition of two taxonomic entities, as has been concluded already by Boulou (loc. cit.) and more recently confirmed by Sennikov (Bot. Zhurn. 85(12): 90–94. 2000). The easternmost occurrences of S. maritimus/S. transcaspicus are in Tajikistan and Kyrgyzstan (according to Sennikov, loc. cit.) or, more likely, even further west in E Turkmenistan (Boulou, loc. cit.; Tzvelev, Rast. Tsentral. Azii 14b: 77. 2008). The species is also not given in the treatment of Sonchus for the immediately adjacent Chinese province of Xinjiang (C. H. An, Fl. Xinjiang. 5: 434–438. 1999). Sonchus transcaspicus sensu FRPS (80(1): 66. 1997) instead refers to the frequent undivided-leafy form of S. brachyotus. The latter species, like S. arvensis and in contrast to S. maritimus, does not actually have a rhizome, although often stated in the literature, but has lateral roots that produce new shoots even after the root system has been fragmented. Moreover, S. maritimus/S. transcaspicus is a species with glaucous leaves, smaller capitula with 80–150 florets, a corolla with the tube much shorter than the ligule, achene of 2–3 mm only, and...

Herbs to 1.8 m tall, perennial. Rhizome short, 4–5 cm thick. Stems stout, base ca. 3 cm in diam., branched apically. Lower stem leaves sessile, oblanceolate to lanceolate, 15–35 × 5–20 cm, undivided to pinnatipartite, glabrous, base sagittately clasping, margin denticulate, apex acuminate; lateral lobes if present 1–3 pairs, lanceolate, apex acute; terminal lobe triangular to triangular-lanceolate. Middle and upper stem leaves lanceolate; uppermost stem leaves reduced, linear-lanceolate to linear. Synflorescence corymbiform to panicularly corymbiform, with many capitula. Capitula with many (usually 70–90) florets; peduncle slender, densely glandular hairy. Involucre campanulate, to 1.5 cm. Phyllaries abaxially glandular hairy, apex acutae to acuminate; outer phyllaries linear-lanceolate, 1–2 mm wide; inner phyllaries linear-lanceolate. Corolla ca. 1.2 cm. Achenes narrowly ellipsoidal, ca. 4 mm, weakly compressed, ± quadrangular in cross section, weakly rugose, between lateral ribs usually with 1 very strongly prominent main rib and several secondary ribs on either face. Pappus 7–8 mm, caducous ± as a unit. Fl. and fr. Jun–Sep. 2n = 18.

By water and lakes; 400–900 m. Xinjiang [Kazakhstan, Kyrgyzstan, W Russia, Tajikistan, Turkmennistan, Uzbekistan, Europe].


Herbs 20–50 cm tall, annual. Stem usually unbranched and glabrous below synflorescence. Basal and lower stem leaves extremely variable, obovate, spatulate, or elliptic, 7–13 × 2–5 cm, undivided or ± irregularly pinnatisect, glabrous, adaxially dark green and ± glossy, base attenuate and ± auriculate, margin usually densely spinulosely dentate, apex acute, acuminate, or obtuse; lateral lobes ± triangular, semiorbiculcar, or elliptic. Middle and upper stem leaves spatulate to lanceolate, base auriculately clasping with conspicuous rounded and appressed auricles, otherwise similar to lower leaves. Synflorescence densely corymbiform, with few to some capitula. Capitula with many florets; peduncle 0.5–5 cm, slender, glabrous or densely glandular hairy. Involucre ± campanulate, ca. 1.2 cm. Phyllaries abaxially glabrous or more rarely glandular hairy, apex acutae to acuminate; outer phyllaries linear-lanceolate, 1–2 mm wide; inner phyllaries linear-lanceolate. Corolla ca. 1.2 cm. Achenes narrowly ellipsoidal, ca. 4 mm, weakly compressed, ± quadrangular in cross section, weakly rugose, between lateral ribs usually with 1 very strongly prominent main rib and several secondary ribs on either face. Pappus 7–8 mm, caducous ± as a unit. Fl. and fr. Jun–Sep. 2n = 18.

By water and lakes; 400–900 m. Xinjiang [Kazakhstan, Kyrgyzstan, W Russia, Tajikistan, Turkmennistan, Uzbekistan, Europe].


Herbs 20–50 cm tall, annual. Stem usually unbranched and glabrous below synflorescence. Basal and lower stem leaves extremely variable, obovate, spatulate, or elliptic, 7–13 × 2–5 cm, undivided or ± irregularly pinnatisect, glabrous, adaxially dark green and ± glossy, base attenuate and ± auriculate, margin usually densely spinulosely dentate, apex acute, acuminate, or obtuse; lateral lobes ± triangular, semiorbiculcar, or elliptic. Middle and upper stem leaves spatulate to lanceolate, base auriculately clasping with conspicuous rounded and appressed auricles, otherwise similar to lower leaves. Synflorescence densely corymbiform, with few to some capitula. Capitula with many florets; peduncle 0.5–5 cm, slender, glabrous or densely glandular hairy. Involucre ± campanulate, ca. 1.2 cm. Phyllaries abaxially glabrous or more rarely glandular hairy, apex acutae to acuminate; outer phyllaries linear-lanceolate, 1–2 mm wide; inner phyllaries linear-lanceolate. Corolla ca. 1.2 cm. Achenes narrowly ellipsoidal, ca. 4 mm, weakly compressed, ± quadrangular in cross section, weakly rugose, between lateral ribs usually with 1 very strongly prominent main rib and several secondary ribs on either face. Pappus 7–8 mm, caducous ± as a unit. Fl. and fr. Jun–Sep. 2n = 18.
Mountain slopes, forest margins, by water, field margins, ruderal areas; 1500–3700 m. Naturalized in Guangxi, Hubei, Jiangsu, Shandong, Sichuan, Taiwan, Xinjiang, Xizang, and Zhejiang [presumably originating from Europe and Mediterranean region].

Sonchus asper is naturalized in areas adjacent to China including Afghanistan, Bhutan, India, Japan, Kashmir, Kazakhstan, Korea, Kyrgyzstan, Nepal, Pakistan, Russia, Tajikistan, Thailand, Turkmenistan, Uzbekistan, and Vietnam. The species is also naturalized in sub-Saharan Africa, Asia, Australia, New Guinea, North and South America, and Pacific islands (New Zealand).


苦苣菜 ku ju cai

Sonchus ciliatus Lamarck; S. mairei H. Léveillé (1913), not H. Léveillé (1915).

Herbs 40–150 cm tall, annual or sometimes biennial. Stem below synflorescence simple or branched, glabrous. Basal and lower stem leaves with basal portion petiole-like and attenuate, mostly smaller than middle stem leaves, otherwise similar. Middle and upper stem leaves extremely variable, elliptic, oblanceolate, or lanceolate, 6–20 × 2–9 cm, almost entire to ± irregularly pinnatisect, soft, glabrous, adaxially dull green, base auriculately clasping with auricles usually acutely prostrate, margin ± coarsely spinulosely dentate, apex acute; lateral lobes triangular to elliptic, usually recurved, apex acute to acuminate; terminal lobe larger than others, broadly triangular, broadly hastate, or obovate-cordate. Synflorescence shortly corymbiform or racemiform, with few to several capitula. Capitula with many florets; peduncle 0.5–3(–5) cm, slender, glabrous, glandular hairy, or apically white tomentose. Involucre ± campanulate, 1–1.2 cm. Phyllaries glabrous or with few glandular hairs, apex ± obtuse; outer phyllaries triangular to narrowly lanceolate, 1–3 mm wide. Corolla 1–2 cm. Achenes oblong-cylindrical, 2.5–4 mm, distinctly compressed, between lateral ribs with 3(–5) slender ribs on either side, space between slender ribs much wider than ribs, distinctly rugose when fully mature. Pappus 6–8 mm, ± persistent, Fl. and fr. May–Dec. 2n = 32.

Mountain slopes, forests, forest margins, fields, near water, open land, ruderal areas; 1700–3200 m. Naturalized in Anhui, Fujian, Gansu, Guangxi, Guizhou, Hainan, Hebei, Henan, Hunan, Jiangsu, Jiangxi, Liaoning, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, and Zhejiang [presumably originating from Europe and Mediterranean region].

Sonchus oleraceus is naturalized in all countries neighboring China and is anthropogenically distributed almost worldwide.

The entire plants are used medicinally.

64. CHONDILLA Linnaeus, Sp. Pl. 2: 796. 1753.

粉苞菊属 fen bao ju shu

Shi Zhu (石铸 Shih Chu); Norbert Kilian

Herbs, perennial [or rarely annual], with or without basal leaf rosette, often broomlike, glabrous or with simple bristles, arachnoid hairy, or tomentose. Synflorescence of individual axes in broomlike plants sparsely racemiform or with a single terminal capitulum. Capitula with usually 5–12 florets. Involucre narrowly cylindric. Phyllaries glabrous, arachnoid hairy, or with simple bristles; outer phyllaries few, only slightly longer centripetally, longest ca. 1/4 as long as inner ones; inner phyllaries 5(–7) or ca. 8, ± equal in length, ± linear-lanceolate. Receptacle naked. Florets yellow. Achenes subcylindrical, somewhat narrowed toward base, with 5 main ribs, each rib usually divided into 3 secondary ribs, apically or from middle with tubercles or scales, apically usually with a corona of 5 entire or 3-lobed ± membranous scales; beak usually present, short and stout to longer and filiform, when fully mature with or without fine transverse articulation preforming rupture of beak. Pappus white, simple, of scabrid bristles.

About 30 species: mostly in C and SW Asia and the Mediterranean region; ten species in China.

The noxious weed Chondrella juncea Linnaeus has been introduced to Australia, North and South America, and Pacific islands (New Zealand) but has not yet been reported from China.

1a. Capitula with 5 or 6 florets; inner phyllaries 5(–7).
2a. Achenes with a conspicuous 0.5–1.5 mm beak, body with well-developed apical corona of scales .......................... 9. C. pauciflora
2b. Achenes shortly attenuate into a rudimentary stout beak of 0.1–0.3 mm, body without apical corona of scales or corona at most indistinct ................................................................................................................ 10. C. ambiguca

1b. Capitula with 9–12 florets; inner phyllaries ca. 8.
3a. Beak of mature achene without fine transverse articulation preforming rupture of beak; plants rosulate but rosette leaves withered at anthesis.
4a. Stem leaves linear-lanceolate to linear, to 0.6 cm wide, subglabrous; stem and branches glabrous; achene body with corona of 5 variably shaped entire to weakly 3-lobed scales to 0.5 mm ......................... 1. C. brevirostris
4b. Stem leaves lanceolate to broadly ovate, 1–3 cm wide, pubescent; stem and branches arachnoid pubescent to tomentose; achene body with corona of 5 linear-lanceolate, entire to sometimes 3-lobed, and acute scales to 1 mm ....................................................................................................................... 2. C. aspera

3b. Beak of mature achene with fine transverse articulation preforming rupture of beak; plants never rosulate.
5a. Achene beak articulation approximately in its middle; inner phyllaries dark green or blackish, bristles blackish if present.
6a. Achene body below corona smooth or with isolated tubercles, beak constricted at articulation .... 3. C. pauciflora
6b. Achene body below corona with few scales, beak not constricted at articulation ................................. 4. C. ornata
5b. Achene beak articulation distinctly below its middle, near its base, or below or slightly above upper edge of corona; inner phyllaries green, light green, or grayish green, bristles pale if present.

7a. Corona scales of achene of approximately quadrangular shape, upper margin weakly 3-lobed or entire.

8a. Achene body below corona usually without scales or more rarely with few very small toothlike scales, beak 0.8–1.5 mm ..........................................................  5. C. piptocoma

8b. Achene body below corona with few rows of conspicuous quadrangular scales similar to corona scales, beak 1–2.5 mm ..........................................................  6. C. laticoronata

7b. Corona scales of achene distinctly triangular and undivided or deeply divided with distinctly triangular lobes.

9a. Corona scales of achene deeply and ± equally to very unequally (with dominating middle lobe) 3-lobed; achene body below corona with few rows of tubercles and narrow scales; beak 1.3–3(–4) mm, articulation below its middle and above upper edge of corona terminating basal conical portion ..........................................................  7. C. leiosperma

9b. Corona scales of achene undivided and narrowly triangular; achene body below corona with few rows of short and wide scales; beak 1.2–2.3 mm, articulation at its base near upper edge of corona ..........................................................  8. C. rouillieri


短喙粉苞菊 duan hui fen bao ju

Herbs 30–60 cm tall, perennial, rosulate, becoming broom-like. Stem strongly erect-spreadingly branched from base, basically somewhat setaceous otherwise glabrous, branches slender, virgate. Rosette leaves spatulate to elliptic, 7–11 × 0.5–1.5 cm, withered at anthesis, runcinately pinnate, glabrous or abaxially with sparse rigid hairs. Lower and middle stem leaves lanceolate to linear, 2–11 cm × 1–5 mm, weakly but ± sharply incised or entire, glabrous or abaxially with sparse rigid hairs. Capitula with usually 9–12 florets. Involucre 1–1.2 cm, arachnoid hairy, occasionally with very few bristles. Phyllaries grayish-green; outer phyllaries broadly triangular-ovate, longest ca. 2 mm; inner phyllaries 8. Achene body 4–5 mm, with a corona of 5 variably shaped entire to weakly 3-lobed erect scales of 0.2–0.5 mm, below corona with 1 to few rows of short rounded scales; beak 0.5–2.5 mm, without articulation. Pappus 6–9 mm. Fl. and fr. Jun–Sep.

Desert steppes, grasslands in forests; ca. 1300 m. Xinjiang [Kazakhstan, Kyrgyzstan, Russia (W Asian and E and S European parts)].


硬叶粉苞菊 ying ye fen bao ju

Prenanthes aspera Schrader ex Willdenow, Sp. Pl. 3: 1539. Dec 1803, not Michaux (Mar 1803); Chondrilla stricta Ledebour; Youngia aspera (Poiret) Steudel.

Herbs 30–70 cm tall, perennial, broom-like. Stem basally erect-spreadingly and higher up divaricately branched; branches slender, glabrous or arachnoid hairy, ± leafy. Lower stem leaves narrowly elliptic, 4–4.5 × 0.2–1 cm, early deciduous, margin subentire to weakly runcinately dentate. Middle and upper stem leaves linear-elliptic, linear, or subfiliform, 2–4 cm × 0.5–1.5 mm, margin entire. Capitula with usually 10–12 florets. Involucre 1.1–1.2 cm, arachnoid hairy and with or without blackish bristles. Phyllaries dark green to blackish; outer phyllaries triangular-ovate to lanceolate, longest ca. 2.5 mm; inner phyllaries 8, abaxially with or without long bristles along midvein. Achene body 3–5 mm, with a corona of 5 short unlobed to ± 3-lobed (middle lobe longest) erect scales of ca. 0.2 mm, below corona smooth or with isolated tubercles, sometimes corona inconspicuous or absent; beak stout, 0.8–2.3 mm, constricted and with distinct fine articulation approximately in its middle. Pappus 6–7 mm. Fl. and fr. Jun–Sep.


暗粉苞菊 an fen bao ju

Chondrilla maracandica Bunge.

Herbs 30–70 cm tall, perennial, broom-like. Stem basally erect-spreadingly and higher up divaricately branched; branches slender, glabrous or arachnoid hairy, ± leafy. Lower stem leaves narrowly elliptic, 4–4.5 × 0.2–1 cm, early deciduous, margin subentire to weakly runcinately dentate. Middle and upper stem leaves linear-elliptic, linear, or subfiliform, 2–4 cm × 0.5–1.5 mm, margin entire. Capitula with usually 10–12 florets. Involucre 1.1–1.2 cm, arachnoid hairy and with or without blackish bristles. Phyllaries dark green to blackish; outer phyllaries triangular-ovate to lanceolate, longest ca. 2.5 mm; inner phyllaries 8, abaxially with or without long bristles along midvein. Achene body 3–5 mm, with a corona of 5 short unlobed to ± 3-lobed (middle lobe longest) erect scales of ca. 0.2 mm, below corona smooth or with isolated tubercles, sometimes corona inconspicuous or absent; beak stout, 0.8–2.3 mm, constricted and with distinct fine articulation approximately in its middle. Pappus 6–7 mm. Fl. and fr. Jun–Sep.
Gravelly areas in deserts; 900–4000 m. Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].

Chondrilla maracandica, treated as a species of the flora of Xinjiang by C. H. An (Fl. Xinjiang. 5: 430. 1999; see also Leonova, Fl. URSS 29: 578. 1964; Tzvelev, Rast. Tsentr. Azii 14b: 84. 2008), appears not convincingly distinct from C. phaeocephala and is here tentatively considered as conspecific.


Chondrilla ornata Iljin; C. soongarica (Stscheglejew)

Herbs 40–70 cm, perennial, broomlike. Stem strongly branched from base, basally arachnoid hairy; branches yellowish green, slender, virgate, glabrous, ± leafy. Lower stem leaves narrowly elliptic to linear, early deciduous, abaxially with bristles on midrib and at margin, margin denticulate. Middle and upper stem leaves filiform, 1–3 cm × ca. 1 mm, glabrous, margin entire. Capitula with ca. 11 florets. Involucre ca. 1.1 cm, scattered arachnoid hairy. Phyllaries dark green; outer phyllaries triangular-ovate, longest ca. 1.5 mm; inner phyllaries 8. Achene body 3–5 mm, with ± quadrangular corona scales; beak stout, 0.5–1 mm, with fine articulation approximately in its middle. Pappus 5–7 mm. Fl. and fr. Jul–Sep. 2n = 20.

Rocky gravelly slopes; 400–1000 m. Xinjiang [Kyrgyzstan].

No material of Chondrilla ornata has been seen by the present authors. The description is based on Iljin (loc. cit.), Leonova (Fl. URSS 29: 579. 1964), and C. H. An (Fl. Xinjiang. 5: 429. 1999).


Kuan guan fen bao ju

Chondrilla piptocoma subsp. soongarica (Stscheglejew)

Iljin; C. soongarica Stscheglejew

Herbs 35–120 cm tall, perennial, ± broomlike. Stem basally erect-spreadingly and higher up divaricately branched; branches slender, densely arachnoid hairy to more rarely ± glabrous, ± leafy. Lower stem leaves narrowly oblanceolate, 3.5–7 cm × ca. 4 mm, early deciduous, margin runcinately pinnate or sparsely dentate. Middle and upper stem leaves linear to filiform, 4–6 cm × 0.5–1 mm, glabrous or arachnoid hairy, margin entire. Capitulum with 9–12 florets. Involucre 1–1.3 cm, ± densely arachnoid hairy. Phyllaries greyish to light green; outer phyllaries narrowly triangular-ovate, longest ca. 2 mm; inner phyllaries 8. Achene body 3–5 mm, with ± quadrangular corona scales with margin weakly 3-lobed or entire, below corona without scales or with few very small toothlike scales; beak 0.8–1.5 mm, with fine articulation near its base below or slightly above upper edge of corona. Pappus 6–8 cm. Fl. and fr. May–Sep. 2n = 10.

Gravelly areas on floodplains; 600–3300 m. Xinjiang [Kazakhstan, SC Russia].

According to Iljin (Bjull. Otdel. Kaučuk. 3: 36. 1930) and Leonova (Fl. URSS 29: 574. 1964) the achene body below the corona in Chondrilla piptocoma is without or with few scales only. Chinese material with rather well-developed scales below the corona but with a short, stout beak approaches and has been treated as C. laticornata (see also FRPS 80(1): 296. 1997), necessitating a reassessment of the delimitation between both species.


宽冠粉苞菊 kuan guan fen bao ju

Herbs 20–60 cm tall, perennial, ± broomlike. Stem erect-spreadingly branched from base, basally usually densely arachnoid hairy and sometimes with sparse rigid hairs; branches light green, slender, ± leafy. Leaves glabrous or with arachnoid hairs. Lower stem leaves narrowly lanceolate, ca. 3 cm × 3–7 mm, early deciduous, margin entire or weakly dentate. Middle and upper stem leaves linear, narrowly linear, or almost filiform, 1.5–2.5(–5) cm × 0.5–2 mm, margin entire. Capitula with 9–11 florets. Involucre 1–1.3 cm, ± white tomentose. Phyllaries whitish grayish green; outer phyllaries narrowly triangular-ovate, longest ca. 2 mm; inner phyllaries 8, sometimes with a few pale bristles on midvein. Achene body 3.5–4.5 mm, with approximately quadrangular corona scales with truncate and entire to somewhat erose margin, below corona with few rows of conspicuous quadrangular scales similar to corona scales; beak 1–2.5 mm, with fine articulation near its base below or slightly above upper edge of corona. Pappus white, 6–7 mm. Fl. and fr. Jul–Sep.

Gravelly areas; 1000–2200 m. Xinjiang [Kazakhstan, SC Russia].

The delimitation between Chondrilla laticornata and C. piptocoma should be reassessed. See note under the latter species, above.


北疆粉苞菊 bei jiang fen bao ju

Chondrilla articulata L. E. Rodin; C. brevicollis Iljin; C. coronifera Iljin.

Herbs 30–120 cm tall, perennial, ± broomlike. Stem erect-spreadingly branched at base, basally ± densely arachnoid hairy, sometimes with few rigid hairs; branches slender, rather sparsely branched, glabrous or pubescent, ± leafy. Lower stem leaves narrowly elliptic to lanceolate, 3–10 × 0.4–1.2 cm, early deciduous, glabrous or arachnoid hairy, margin dentate to weakly ± runcinately pinnate to more rarely almost entire. Middle and upper stem leaves narrowly elliptic, narrowly lanceolate, or linear, 1–5(–7) cm × 1–2 mm, glabrous or with arachnoid hairs, margin entire. Capitula with 9–11 florets. Involucre 1–1.3 cm, arachnoid hairy. Phyllaries greyish green; outer phyllaries triangular-ovate, longest ca. 3 mm; inner phyllaries 8, abaxially sometimes with pale bristles on midvein. Achene body 3–5 mm, with corona scales deeply and ± equally to very unequally 3-lobed with middle lobe then dominating, below corona with few rows of tubercles and narrow scales; beak 1.3–3(–4) mm, with fine articulation below its middle and above upper edge of corona terminating basal conical portion. Pappus 5–8 mm. Fl. and fr. May–Sep. 2n = 15.

Mountain slopes; 200–1500 m. Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan, Uzbekistan].

基叶粉苞菊  ji ye fen bao ju

Herbs 40–90 cm tall, perennial. Stem erect, branched particularly higher up or more rarely from base, basally usually arachnoid hairy and with sparse rigid hairs or more rarely glabrous; branches slender, virgate, glabrous or sometimes apically sparsely arachnoid hairy. Lower stem leaves narrowly elliptic to narrowly lanceolate, 4–6 × 0.3–0.6 cm, early deciduous, with bristles on margin and abaxially on midvein, margin remotely dentate. Middle and upper stem leaves linear to almost filiform, 0.5–5 × 0.1–0.4(–0.6) cm, glabrous, margin entire. Capitula with 9–11 florets. Involucr e 1–1.3 cm, densely arachnoid hairy. Phyllaries grayish green to light green; outer phyllaries ± imbricate, centripetally gradually developed corona. Pappus white to pale yellowish, soft to developed corona. Fl. and fr. May–Sep. 2n = 15.

Gravelly areas in river valleys, sandy soil, forests; 700–900 m. Xinjiang [Kazakhstan, SC Russia].


少花粉苞菊  shao hua fen bao ju

*Chondrilla kossinskyyi* Iljin; *C. saisianensis* Iljin; *C. squamata* Iljin; *C. thoracifera* Iljin.

Herbs 40–110 cm tall, perennial, broomlike, basally sometimes woody. Stem ± intricately basally erect-spreadingly and higher up divaricately branched; branches slender, glabrous, ± leafy. Lower stem leaves lanceolate, 2.5–3.5 × 0.2–0.6 cm, early deciduous, glabrous, margin entire. Middle and upper stem leaves narrowly lanceolate to linear, 1–3 cm × 0.3–1.5 mm, early deciduous, glabrous, margin entire. Capitula with 5(–7) florets. Involucr e 1.2–1.4 cm, glabrous or sparsely arachnoid hairy especially basally. Phyllaries green to dark green; outer phyllaries broadly triangular-ovate, 1–2 mm; inner phyllaries 5(–7). Achene 5–7.5 mm; body apically with a corona of 5 erect 3-lobed to irregularly lobed scales of (0.1–)0.2–0.3 mm with lobes of ± equal length, below with 1 or 2 series of tubercles and/or scales; beak stout, 0.5–1.5(–2) mm, without articulation. Pappus 7–9 mm. Fl. and fr. May–Sep. 2n = 15.

Gravel steppes; 500–1500 m. Xinjiang [Kazakhstan, Russia (E European part), Uzbekistan].

C. H. An (Fl. Xinjiang, 5: 433. 1999) also includes for Xinjiang *Chondrilla macrocarpa* Leonova, a species otherwise only known from Kyzyl Kum and distinguished from *C. ambigu a* by its achene with a body of up to 1.1 cm. The corresponding material has not been seen by the authors, but from the distribution this report appears very questionable (see also Tzvelev, Rast. Tsentral. Azii 14b: 86. 2008); also, from the description given by C. H. An it seems that a confusion probably exists with material of *C. pauciflora*, perhaps with rather indistinctly developed corona.


沙地粉苞菊  sha di fen bao ju

Herbs 40–100 cm tall, perennial, broomlike, basally sometimes woody. Stem basally erect-spreadingly and higher up densely and intricately divaricately branched; branches slender, glabrous, ± leafy. Lower stem leaves linear-lanceolate to lanceolate, 3–7 × 0.2–0.5 cm, early deciduous, glabrous, margin entire or sometimes very scarcely dentate, apex acute. Middle and upper stem leaves linear-lanceolate to filiform, usually shorter and only 1.5 mm wide, otherwise like lower stem leaves. Capitula with ca. 5 florets. Involucr e 1.2–1.4 cm, glabrous or sparsely arachnoid hairy especially basally. Phyllaries green to yellowish green; outer phyllaries broadly triangular-ovate, 1–2 mm; inner phyllaries 5. Achene cylindrical, 5–7 mm, without or very faintly with scales or tubercles, without apical corona of scales, apically shortly attenuate into a rudimentary stout beak of 0.1–0.3 mm without articulation. Pappus 6–8 mm. Fl. and fr. May–Sep. 2n = 10.

Sand dunes, gravel and loess areas; 300–800 m. Xinjiang [Kazakhstan, Russia (E European part), Turkmenistan, Uzbekistan].

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还阳参属  huan yang shen shu

Shi Zhu 石铸 Shih Chu); Norbert Kilian

*Barkhausia* Moench; *Berinia* Brignoli; *Hieracioides* Vaillant; *Lepicaune* Lapeyrouse; *Soyeria* Monnier.

Herbs, perennial, biennial, or annual, rhizomatous or with a taproot. Stems leafy or leafless. Leaves pinnate or not divided, margin entire or toothed. Synflorescence corymbose, paniculiform, or racemiform, rarely a solitary capitulum. Capitula erect, medium to large in size. Involucr e cylindric to campanulate. Phyllaries in several series; outer phyllaries ± imbricate, centripetally gradually longer, longest 1.4–2.3 cm or more as long as inner ones; inner phyllaries usually equal in length, linear-lanceolate, abaxially usually with simple and/or glandular hairs, rarely glabrous, adaxially glabrous or with appressed silky hairs. Receptacle naked [or more rarely paleate or with bristles]. Florets yellow [or more rarely reddish purple]. Achene cylindric to fusiform, with 10–20 equal finely spinulose or smooth and glabrous ribs, apex distinctly attenuate, constricted, or beaked. Pappus white to pale yellowish, soft to rigidulous, scabrid, persistent or caducous.

About 200 species: Africa, Asia, Europe, North America; 18 species (five endemic) in China.

1a. Plants with a horizontal, vertical, or oblique rhizome.

2a. Leaf blade of at least some leaves pinnately lobed, otherwise stem leafless; stem leafless or leafy.
3a. Stem leafless or almost so.
   4a. Phyllaries abaxially densely with white arachnoid hairs, and stiff, greenish, glandular hairs along
       midvein; anther tube 1–2 mm ............................................................  1. C. multicaulis
   4b. Phyllaries abaxially sparsely with white arachnoid hairs, and with blackish glandular hairs along
       midvein; anther tube 2–3 mm .............................................................  2. C. elongata

3b. Stem leafy with leaves ± clasping stem.
   5a. Involucre 7–9 mm, abaxially with short blackish glandular hairs and often with setaceous simple
       hairs; achene 3.5–4 mm .................................................................  3. C. lyrate
   5b. Involucre 10–13 mm, abaxially glabrous or sparsely white hairy (especially at apex) or with black
       long simple hairs on midvein; achene 4–6 mm ..................................  6. C. coreana

2b. Leaf blade not divided and stem always leafy.
   6a. Involucre 1.4–1.6 cm or longer.
      7a. Stem especially apically with white arachnoid and with stiff subulate greenish hairs; leaf blade
          margin irregularly and coarsely toothed; involucre abaxially densely with pale stiff subulate
          hairs especially on midvein .....................................................  5. C. sibirica
      7b. Stem sparsely apically arachnoid hairy and densely so under capitula, also with long dark green
          to blackish hairs; leaf blade margin subentire; involucre abaxially white arachnoid hairy and
          with dark green to blackish long hairs ........................................  9. C. chrysanthina
   6b. Involucre 0.8–1.3 cm.
      8a. Involucre 1–1.3 cm, abaxially glabrous to sparsely white hairy (especially at apex) or with black
          long simple hairs on midvein ....................................................  6. C. coreana
      8b. Involucre 0.8–1 cm, abaxially with stipitate blackish glandular hairs on midvein .......................  17. C. shihii

1b. Plants without rhizomes but with a taproot.
   9a. Synflorescence racemiform to very narrowly paniculiform with some to numerous capitula ...............  14. C. napifera
   9b. Synflorescence of a solitary capitulum or corymbiform and of 2 to numerous capitula. .................  2a. Inner phyllaries adaxially appressed hairy (as seen with a lens).
      10a. Plants with well-developed stems, 20–60 cm tall.
       11a. Involucre 0.9–1.1 cm; phyllaries abaxially with ± white arachnoid hairs and especially along
            midvein with thicker yellowish glandular or partly non-glandular hairs ..................................  8. C. crocea
       11b. Involucre 0.9–1.1 cm; phyllaries abaxially with white arachnoid hairs along midvein but
            without thicker yellow hairs .......................................................  7. C. oreades
       11c. Involucre 0.9–1.1 cm; phyllaries abaxially with ± white arachnoid hairs and especially along
            midvein with thicker yellowish glandular or partly non-glandular hairs .............................. 13. C. lignea

10b. Inner phyllaries adaxially glabrous (as seen with a lens).
   13a. Plants only with well-developed basal leaves or with basal leaves and lower stem leaves well
        developed and these larger than upper stem leaves, largest leaves obovateolate to elliptic
        and 2–5 cm wide.
      14a. Plants subacaulis, 3–5 cm tall ......................................................  18. C. tianshanica
      14b. Plants with well-developed stems, 20–60 cm tall.
       15a. Stems leafless or almost so with stem leaves (if present) much reduced and not
            clasping stem ........................................................................  15. C. subscaiosa
       15b. Stems with well-developed leaves clasping stem .............................................  16. C. darvazica
   13b. Basal leaves or lower stem leaves reduced, linear-subulate, triangular, or bractlike, middle
        and upper stem leaves well developed, largest stem leaves lanceolate to linear and 1–25 mm wide.
      16a. Middle and upper stem leaves lanceolate, elliptic, or narrowly elliptic-lanceolate, 0.3–2.5 cm
           wide ......................................................................................... 10. C. phoenix
      16b. Middle and upper stem leaves linear, 1–10 mm wide.
       17a. Leaf blade soft in texture, dark green; stems smooth and dark green; capitula with
            18–30 florets .............................................................................  11. C. bodinieri
       17b. Leaf blade rigid in texture, usually pale yellowish green; stems angular and pale
            green; capitula with 7–12 florets (only exceptionally more).
       18a. Plants sparsely to moderately and divaricately branched from base, above
            middle, or at apex; stem leaves to 8 cm ......................................  12. C. rigescens
       18b. Plants strongly and fastigiately branched from base or below middle; stem
            leaves to 3 cm .........................................................................  13. C. lignea

1. **Crepis multicaulis** Ledebour, Icon. Pl. 1: 9. 1829.
   2. **Aracium multicaule** (Ledebour) D. Dietrich; **Crepis multicaulis** subsp. **congesta** (Regel & Herder) Babcock; **C. multicaulis** var. **congesta** Regel & Herder; **C. multicaulis** var. **laxa**
Regel & Herder; C. multicaulis subsp. subintegrifolia Tolmatchew & Rebrkikova; C. stoliczkae C. B. Clarke.

Herbs 8–60 cm tall, perennial, with a short ± oblique rhizome, rosulate. Stems few to numerous, rarely solitary, rather slender, erect or curved-ascending, branched apically, glabrous or basally with sparse arachnoid hairs, usually ± leafless. Rosette leaves narrowly elliptic-lanceolate, ovate-oblancoate, elliptic, or spatulate, 3.5–11 × 0.7–2 cm, undivided or pinnatifid to pinnatisect, both surfaces short white pubescent, base attenuate into a petiole-like portion, margin entire or sinuate-dentate, apex acute, obtuse, or rounded; lateral lobes (if present) triangular, narrowly triangular, or elliptic, gradually smaller toward leaf base, apex obtuse to acute. Stem leaves 0–2, much reduced in size, linear, margin entire. Synflorescence paniculate or corymbosely so, with few to several capitula. Capitula with 30–40 florets; peduncle slender, often curved-erect, with dense white arachnoid hairs and stiff greenish glandular hairs. Involucrue cylindric, 7–9 × 3–5 mm. Outer phyllaries triangular-ovate to lanceolate, longest to 3 mm, apex acute to obtuse; inner phyllaries 8–10, abaxially with white arachnoid hairs and stiff greenish glandular hairs along midvein, axially glabrous, margin scarious, apex acute to obtuse. Anther tube 1–2 mm. Achene reddish brown, fusiform, straight or subcurved, ca. 4 mm, with 10–12 ribs. Pappus white, ca. 4 mm. Fl. and fr. May–Aug. 2n = 10.

Forests, forest margins, open places in forests, grasslands, gravelly areas by streams and water, floodplains; 1600–3600 m. Xinjiang [Kashmir, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, C and SW Russia, Tajikistan; SW Asia; N Europe].

Crepis multicaulis and C. elongata are closely related, and their delimitation needs reassessment.


琴叶还阳参 qin ye huan yang shen

Crepis tibetica Babcock.

Herbs, perennial, with a horizontal or oblique rhizome. Stem solitary to few, 25–65 cm tall, erect, unbranched or moderately branched from basal third or higher up, with conspicuously erect and usually rather long branches, apically ± densely with blackish long glandular hairs. Leaves mostly basal, rosulate to crowded, ovalsphoate to elliptic, (3–)5–16 (–22) × 0.8–2.2 cm including a winged petiole 1/3–1/2 rest of leaf, both faces with long yellowish hairs, base cuneate-attenuate to abruptly narrowed, margin sinuate-dentate to pinnatifid with triangular segments, apex obtuse to rounded. Stem leaves 0–2, similar to basal leaves or bractlike and reduced, ± linear, margin entire. Synflorescence corymbiform to paniculately corymbiform, with (1–)3–12 capitula. Capitula with 30–40 florets; peduncle slender, 0.5–5 cm, sparsely to more densely white tomentose and with ± dense blackish glandular hairs. Involucrue green to dark green, cylindric to campanulate, 7–9 × 4–8 mm. Phyllaries abaxially with short blackish glandular and often with setaceous simple hairs; outer phyllaries linear, longest 1/4–1/2 as long as inner ones, apex acute; inner phyllaries adaxially glabrous, apex acute. Anther tube ca. 3.5 mm. Achene brown, fusiform, 3.5–4 mm, with 20 slender ribs, apex slightly constricted. Pappus white, 4–5 mm, persistent. Fl. Jun–Jul. 2n = 12.

Moist meadows, stream banks; 1200–2400 m. Xinjiang [Kazakhstan, C Russia].


Hieracium tectorum (Linnaeus) Kuntze.

Herbs 30–90 cm tall, annual or biennial, ± rosulate, with taproot. Stem usually solitary, erect, branched from base or middle, subglabrous to arachnoid pubescent, sparsely glandular and with white bristles, leafy. Basal and lower stem leaves linear-lanceolate, lanceolate, or oblanceolate and attenuate into a winged petiole-like basal portion, 5–15 × 0.5–1 cm, undivided or more rarely sinuate to pinnatisect, subglabrous to pubescent with glandular and simple hairs, base cuneate-attenuate, margin sparsely dentate, apex acute; lobes (if present) lanceolate to linear. Middle stem leaves similar to lower stem leaves but usu-
Soyeria sibirica

Stiff subulate greenish hairs, leafy. Basal leaves and lower stem peduncle (1–)2–15 cm, form, with few to several capitula. Capitula many flowered; reduced in size, margin entire. Synflorescence laxly corymbiform to corymbosely paniculate, with few to several capitula. Capitula with many florets; peduncle 1.5–4 cm or more. involucre dark green to blackish, broadly cylindric to campanulate, 1–1.3 × 0.7–1 cm. Phyllaries abaxially glabrous or sparsely white hairy (especially at apex) or with black long simple hairs on midvein, apex acute; outer phyllaries narrowly triangular to lanceolate, longest ca. 6–7 mm. Anther tube 3.5–4 mm. Achene ± cylindrical to fusiform, 4–6 mm. Pappus white, ca. 6 mm. Fl. and fr. Jul.–Oct. 2n = 8.

Forest margins, grasslands in valleys, fields, wastelands; 900–1800 m. Heilongjiang, Nei Mongol, Xinjiang [Kazakhstan, Mongolia, Russia; Europe].


Crepis sibirica

Aracium sibiricum (Linnaeus) Schultz Bipontinus; Crepis ruprechtii Boissier; Haploasteum sibiricum (Linnaeus) D. Don; Hieracoides ruprechtii (Boissier) Kuntze; Hieracium sibiricum (Linnaeus) Lamarck; Lepicaune sibirica (Linnaeus) K. Koch; Sonchus caucasicus Biehler; S. flexuosus Ledebour; Sovertia sibirica (Linnaeus) Monnier.

Herbs 0.5–1.5 m tall, perennial, with stout horizontal to oblique rhizomes. Stem solitary, stout, apically rather sparsely branched, especially apically with white arachnoid hairs and stiff subulate greenish hairs, leafy. Basal leaves and lower stem leaves with a winged petiole 6–15 cm or more; leaf blade narrowly oblong-elliptic, oblong-ovate, or ovate, or elliptic, 16–20 × 5.5–10 cm, abaxially scabrid and white hispid and hisurate on veins, adaxially glabrous, margin hispid, base abruptly narrowed to rarely attenuate, margin ± coarsely dentate, apex acute to acuminate. Middle stem leaves similar to lower stem leaves but petiole shorter, more broadly winged, dentate, and basally clasping; leaf blade ovate to lanceolate, basally attenuate. Upper stem leaves sessile and smaller, otherwise similar to middle stem leaves; uppermost stem leaves elliptic to linear-lanceolate, reduced in size, margin entire. Synflorescence laxly corymbiform, with few to several capitula. Capitula many flowered; peduncle (1–)2–15 cm, stout. Involucre campanulate, ca. 1.5–2 × 1–1.5 cm, dark green in fruit. Phyllaries abaxially with dense stiff subulate hairs especially on midvein; outer phyllaries ovate-lanceolate to narrowly elliptic-lanceolate, longest more than 1/2 as long as inner ones, apex acute to obtuse; inner phyllaries adaxially glabrous, apically subacute. Achene dark brown to reddish brown, fusiform, 9–10 mm, subcurved, with 20 ribs, apically attenuate. Pappus white or pale yellowish white, 8–9 mm. Fl. and fr. May–Sep.

Mountain slopes, forest margins, forests, thickets, grasslands in forests; 1000–2700 m. Heilongjiang, Liaoning, Nei Mongol, Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan; E Europe].


Crepis liraeformis var. cinerascens Fischer & C. A. Meyer; Hieracoides coreana (Schrenk ex Fischer & C. A. Meyer) Kuntze.

Herbs 10–25–30 cm tall, perennial, rosulate, with taproot sometimes shoot-bearing. Caudex 1–3 cm, covered with brown leaf bases of former leaves, simple or branched and thus with 1 or few leaf rosettes. Stems one or a few, slender, ascending to erect, simple or forked, sparsely white arachnoid hairy axially [sometimes additionally with long dark green to blackish glandular hairs], usually ± leafless. Rosette leaves Numerous, oblanceolate to elliptic, 4–8 × 0.5–1 cm, shallowly pinnatifid to pinnatisect, abaxially weakly white arachnoid hairy [sometimes additionally with glandular hairs], base attenuate into a petiole-like portion, margin sinuate-dentate or entire; lateral lobes narrowly triangular, lanceolate, or sublinear, apex acute; terminal lobe triangular to lanceolate, apex acute. Stem leaves 0–2, ± linear, reduced in size, margin entire, apex acute. Capitula 1 or 2 per stem, with many florets. Involucre narrowly campanulate, 9–12 × 5–8 mm. Phyllaries abaxially white arachnoid hairy especially along midvein [sometimes additionally with long dark green to blackish glandular hairs]; outer phyllaries linear-lanceolate, longest ca. 5 mm, apex acute; inner phyllaries ca. 12, adaxially appressed hairy, margin scarious, apex acute. Another tube ca. 4 mm. Achene orangish brown, fusiform, 5–6 mm,
straight or subcurved, with 10–15 ribs, apex weakly attenuate. Pappus white, 4–6 mm. Fl. Jul.

Gravely areas on mountain slopes; 1000–3800 m. Qinghai, Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan].

The diploid Crepis oreades and the tetraploid, hybridogenous C. crocea (presumably C. oreades × C. bungei Ledebour ex Candolle) are very similar. In China, C. oreades is of much more restricted distribution, and the very limited material seen is of the (typical) form with involucres and peduncles exclusively white arachnoid hairy, whereas in adjacent Kyrgyzstan and Tajikistan the form (described as C. oreades var. cineraecens) additionally with blackish glandular hairs on involucres and peduncles prevails.


北方还阳参 bei fang huan yang shen

Hieracium croceum Lamarck, Encycl. 2: 360. 1786; Berinia crocea (Lamarck) Schultz Bipontinus; Crepis areea Reichenbach var. crocea (Lamarck) Candolle; C. gmellinii Schultz var. grandifolia Tausch; C. pallasi Turczaninov, nom. illeg. superfl.; C. turczczaninowii C. A. Meyer; Hieracioides crocea (Lamarck) Kuntze.

Herbs 8–30 cm tall, perennial, rosulate, with taproot frequently shoot-bearing. Caudex 0.5–2 cm, simple or usually very shortly branched and thus with 1 or few leaf rosettes, covered with brown leaf bases of former leaves. Stems 1 or a few, slender, ascending to erect, simple or 1- to few forked, arachnoid hairy and with yellow longer and shorter strong glandular hairs, base attenuate and non-glandular hairs especially apically, usually ± leafless. Rosette leaves numerous, obovate to elliptic, 2.5–10 × 1–2.5 cm, shallowly pinnatifid to pinnatisect, both faces white arachnoid hairy and with dark green to blackish long hairs, apex acute to obtuse; inner phyllaries 10–15 ribs, apically attenuate. Pappus white, 5.5–6.5 mm. Fl. and fr. Jul–Oct.

Gravely areas on floodplains, stony slopes; 500–1500 m. Xinjiang [Kazakhstan, Mongolia, Russia].


万丈深 wan zhang shen

Herbs 15–70 cm tall, perennial, with a strong taproot. Caudex woody, simple or branched, leafless. Stem dark green, erect, apically branched and setose, basally glabrous and with few scalelike leaves only in and above middle with well-developed leaves. Lower scalelike stem leaves lanceolate, 0.5–2 cm. Fl. and fr. May–Aug.

Mountain slopes, loess hills, wastelands; 800–2900 m. Gansu, Hebei, Nei Mongol, Qinghai, Shaanxi, Shanxi [Mongolia, E Russia].

Crepis pallasi is a homotypic synonym of Hieracium croceum.


金黄还阳参 jin huang huan yang shen

Hieracium chrysanthum Ledebour, Fl. Altaic. 4: 129. 1833; Berinia chrysantha (Ledebour) Schultz Bipontinus;

Crepis polytricha (Ledebour) Turczaninov; Hieracioides chrysantha (Ledebour) Kuntze; Hieracium frigidum Steven ex Candolle; H. polytrichum Ledebour; Soyeria chrysantha (Ledebour) D. Dietrich;

Herbs 10–25 cm tall, perennial, with a vertical to oblique rhizome. Stems solitary or several, green or basally tinged with purple, branched or 1-branched, sparsely arachnoid hairy but apically densely so under capitula and with dark green to blackish long hairs. Basal leaves crowded, obovate to elliptic-oblongolate, or spatulate, 3–7 × 0.4–1.5 cm, glabrous or axially sparsely arachnoid hairy, base attenuate into a petiole-like portion, margin sinuate-dentate to subentire, apex obtuse. Stem leaves 2 or 3(or 4), similar to basal leaves but smaller and narrower, base attenuate, margin subentire, apex obtuse to acute. Capitulum solitary or 2, many flowered. Involucres and peduncles white to blackish, campanulate, 1.4–1.6 × 0.8–1.2 cm. Phyllaries abaxially white arachnoid hairy and with dark green to blackish long hairs, apex acute to obtuse; outer phyllaries lanceolate, longest to 2/3 as long as inner ones, spreading-erect; inner phyllaries 15–18, adaxially appressed hairy. Anther tube 4–5 mm. Achene reddish brown to dark purple, fusiform, ca. 7 mm, straight or subcurved, with 12–15 ribs, apically attenuate. Pappus white, 5–7 mm, persistent. Fl. and fr. Jul–Sep.

Gravely areas on mountain slopes; 1000–3800 m. Qinghai, Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan].

The entire plants are used medicinally.

Crepis phoenix and the following three species of fairly restricted distribution in chiefly S China are closely related and seem to form a complex, in which introgression and hybridization and diploid and polyploid cytotypes in all species occur. Delimitation of species in this complex is difficult and has already been stated as tentative by Babcock (Univ. Calif. Publ. Bot. 22: 632ff. 1947). A revision of the complex based on field and population studies is still needed.

果山还阳参 guo shan huan yang shen

Herbs 40–50 cm tall, perennial, with a strong taproot. Caudex woody, simple or branched, leafless. Stems solitary or several, green, dark green, or tinged with purple, erect, apically branched, smooth, glabrous, basally only with a few scalelike leaves, in and above middle with well-developed leaves. Lower scalelike stem leaves linear-lanceolate, 5–10 × 1–3 mm. Middle stem leaves sessile, linear, 2–14 × 0.1–1 cm, abaxially somewhat canescent tomentulose, margin entire and revolute, apex acute to acuminate. Upper stem leaves similar to middle stem leaves but smaller, uppermost ones bractlike. Synflorescence airy, with few to several capitula. Capitula with 10–12 (sometimes more) florets. Involucre cylindric, 8–9 × 2–2.5 mm, glabrous; middle stem leaves filiform, to 3 × 0.5 cm, glabrous, margin entire. Uppermost stem leaves linear-sulcate, bractlike, glabrous. Synflorescence virgately corymbose to panicle. Heads 4–5 mm. Fl. and fr. Feb–Jul.


还阳参 huan yang shen

*Crepis rigescens* subsp. *linneas* Babcock.

Herbs 20–60 cm tall, perennial, with a strong taproot. Caudex woody, simple or branched, leafless. Stems solitary or several, erect, basally woody, sparsely to moderately and ± dichotomously branched from base, middle, or near apex; branches sulcate to angular, yellowish striate, leafy, lower leaves often sterile. Leaves pale yellowish green, glabrous; basal leaves small, scalelike; middle stem leaves sessile, linear, 3–8 × 0.1–5 cm, rigid in texture, margin entire and revolute, apex acute. Synflorescence ± dichotomously corymbose, with few to several capitula. Capitula with 10–12 (sometimes more) florets. Involucre narrowly cylindric, 8–9 × 2–2.5 mm. Phyllaries glabrous or arachnoid hairy; outer phyllaries linear to lanceolate, longest 1/2–2/3 as long as inner ones, apex acute; inner phyllaries adaxially glabrous, apex obtuse. Anther tube ca. 4 mm. Achene brown, fusiform, ca. 4 mm, with 14 ribs, apically attenuate. Pappus white, 4–5 mm. Fl. and fr. Jun–Jul.

- Forests, thickets; 1500–2900 m. Xizang, Yunnan.

See remarks under *Crepis phoenic*. above.


芜菁还阳参 wu jing huan yang shen


Herbs 40–150 cm tall, perennial, rosetulate. Taproot cylindric to narrowly turniplike, ca. 1 cm in diam. Caudex 0.5–3 cm, woody, sometimes branched, with rather sparse leaf rosette and below covered with bases of old leaves and brown lanate. Stem slender, erect, unbranched in proximal portion, usually leafless, apically with narrow synflorescence. Rosette leaves obovate to ovate, 5–26 × 2–6.5 cm, on both faces with short stiff subulate hairs, base attenuate into a 0.5–3 cm petiole-like portion, margin entire or sinuate-dentate to shallowly pinnatifid with orbicular to broadly triangular segments, apex obtuse to round and mucronulate or more rarely acute. Stem leaves (if present in lower part) similar to rosette leaves but smaller. Synflorescence racemiform to very narrowly panicle, with some to numerous capitula. Capitula with 5–10 florets; peduncle filiform, 1–5 mm. Involucre cylindric, 7–9 × 2–3 mm. Phyllaries green to dark green, ciliate near and at apex otherwise both faces glabrous; outer phyllaries lanceolate, longest 1/3–1/2 as long as inner ones, apex acute; inner phyllaries 5(5 or 6), apex acute to obtuse. Anther tube 3.5–4 mm. Style branches dark (blackish) upon drying. Achene pale brown, cylindric to fusiform, ca. 4 mm, with 10 ribs, apically attenuate. Pappus yellowish white, ca. 4 mm. Fl. and fr. Jun–Oct.

- Mountain slopes, forests in river valleys; 1400–3300 m. Guizhou, Sichuan, Yunnan.

See note under *Crepis phoenic* above.


芜菁还阳参 wu jing huan yang shen

Herbs 40–150 cm tall, perennial, rosetulate. Taproot cylindric to narrowly turniplike, ca. 1 cm in diam. Caudex 0.5–3 cm, woody, sometimes branched, with rather sparse leaf rosette and below covered with bases of old leaves and brown lanate. Stem slender, erect, unbranched in proximal portion, usually leafless, apically with narrow synflorescence. Rosette leaves obovate to obovate-lanceolate, 5–26 × 2–6.5 cm, on both faces with short stiff subulate hairs, base attenuate into a 0.5–3 cm petiole-like portion, margin entire or sinuate-dentate to shallowly pinnatifid with orbicular to broadly triangular segments, apex obtuse to rounded and mucronulate or more rarely acute. Stem leaves (if present in lower part) similar to rosette leaves but smaller. Synflorescence racemiform to very narrowly panicle, with some to numerous capitula. Capitula with 5–10 florets; peduncle filiform, 1–5 mm. Involucre cylindric, 7–9 × 2–3 mm. Phyllaries green to dark green, ciliate near and at apex otherwise both faces glabrous; outer phyllaries lanceolate, longest 1/3–1/2 as long as inner ones, apex acute; inner phyllaries 5(5 or 6), apex acute to obtuse. Anther tube 3.5–4 mm. Style branches dark (blackish) upon drying. Achene pale brown, cylindric to fusiform, ca. 4 mm, with 10 ribs, apically attenuate. Pappus yellowish white, ca. 4 mm. Fl. and fr. Jun–Oct.

- Mountain slopes, forests in river valleys; 1400–3300 m. Guizhou, Sichuan, Yunnan.

See note under *Crepis phoenic* above.


抽茎还阳参 chou jing huan yang shen

Herbs 30–50 cm tall, perennial, rosetulate. Taproot woody.
Caudex woody, with rather sparse leaf rosette and 1–3 stems. Stems erect, apically sparsely branched and white pubescent, almost leafless. Rosette leaves oblanceolate to elliptic, 5–10 × 2–3 cm, both surfaces pubescent with short glandular hairs, base attenuate into a short winged petiole-like portion, margin denticulate and irregularly sinuate to dentate, apex obtuse to acute. Stem leaves (if present) few, remote, bractlike, narrowly lanceolate, apex acute. Synflorescence laxly corymbose, with few to some capitula. Capitula with 20–30 florets; peduncle wiry, 1–4 cm. Involucrre broadly cylindric to narrowly campanulate, 7–10 × 4–6 mm. Phyllaries sparsely pubescent with white partly glandular hairs; outer phyllaries lanceolate to linear-lan- ceolate, 7–10 × 4–6 mm. Phyllaries sparsely pubescent with white wiry, 1–4 cm. Involucre broadly cylindric to narrowly campanulate, 7–10 × 4–6 mm. Phyllaries sparsely pubescent with white partly glandular hairs; outer phyllaries lanceolate to linear-lanceolate, longest ca. 1/2 as long as inner ones, apex acute; inner phyllaries with short blackish rigid subulate hairs on midvein, adaxially glabrous, apex obtuse. Achene dark brown, fusiform, 4–5 mm. Fl. and fr. Jul–Aug.

Mountain slopes, moist pastures, fields; 1400–2200 m. Yunnan [N Lao, N Myanmar].


新疆还阳参  xin jiang huan yang shen

Crepis rigida Waldstein & Kitai bel var. songorica Karelin & Kirilov; C. songorica (Karelin & Kirilov) Babcock.

Herbs 20–60 cm tall, perennial, with a taproot. Stems solitary or more rarely 2–4, from a short woody caudex, erect, sparsely branched apically or rarely from middle, sparsely white arachnoid hairy and especially proximally with rigid subulate partly glandelar hairs, covered with leaf bases of former leaves, leafy. Basal and lower stem leaves elliptic-oblaneolate to oblanceolate, 5–24 × 2–5 cm, both faces with rigid mostly glandular hairs but especially abaxially, base attenuate, margin sinuate-dentate, apex obtuse to acute. Middle and upper stem leaves ovate to narrowly elliptic-lanceolate, base auriculately clasping, margin sparsely dentate or entire, apex acute to acuminate, otherwise similar to lower leaves; uppermost stem leaf reduced, bractlike. Synflorescence laxly corymbose, with few to several capitula. Peduncle 1–6 cm, straight or slightly curved. Involucre campanulate, 1.2–1.6 × 0.6–1 cm. Phyllaries abaxially white arachnoid hairy and especially basally and along midvein with ± dense yellowish brown short rigid glandular hairs; outer phyllaries triangular-ovate, triangular, or lanceolate, longest 1/3–2/3 as long as inner ones, apex ± acute; inner phyllaries 12–14, adaxially glabrous, margin scarious, apex obtuse. Anther tube 4.5–5.5 mm. Achene dark reddish brown, fusiform, 7–10 mm, with 16–20 ribs. Pappus white, 8–10 mm. Fl. and fr. Jun–Aug.

Rocky or gravelly mountain slopes; 1300–2600 m. Xinjiang [E Kazakhstan, Kyrgyzstan, Tajikistan].

Crepis darvazica has been reported generally from the border range between China, E Kyrgyzstan, and NE Tajikistan (Czerpanov, Fl. URSS 29: 633, 1966), but so far no substantiated records from Chinese territory are known (C. H. An, Fl. Xinjiang, 5: 456, 1999). The above description is based on material from E Kazakhstan and the descriptions by Czerpanov (loc. cit.) and Babcock (Univ. Calif. Publ. Bot. 22: 426. 1947).


全叶还阳参  quan ye huan yang shen


Herbs, perennial, with a horizontal rhizome. Stem solitary, ca. 25 cm tall, slender, erect, apically sparsely branched and with blackish stipitate glandular hairs, leafy. Basal leaves incompletely known, lanceolate, small, margin entire or subentire, withered at anthesis. Lower and middle stem leaves sessile, lanceolate to oblanceolate, 3.5–5 × 1–2 cm, glabrous, base auriculately clasping, margin entire, apex rounded and mucronulate. Upper stem leaves bractlike, lanceolate. Synflorescence laxly corymbose, with 3–5 capitula. Capitula with 20–30 florets; peduncles usually 1–9 cm, slender. Involucre cylindric to narrowly campanulate, 8–10 × 4–6 mm. Phyllaries green to blackish green, abaxially with blackish stipitate glandular hairs on midvein; outer phyllaries lanceolate, longest to 4 mm; inner phyllaries 8–10?, adaxially glabrous. Anther tube 3–3.5 mm. Style branches yellow. Achene yellowish brown, fusiform, ca. 5 mm, with 15 ribs, apex truncate. Pappus white, ca. 6 mm. Fl. and fr. Aug.

● Grasslands; 1300–1400 m. N Xinjiang (Altay Shan).

Crepis shihii is a conspicuous species of unclear affinities only known from the type collection and superficially appears to be a diminutive version of C. darvazica.


天山还阳参  tian shan huan yang shen

Pseudoyounglia tianshanica (C. Shih) D. Maity & Maity; Tibetoseris tianshanica (C. Shih) Tzvelev.

Herbs 3–5 cm tall, perennial. Stem erect or ascending, pubescent, leafy. Leaves oblaneolate, 2.5–4 × 0.5–0.8 cm, lyrate-pinnatifid to pinnatisect, both faces sparsely pubescent or abaxially glabrous, base attenuate or abruptly narrowed into a petiole-like portion; lateral lobes 3 or 4 pairs, triangular, rhomboid, or irregularly rhomboid, margin entire, apex acute, obtuse, or rounded; terminal lobe elliptic, ovate, hastate, or sagittate, apex obtuse to acute. Capitula 2, terminal. Involucre cylindric to narrowly campanulate, ca. 1.2 cm. Phyllaries dark, abaxially sparsely arachnoid hairy and with blackish multicellular hairs on midvein; outer phyllaries narrowly elliptic-lanceolate, longest more than 1/2 as long as inner ones, apex acute; inner phyllaries adaxially glabrous, apex acute to obtuse. Achene not seen when mature. Pappus white, ca. 4 mm. Fl. Jul.

● Mountain slopes; 2600 m. Xinjiang (Tian Shan).


黄鹌菜属 huang an cai shu
Shi Zhu (石铸 Shih Chu); Norbert Kiliian

*Pseudoyoungia* D. Maity & Maiti.

Herbs, perennial or annual, acaulescent or caulescent, often ± rosulate, glabrous or somewhat to sparsely arachnoid hairy or pubescent. Synflorescence corymbiform or paniculiform-corymbiform, exceptionally secondly racemiform. Capitula with 5–25 florets. Involucre cylindric, cylindric-campanulate, campanulate, or broadly cylindric. Phyllaries abaxially glabrous or more rarely somewhat arachnoid hairy, very rarely glandular; outer phyllaries few to several, centripetally longer, at most 1/4(–1/2) as long as inner ones; inner phyllaries usually linear-lanceolate, equal in length, midvein subapically crested and corniculate or flat. Receptacle naked. Florets yellow. Achene ± fusiform, columnar, or ± cylindric, inconspicuously compressed or subcompressed, with 4 or 5 main ribs each accompanied by (1 or)2 or more slender secondary ribs, ribs usually finely spiculate especially apically, apex attenuate or rarely with a stout short beak. Pappus white, rarely gray or pale brownish, scabrid.

About 30 species: E Asia; 28 species (22 endemic) in China.

The circumscription of *Youngia* has recently been changed by Seminkov and I. D. Illarionova (Komarova 5: 96. 2008) based, in particular, on carpological analyses. Three species groups have been segregated into three newly established separate genera: *Crepidifolium*, *Sonchella*, and *Tibetoseris*. *Crepidifolium* includes Babcock and Stebbins’s (Publ. Carnegie Inst. Washington 484: 25. 1937) single species of their (not validly published) “Y. sect. Crepidoposis,” meanwhile divided into three separate species. Most recent molecular phylogenetic analyses of the *Crepidinae* by J. W. Zhang et al. (in prep.) on the one hand confirmed that *Crepidifolium* is not part of *Youngia*, but on the other hand revealed that it is actually nested within *Crepis*, see there. *Sonchella* unites *Y. stenoma* of Babcock and Stebbins’s (not validly published) “Y. sect. Stenophyllum” and a second species formerly treated as *Prenanthes angustifolia* or *Crepis potentis*. This genus has been confirmed in the molecular phylogenetic analyses by J. W. Zhang et al. (in prep.) as independent and is treated as such here. *Tibetoseris* included the five species of Babcock and Stebbins’s (not validly published) “Y. sect. Desiphyllum” and a few later additions from China. *Tibetoseris* was most recently recircumscribed by D. Maity and Maiti (Compositae Newslett. 48: 22–42. 2010) to include only *Y. depressa*, while the other species, considered from morphology as unrelated, were segregated into the newly established genus *Pseudoyoungia*. While their assumption of *Tibetoseris* being diphyletic has been confirmed in the molecular phylogenetic analyses by J. W. Zhang et al. (in prep.), the exclusion of the species united in *Pseudoyoungia* from *Youngia* has not; they appear clearly nested in *Youngia*. *Pseudoyoungia* is here therefore sunk in the synonymy of *Youngia*. Finally, examination of the type material of *Y. blinii*, considered as an unusual and isolated species of *Youngia* since its inclusion by Babcock and Stebbins (Univ. Calif. Publ. Bot 18(11): 227–229. 1943, as *Y. setigera*), revealed that it is grossly misplaced in *Youngia* but conveniently fits into *Dubyaeca*, where it is transferred in the present treatment. The genus is still in need of a revision at species level. Many species are known from few collections only and their justifications need to be confirmed by a thorough study of character variation on the basis of more material. The current treatment should be used with critical caution.

1a. Plants ca. 5(–8) cm tall, very rarely taller (to 15 cm) and acaulescent or stem very short and branched within or slightly above leaf rosette with capitula few to several, clustered; involucre 8–12 mm with longest outer phyllary 1/3–1/2(–2/3) as long as inner ones.
2a. Peduncle slender; involucre 1.2–1.6 cm; pappus 10–11 mm ................................................................. 3. *Y. simulatrix*
2b. Peduncle capillaceous; involucre 0.8–1.1 cm; pappus 5–7 mm.
3a. Phyllaries abaxially arachnoid hairy ........................................................................................................ 6. *Y. sericea*
3b. Phyllaries abaxially glabrous.

4a. Involucre 10–11 mm; longest outer phyllary 1/3–2/3 as long as inner ones; inner phyllaries adaxially appressed pubescent ........................................................................................................ 7. *Y. conjunctiva*
4b. Involucre 8–10 mm; longest outer phyllary 1/3–1/2 as long as inner ones; inner phyllaries adaxially glabrous.
5a. Longest outer phyllary to 1/3 as long as inner ones; midvein of inner phyllaries subapically plane ......................................................................................................................... 4. *Y. gracilipes*
5b. Longest outer phyllary to 1/2 as long as inner ones; midvein of inner phyllaries subapically crested or corniculate ........................................................................................................... 5. *Y. cristata*

1b. Plants caulescent, usually very distinctly so, or if stem very short then capitula not clustered but all borne distinctly above leaf rosette and longest outer phyllary usually at most 1/4 as long as inner ones (if 1/3–1/2(–2/3) as long see *Y. conjunctiva* above); involucre 5–13 mm.
6a. Pappus ash-gray, yellowish brown, or pale brown.
7a. Pappus ash-gray; synflorescence corymbiform on a stem with well-developed distant leaves.
8a. Peduncle and involucre ± shortly glandular hairy (rarely glabrous); midvein of inner phyllaries subapically always plane; style branches yellow upon drying ................................................................. 1. *Y. cineripappa*
8b. Peduncle and involucre glabrous; midvein of some inner phyllaries subapically crested or corniculate; style branches brown or green upon drying ................................................................. 2. *Y. atripappa*
7b. Pappus yellowish brown or pale brown; synflorescence corymbiform on a leafless stem, or else not corymbiform.
9a. Synflorescence corymbiform; capitula erect, with ca. 5 florets; involucre 6–7 mm .......... 27. *Y. szechuanica*
9b. Synflorescence secundly racemiform; capitula nodding, with 10–20 florets; involucre 10–13 mm .................................................. 28. *Y. racemifera*

6b. Pappus white.
10a. Involucre 4–7 mm; synflorescence (except in depauperate plants) moderately to richly branched, with some, many, or numerous capitula; inner phyllaries with midvein subapically strictly plane.
11a. Leaves undivided; basal leaves with petiole to 15 cm, as long as hastate-cordate blade .......... 22. *Y. longipes*
11b. Leaves except early basal ones always pinnately lobed; basal leaves with basal petiole-like portion much shorter than remainder of leaf.
12a. Basal, lower, and middle stem leaves bipinnately lobed, lateral lobes as broad as terminal lobe ............................................................. 21. *Y. rosthornii*
12b. Leaves at most pinnately lobed, lateral lobes usually much narrower and smaller than terminal lobe.
13a. Plants annual to perennial; stem leaves always well developed, pinnatipartite to pinnatisect, lateral lobes of all leaves ovate or elliptic, terminal lobe long acuminate; involucre 6–7.5 mm; achene 2.5–3 mm .................................................. 20. *Y. heterophylla*
13b. Plants strictly annual; stem leaves mostly soon reduced and undivided, or if well developed and pinnately lobed then lateral lobes triangular or rhomboidal, terminal lobe obtuse, acute, or shortly acuminate; involucre 4–5(–7) mm; achene 1.5–2.5 mm.
14a. Achene light brown, dark reddish, or purplish brown, apex strongly attenuate; pappus persistent ..................................................................................................... 24. *Y. japonica*
14b. Achene clear red, apex contracted into a stout 0.2–0.4 mm beak; pappus ± deciduous.
15a. Involucre 4–6 mm; pappus 2.5–3 mm ............................................. 25. *Y. erythrocarpa*
15b. Involucre 6–7 mm; pappus 3–4 mm ................................. 26. *Y. rubida*

10b. Involucre (6–)7–10(–13) mm; synflorescence poorly to moderately branched, with few, some, or more rarely with many capitula; inner phyllaries either all with midvein plane or some with midvein subapically crest or cornicate.
16a. Midvein of all inner phyllaries plane.
17a. Inner phyllaries adaxially glabrous; later basal and stem leaves pinnatifid to pinnatisect, rachis often pectinate between lateral lobes ................................................................. 17. *Y. wilsonii*
17b. Inner phyllaries adaxially appressed pubescent; later basal and stem leaves pinnatisect, rachis not pectinate between lateral lobes.
18a. Lobes of pinnate leaves basally often with a large tooth; achene 3–3.5 mm ...................... 18. *Y. henryi*
18b. Lobes of pinnate leaves entire; achene 2–3 mm.
19a. Plants delicate, 10–30 cm tall; involucre ca. 7 mm; achene 2–2.5 mm .......... 15. *Y. hastiformis*
19b. Plants usually rather robust, to 60 cm tall; involucre 7–11 mm; achene 2.5–3 mm .... 16. *Y. prattii*

16b. Midvein of at least some inner phyllaries subapically crest or cornicate.
20a. Rosette leaves contracted or attenuate into a very long (to 9 cm) inconspicuously winged petiole-like basal portion at least as long as or longer than remainder of leaf .......... 19. *Y. terminalis*
20b. Rosette leaves without petiole-like portion, or if with one then distinctly shorter than remainder of leaf.
21a. Involucre 8–13 mm; inner phyllaries adaxially pubescent; pappus 5–9 mm.
22a. Plants to 100 cm tall; involucre (0.8–)0.9–1.3 cm; longest outer phyllaries 1.5–3 mm .................................................. 8. *Y. paleacea*
22b. Plants at most 30 cm tall; involucre 0.8–1 cm; longest outer phyllaries ca. 1.5 mm ................................................................. 9. *Y. pilifera*
21b. Involucre 6–8 mm; inner phyllaries adaxially glabrous or appressed pubescent; pappus 2.5–5.5 mm.
23a. Stem very slender or capillaceous, almost leafless or leafless with 1–5 capitula.
24a. Involucre ca. (7–)8 mm; pappus 5–5.5 mm ......................... 14. *Y. kangdingensis*
24b. Involucre 6–7 mm; pappus 2–5 mm.
25a. Plants delicate, 3–10 cm tall; rosette leaves 1–7 × 0.3–1 cm; stem capillaceous; pappus 4–5 mm ........................................... 13. *Y. yilingii*
25b. Plants more robust, 10–15 cm tall; rosette leaves 5–10 × 1–2 cm; stem slender; pappus ca. 2.5 mm ........................................... 23. *Y. bifurcata*
23b. Stem usually more robust, usually with few leaves and more than 5 capitula.

2. *Youngia atripappa* (Babcock) N. Kilian, comb. nov.


角冠黄鹌菜 jiao guan huang an cai


Herbs 3–5 cm tall, perennial, rosulate, subacaulescent. Taproot and lateral shoot-bearing roots giving rise to secondary rosette shoots. Caudex short, unbranched or weakly branched, with residues of old leaf bases. Rosette leaves ob lanceolate, 2–4 × ca. 1 cm, pinnatifid to pinnatipartite, sparsely tomentose, base attenuate into a petiole-like portion, margin entire; lateral lobes 4–6 pairs, narrowly triangular but basal lobes usually toothlike, apex acute; terminal lobe with apex acute to acuminate. Capitula 3–14, clustered, directly from axils of rosette leaves or from a stalk, with 12–18 florets; stalk short, capillaceous, branched; peduncle capillaceous, 1–4 cm, ± pilose to apically ± tomentose, ± bracteate. Involucre cylindric, 8–10 mm. Phyllaries dark to blackish green, abaxially glabrous; outer phyllaries ovate to lanceolate, longest to 1/2 as long as inner ones, margin scarious, subapically crested or corniculate, apex acute. Anther tube greenish upon drying. Achene not seen when mature. Pappus white, ca. 7 mm. Fl. Aug.

● Mountain slopes; ca. 3900 m. SE Xizang (Zayü).


绢毛黄鹌菜 juan mao huang an cai

_Pseudoyoungia sericea_ (C. Shih) D. Maity & Maiti; _Tibetoseris sericea_ (C. Shih) Sennikov.

Herbs 3–6 cm tall, perennial, rosulate, subacaul escent. Taproot and lateral shoot-bearing roots giving rise to secondary rosette shoots. Caudex short, unbranched or weakly branched, with residues of old leaf bases. Rosette leaves ob lanceolate to narrowly elliptic, 2–5 × 0.3–1 cm, pinnatifid to pinnatipartite and sometimes lyrately so, sparsely pubescent, base attenuate into a petiole-like portion, margin entire to weakly sinuate-dentate; lateral lobes 3–6 pairs, opposite to subopposite, ovate to elliptic but basal lobes usually toothlike, apex rounded to obtuse; terminal lobe elliptic, apex rounded to obtuse. Capitula 3–14, clustered, directly from axils of rosette leaves or on a stalk, with 12–20(–30?) florets; stalk 1–4 cm, capillaceous, branched, sometimes reduced-leafy; peduncle capillaceous, 1–8 cm, ± pilose to apically ± tomentose, ± bracteate. Involucre broadly cylindric, 8–10 mm. Phyllaries dark to blackish green, abaxially glabrous; outer phyllaries ovate to lanceolate, longest to 1/2 as long as inner ones, margin scarious, subapically crested or corniculate, apex acute. Anther tube greenish upon drying. Achene not seen when mature. Pappus white, ca. 7 mm. Fl. Aug.

● Gravelly mountain slopes, rocky slopes; 3300–3400 m. SE Xizang (Zayü).

From the place of its first publication (C. Shih, Acta Phytotax. Sin. 33: 185. 1995), the name _Youngia sericea_ was not validly published because two specimens of different gatherings were simultaneously designated as types (see Vienna Code, Art. 37.1 and 37.2). The name was validated with its original authorship in a nomenclatural note by Sennikov in 2007, as given above.

Herbs 4–12 cm tall, perennial, rosulate. Taproot and short woody caudex with residues of old leaf bases. Stem solitary, erect, branched apically or from near base, densely tomentose but glabrescent with age, distantly leafy. Rosette leaves oblong-lanceolate, 1.5–6 × 0.5–1.2 cm, both faces tomentose to glabrescent, base attenuate into a petiole-like portion and semi-amplexicaul, margin sinuately to runcinately dentate and/or runcinately pinnatifid, apex obtuse to acute; lobes (if present) narrowly triangular, apex acute to acuminate. Stem leaves none or few, similar to rosette leaves but smaller, with narrower lobes, and apex acuminate. Synflorescence laxly corymbiform, with 4–8 capitula. Capitula with 13–18 florets; peduncle 1–6 cm, slender, densely tomentose. Involucre narrowly cylindric, 1–1.1 cm. Phyllaries dark green, ciliate otherwise abaxially glabrous, apex acute; outer phyllaries lanceolate to linear-lanceolate, longest 1/3–1/2(–2/3) as long as inner ones; inner phyllaries ca. 8, adaxially densely tomentose with apical mucronate; terminal lobe lanceolate, triangular, or falcate, apex acute. Anther tube greenish. Style branches yellow upon drying. Achene dark brown to blackish, subfusiform, 3–4 mm, ribs finely spicate, apex attenuate. Pappus white, 5–7(–9) mm. Fl. and fr. May–Sep. 2n = 32*.

- Forests on mountain slopes, mountain valleys, forest margins, thickets, grassy slopes; 1800–3800 m. Gansu, Sichuan, Xizang, Yunnan.

*Youngia paleacea* is a fairly polymorphic species, probably representing a polyploid complex as was first noted by Babcock and Stebbins (Publ. Carnegie Inst. Washington 484: 68. 1937). Further studies are required also for the following species, *Y. pilifera*.


Herbs 8–30 cm tall, perennial, caudex often with residues of old leaf bases. Stem slender, erect, branched from base or middle third, almost leafless; branches sericeous below, glabrous above. Basal leaves elliptic, ovate-elliptic, broadly ovate, oblong-elliptic, or orbicular, 2–5 × 0.6–1.5 cm, lyrate pinnatifid or undivided, densely striose, base attenuate or constricted into a winged petiole-like portion, apex rounded to obtuse; lateral lobes 2–4 pairs, triangular to elliptic, margin entire, apex acute, rounded, or obtuse; terminal lobe elliptic, hastate, or irregularly hastate, much larger than lateral ones, margin entire or retrorsely dentate, apex rounded to obtuse. Stem leaves 1 or 2, narrowly elliptic to linear, reduced in size, apex long acuminate. Synflorescence corymbiform to panicleiform-corymbiform, with few to some capitula. Capitula with 11 florets. Involucre narrowly cylindric, 8–10 mm. Phyllaries dark green, abaxially glabrous; outer phyllaries broadly ovate, longest ca. 1.5 mm, apex acute to obtuse; inner phyllaries ca. 8, adaxially appressed hairy, midvein subapically or pinnately, apex white scarious, apex acute to obtuse. Achene not seen when mature. Pappus white, ca. 5 mm. Fl. Jul.

- Thickets in mountain valleys, moist areas in river valleys; 3200–3600 m. W Sichuan (Kangding).

*Youngia pilifera* is close to the polymorphic *Y. paleacea* and possibly only a delicate dwarf morph of the latter. See also note under *Y. paleacea*.


Herbs 30–100 cm tall, perennial. Taproot woody. Caudex often with residues of old leaf bases. Stem solitary, slender, erect, branched from near base or only apically, glabrous or very sparsely white tomentose, distantly leafy or more rarely almost leafless. Basal and lower stem leaves oblong-elliptic, elliptic, or narrowly elliptic, 2–19 × 0.5–4 cm, pinnatifid, pinnatisect or runcinate or lyrate, both surfaces ± pubescent with pale brown hairs, base attenuate into a winged petiole-like portion; lateral lobes 2–7 pairs, opposite to obliquely opposite, ± broadly triangular to triangular-ovate, margin entire or sinuate-dentate, apex acute, long acute, obtuse, or rounded and often mucronate; terminal lobe lanceolate, triangular, or falcate, margin dentate or entire. Middle and upper stem leaves similar to lower ones but smaller, narrower, and divided or undivided; uppermost stem leaves reduced, undivided, and bractlike. Synflorescence corymbiform, with few to many capitula. Capitula with 9–16 florets; peduncle usually 0.5–3 cm, slender. Involucre cylindric, (0.8–)0.9–1.3 cm. Outer phyllaries broadly ovate to lanceolate, longest 1.5–2(–3) mm, apex acute; inner phyllaries ca. 8, abaxially glabrous, adaxially appressed hairy, midvein subapically or pinnately, margin white scarious, apex acute. Anther tube greenish. Style branches yellow upon drying. Achene dark brown to blackish, subfusiform, 3–4 mm, ribs finely spicate, apex attenuate. Pappus white, 5–7(–9) mm. Fl. and fr. May–Sep. 2n = 32*.

- Thickets in mountain valleys, moist areas in river valleys; 3200–3600 m. W Sichuan (Kangding).

*Youngia pilifera* is close to the polymorphic *Y. paleacea* and possibly only a delicate dwarf morph of the latter. See also note under *Y. paleacea*.

Herbs 20–40 cm tall, perennial, rosulate. Taproot slender. Caudex from residues of old leaf bases. Stem solitary, erect, branched from near base or higher up, sparsely brown arachnoid hairy and somewhat more densely so at bifurcations, distantly leafy. Rosette and lower stem leaves oblanceolate, 4–10 × 1–3 cm, lyrate or runcinately pinnatifid or pinnatisect, abaxially ± strongly brown arachnoid hairy, adaxially short brown crinkled hairy, base attenuate into a short ± winged petiole-like portion and semiamplexicaul, margin sinuate-dentate; lateral lobes ovate, triangular, or elliptic, apex obtuse to acute; terminal lobe obovate, ovate, or broadly triangular, apex obtuse to acute. Middle stem leaves (if any) ± elliptic, smaller, acute; terminal lobe obovate, ovate, or broadly triangular, apex obtuse to acute. Middle stem leaves (if any) ± elliptic, smaller, otherwise similar to lower leaves; upper stem leaves linear, subulate, or bractlike, reduced in size, usually not divided. Synflorescence corymbiform, with to 25 capitula. Capitula with 10–12 florets; peduncle capillaceous, 0.2–2.5 cm, ± brown arachnoid hairy. Involucre narrowly cylindric, 7–8 mm, abaxially glabrous. Outer phyllaries narrowly ovate, longest 1–1.5 mm, apex subacute; inner phyllaries 8, adaxially glabrous or glabrous with a few appressed hairs, midvein often subapically crested, margin narrowly white scarious, apex subacute. Anther tube green. Style branches yellow upon drying. Achene dark brown, columnar, 3–3.5 mm, ribs finely spiculate, apex attenuate. Pappus white, 4–5 mm. Fl. and fr. May–Sep.

- By streams, trailsides in thickets, mountaintops; 2000–3500 m. Guizhou, Yunnan.


绒毛黄鹌菜 rong mao huang an cai

Youngia nujiangensis C. Shih.

Herbs 9–30 cm tall, perennial, rosulate. Taproot slender, with shoot-bearing lateral roots. Caudex short, with residues of old leaf bases. Stems solitary or few, slender, ± erect, pale arachnoid hairy especially at bifurcations, sparsely leafy. Rosette leaves obovate to oblanceolate, 3–10 × 0.5–1.5 cm, almost undivided, or ± lyrate or pinnatifid or pinnatisect, abaxially pale arachnoid hairy, adaxially pubescent with short pale crinkled hairs, base attenuate into a short ± winged petiole-like portion, margin sinuate-dentate, apex obtuse to acute; lateral lobes ovate to triangular, apex rounded to acute and mucronate. Stem leaves 1–3, linear, reduced in size, undivided. Synflorescence corymbiform, with few to less than 10 capitula. Capitula with 9–11 florets; peduncle capillaceous, 4–15 mm, ± white arachnoid hairy. Involucre narrowly cylindric, 6–8 mm, in fruit to 9 mm, abaxially glabrous. Outer phyllaries ovate, longest 1–1.5 mm, apex acute; inner phyllaries 8, adaxially glabrous, midvein often subapically with small crest or claw, margin white scarious, apex acute. Anther tube greenish yellow. Style branches yellow upon drying. Achene dark brown, fusiform, ca. 3.5 mm, subcompressed, ribs finely spiculate. Pappus white, 3.5–5 mm. Fl. May–Jun.

- Among rocks, rock crevices, wastelands; 1700–2700 m. Yunnan.


东川黄鹌菜 dong chuan huang an cai


Herbs 15–25 cm tall, perennial, rosulate. Taproot slender. Caudex with residues of old leaf bases. Stem solitary, slender, erect, branched from middle third or higher, glabrous. Rosette leaves oblanceolate, 3–7 × 1–1.5 cm, undivided, both faces finely pubescent with yellow or brown many-celled hairs, base attenuate into a short petiole-like portion, margin mucronately sinuate-dentate, apex acute to acuminate. Stem leaves few, linear, reduced in size. Synflorescence corymbiform, with few to several capitula. Capitula with ca. 12 florets; peduncle capillaceous, 0.5–1.2 cm, ± submentulose. Involucre cylindric to narrowly campanulate, 6–7 mm, abaxially glabrous. Outer phyllaries ovate, longest ca. 1 mm; inner phyllaries 8, adaxially pubescent with very shortly appressed shiny hairs, midvein subapically often somewhat crested, margin ± white scarious, apex acute and ciliate. Anther tube and style branches yellow upon drying. Achene brownish purple, columnar, ca. 2.5 mm, ribs finely spiculate, apically subattenuate. Pappus white, 3.5–4 mm. Fl. Jun.

- Among rocks; ca. 2600 m. Yunnan.

Youngia mairei is only known from the type collection made in 1912 and is close to Y. lanata and Y. fusca.


艺林黄鹌菜 yi lin huang an cai

Herbs 3–10 cm tall, perennial, rosulate, delicate. Caudex strong, branching with age, with residues of old leaf bases. Stem solitary, capillaceo-simplicibus, simple or 1- or 2-branched from near base or higher up, sparsely hairy, leafless. Basal leaves spatulate, elliptic, or oblanceolate, 1–7 × 0.3–1 cm, both faces glabrous or sparsely white tomentose but abaxially glabrescent, undivided, weakly pinnatifid with 1 or 2 pairs of obtusely triangular or lanceolate lateral lobes, or pinnatifid or pinnatisect with 2–6 opposite or alternate pairs of triangular to ovate, rounded to acute lateral lobes, base attenuate into a petiole-like portion, margin entire to sinuate-dentate, apex obtuse to acute. Capitulum solitary or synflorescence laxly corymbiform, with 2–5 capitula. Capitula with 9–15 florets. Involucre narrowly campanulate, 6–7 mm. Phyllaries abaxially glabrous; outer phyllaries narrowly ovate, longest 1–1.5 mm, apex acute to obtuse; inner phyllaries 8, adaxially sparsely appressed hairy, midvein subapically mostly somewhat crested or cornulate, apex ± acute. Anther tube and style branches yellow upon drying. Achene dark brown, fusiform, 2.5–3 mm, ribs finally spiculate, apex attenuate. Pappus white, 4–5 mm. Fl. and fr. May–Jun.

- Rocky slopes, rocks; 3000–3100 m. NW Yunnan (Zongdian).
The original description of the apparently rare *Youngia yilingii* is based on a single collection from Zhongdian Xian of plants to 5 cm tall with entire to at most weakly pinnatifid, not more than 10 × 3 mm leaves. Another collection from the same county (*B. Alden et al., Kunming Edinburgh Gothenburg Exped. 579; CAL 795201*) is considered also to belong to this remarkable species. It indicates that the leaf shape of the species shows some variation even in the same individual. In this collection only the early leaves of a rosette are similar to the ones described for *Y. yilingii*, while the later ones are larger and all pinnatifid to pinnatisect as described above.


*Herbs 7–20 cm tall, perennial. Taproot with shoot-bearing lateral roots. Stem solitary, slender, erect, sparsely branched from near base or middle. Basal leaves obovate, oblanceolate, or elliptic, 2–5.5 × 5–1.5 mm, pinnatifid to pinnatisect, sparsely pubescent, base attenuate into a short petiole-like portion, margin sinuate-dentate; lateral lobes 1–4 pairs, broadly triangular, small; terminal lobes elliptic to obliquely triangular, margin entire, apex rounded, obtuse, or acute and mucronulate. Stem leaves absent or very few, similar to basal leaves but smaller or more strongly reduced. Synflorescence corymbiform, with usually 3–5 capitula. Capitula with 9–14 florets; peduncle columnar, 2.5–3 mm, ribs finally spiculate, apex attenuate. Pappus white, ca. 5 mm. Fl. and fr. Apr–Jul.*

*By streams, moist open areas; 2500–4000 m. Sichuan (Heishui, Xiangcheng).*

The original description of the little-known *Youngia hastiformis*, based on a single collection from Heishui Xian, has been supplemented by two collections from Xiayechang Xian made at somewhat higher elevations (*D. E. Boutford et al. 28388A and 28925*), which are apparently also referable to this species. See also note under *Y. kangdingensis*.


*Herbs 15–60 cm tall, perennial, ± rosulate. Caudex with residues of old leaf bases. Stem solitary, ± slender, erect, branched from middle, glabrous, distantly sparsely leafy. Rosette leaves and lower stem leaves oblanceolate to narrowly elliptic, 5–13 × 1–3 cm, lyrate or runcinately pinnatifid to pinnatisect, glabrous, base attenuate into a ± winged petiole-like portion, margin subentire to sinuate-dentate; lateral lobes 3–6 pairs, opposite to obliquely opposite, ovate, triangular, linear-lanceolate, or falcate, central ones largest and others gradually smaller, lowermost ones usually toothlike; terminal lobe broadly triangular, linear-lanceolate, or narrowly linear, apex obtuse, acute, or long acuminate. Middle and upper stem leaves similar to lower stem leaves or reduced in size and undivided. Synflorescence corymbiform, with few to many capitula. Capitula with 9–12 florets; peduncle usually 0.5–3 cm, very slender. Involucre narrowly cylindric, 7–9 mm, to 1.1 cm in fruit. Phyllaries abaxially glabrous; outer phyllaries triangular to ovate, longest ca. 1 mm, apex obtuse; inner phyllaries 8, adaxially sparsely appressed hairy, midvein subapically mostly somewhat crested or coriaceous, apex acute. Achene brown, fusiform, ca. 3.5 mm, apex strongly attenuate. Pappus white, 5–5.5 mm. Fl. and fr. Jun–Sep.*

*Thickets; 1800–3300 m. W Sichuan (Kangding).*


*Herbs 13–40 cm tall, perennial, ± rosulate. Caudex with residues of old leaf bases. Stem solitary or few, erect to curved-erect, branched from middle third or higher, glabrous. Rosette leaves and lower stem leaves oblanceolate, 5–10 × 1–2.5 cm, undivided or pinnatifid to pinnatisect, margin sharply

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*Grasslands; ca. 1500 m. Chongqing (Chengkou), Henan, Hubei.*


Herbs 15–80 cm tall, perennial, rosulate, with shoot-bearing roots. Caudex with residues of old leaf bases. Stem solitary, erect, branched from middle third or higher, glabrous, distantly leafy. Rosette leaves distinctly dimorphic, to 6–10 × 2(–3) cm, glabrous, base with a sometimes brown lanate petiole-like portion. Early leaves broadly ovate, undivided and coarsely sinuate-dentate to pinnatifid, base contracted into a petiole-like portion; lateral lobes 1–6 pairs, triangular, apex acute; terminal lobe large, apex acute. Later leaves oblanceolate, elliptic, or lanceolate, pinnatifid to pinnatisect, base attenuate to a petiole-like portion; lateral lobes 4–6 pairs, triangular, apex acute; terminal lobe narrowly lanceolate to linear, apex acute. Lower and middle stem leaves few, lanceolate, pinnatisect, similar to latest rosette leaves. Synflorescence laxly corymbiform, with several to many capitula. Capitula with 11–13 florets; peduncle slender to capillaceous, 1.5–12 cm. Involucre narrowly cylindric, 7–8 mm; outer phyllaries ovate, longest ca. 1.5 mm; inner phyllaries 8, adaxially finely appressed pubescent, midvein subapically somewhat crested or tuberculate, margin scariosus, apex acute and white ciliolate. Anther tube green. Style branches yellow upon drying. Achene dark brown, subfusiform to columnar, 3–3.5 mm, ribs finely spicate, apex attenuate. Pappus white, 4.5–5 mm. Fl. and fr. Jul–Aug.

- Grasslands on mountain slopes; 1000–1800 m. W Sichuan (Kangding).

**Youngia terminalis** is only known from two late 19th century gatherings made by Soulé. The original material preserved at B was destroyed during WWII. No other material has been traced so far, and the above description is based on the original description and a photograph and drawings of the original material. It is apparently closely related to *Y. henryi* and perhaps only a form of the latter from shaded moist habitats. See also note under *Y. kangdingensis*.


*Grasslands on mountain slopes; 1500–2000 m. Hubei, Shaanxi, Sichuan.*

**See notes under Youngia terminalis and Y. kangdingensis.**


Herbs 20–50 cm tall, perennial, rosulate. Caudex with residues of old leaf bases. Stem very slender, erect, sparsely branched from middle third or higher, glabrous, almost leafless; branches arculate. Rosette leaves obovate to oblanceolate, to 12 × 3 cm, undivided or lyrate with petiolate, glabrous, base contracted or attenuate into a very long (to 9 cm) inconspicuously winged petiole-like portion, margin entire to coarsely sinuate-dentate; lateral lobes (if present) 1–4 pairs, triangular, small, apex obtuse; terminal lobe orbicular to ovate, base truncate to subasagitate, apex obtuse to acute. Stem leaves few, linear-lanceolate, reduced in size. Synflorescence laxly corymbiform, with few to several capitula. Capitula with 9–14 florets; peduncle usually 0.5–3 cm, very slender, arculate. Involucre narrowly cylindric, 7–9 mm. Phyllaries abaxially glabrous; outer phyllaries ovate, longest 1–2 mm, apex acute to obtuse; inner phyllaries 8, margin white scarious, adaxially glabrous, midvein subapically plane, apex acute to obtuse. Anther tube greenish. Style branches yellow upon drying. Achene pale brown, subfusiform to columnar, 3–3.5 mm, ribs finely spicate, apex attenuate. Pappus white, 4–5 mm. Fl. and fr. Jun–Sep.

- Grasslands; ca. 1500 m. Chongqing (Chengkou), Henan, Hubei.


Herbs 30–110 cm tall, annual to ?perennial. Stems solitary or few, erect, branched usually in apical third, glabrous or sparsely hairy. Basal and lower stem leaves oblanceolate, to 12 × 3 cm, undivided or lyrate with petiolate, glabrous, base contracted or attenuate into a ± unwinged very variable in length (much longer when leaf undivided) petiole-like portion, margin sinuate-dentate; lateral lobes 1–8 pairs, opposite to obliquely opposite, elliptic to ovate, base truncate to attenuate and sometimes petiolulate, apex acute, obtuse, or rounded; terminal lobe elliptic, ovate, or lanceolate, much larger than lateral lobes, apex ± acute. Middle stem leaves similar to lower leaves but smaller and less (or more rarely not) divided, terminal lobe long acuminate; upper stem leaves narrowly elliptic, lanceolate, or linear-lanceolate, reduced in size. Synflorescence paniculiform-corymbiform, with many capitula. Capitula with 11–25 florets; peduncle capillaceous, usually 0.5–2 cm. Involucre narrowly cylindric, 6–7.5 mm. Phyllaries abaxially glabrous; outer phyllaries ovate, longest to 2.5 mm, apex obtuse; inner phyllaries 7 or 8, adaxially sparsely pubescent with appressed hairs, midvein subapically plane, margin white scarious, apex acute to obtuse. Anther tube green. Style branches yellow upon drying. Achene dark brownish purple, fusiform, 2–3 mm, ribs apically finely spicate, apex attenuate. Pappus white, 3–4 mm. Fl. and fr. Apr–Oct.
**Cichorieae**

- Forests, forest margins, wastelands; 400–2300 m. Chongqing, Gansu, Guangdong, Guangxi, ?Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan.

"Crepis? bokiana Diels" (Bot. Jahrb. Syst. 29: 633. 1901) is based on the collection from Nanchuan, Chongqing, Bock & von Rosthorn 1593, which according to Babcock (Univ. Calif. Publ. Bot. 22: 916. 1947), who investigated a corresponding sheet from B, is a mixed gathering of a fragment with leaves and buds of *Youngia heterophylla* and a second completely sterile fragment with a single leaf of an unknown species. The sheet at B was apparently destroyed in 1943 and no other material of this collection is present at O, where the original set of the Bock and Rosthorn material is preserved. Therefore, the name is here treated as a synonym of *Y. heterophylla*. See also note under *Y. rosthornii*.

*Youngia heterophylla* may be confused with leafy-stemmed forms of *Y. japonica* subsp. *longiflora*.

The latter, however, is strictly annual, its stem leaves have rather triangular or rhombic lateral lobes and an acute or shortly acuminate terminal lobe, and the pappus is of a single series of bristles only (vs. several bristles in a second series in *Y. heterophylla*).


多裂黄鹌菜　duo lie huang an cai


Herbs to 1 m tall or more, ± annual. Stem erect, branched above middle, glabrous, leafy. Basal leaves not seen. Lower and middle stem leaves broadly elliptic to ovate in outline, 11–20 × 7–14 cm, bipinnately compound, primary division pinnatisect; lateral lobes 3 or 4 pairs, opposite to obliquely opposite, oblanceolate, elliptic, irregularly elliptic, or lanceolate, to 5 cm, irregularly pinnatifid to pinnatisect, base ± winged petioluluate, apex acute to acuminate; primary terminal lobe similar in shape and size to lateral lobes; secondary lateral lobes few, irregularly ovate, triangular-ovate, or elliptic. Upper stem leaves similar to middle stem leaves but smaller and with narrower lobes or linear-lanceolate, reduced in size, and undivided. Synflorescence paniculiform-corymbiform, with many capitula. Capitula with 15–20 florets; peduncle capillaceous, usually 0.5–3 cm. Involucre cylindric, 5–6 mm. Phyllaries abaxially glabrous; outer phyllaries ovate, longest less than ca. 1 mm, apex acute; inner phyllaries 8, adaxially appressed pubescent, midvein subapically plane, margin narrowly white scarious, apex acute. Achene pale red, finely mottled with yellow, fusiform, ca. 2 mm, ribs apically finely spicate, apex strongly attenuate. Pappus white, ca. 4 mm. Fl. and fr. Jun.–Oct.

- Sandy areas, valleys; 1000–1500 m. Hubei, Zhejiang.


顶四黄鹌菜　ding ao huang an cai

Herbs 12–13 cm tall, perennial, rosulate. Stems several, very slender, arcuate-erect or stoloniform, remotely 2-furcate, densely pubescent with pale brownish hairs especially at bifurcations, almost leafless. Rosette leaves and (if present) first basal leaf oblanceolate, to 10 × 2 cm, lyrate-pinnatifid to lyrate-pinnatipartite, pale ± brownish pubescent especially abaxially on midvein, base attenuate into a short narrowly winged petiole-like portion, margin faintly mucronately sinuate-dentate or entire, apex obtuse; lateral lobes 3–5 pairs, semiorbicular to broadly triangular, ± retorse, gradually diminishing in size toward leaf base, apex rounded and mucronulate; terminal segment ovate to elliptic. Synflorescence of 1–5 ± distant capitula. Capitula with ca. 12 florets; peduncle very slender. Involucre cylindric, 6–7 mm, glabrous. Outer phyllaries pale yellowish, ovate, longest ca. 2 mm, ± fleshy, apex acute to obtuse; inner phyllaries 8, adaxially pubescent with appressed hairs, midvein subapically crested, apex acute and white ciliolate. Anther tube green. Style branches yellow upon drying. Achene dark reddish brown, fusiform, 3–3.5 mm, compressed, ribs spicate apically, apex attenuate. Pappus white, 1.5–2.5 mm, ± deciduous. Fl. and fr. Apr.–May.

- Cultivated land; ca. 2500 m. Yunnan (Dongchuan).

*Youngia bifurcata* is only known from the type collection made by E. E. Maire sometime in the first third of the 20th century.


黄鹌菜　huang an cai

Herbs usually 10–150 cm tall, annual. Stems solitary or few, erect, branched from base, middle, or only apically, glabrous or basally often ± hairy, ± leafy or leafless. Basal leaves ± oblong-lanceolate, to 15(–25) × 4(–6) cm, lyrate-pinnatifid or
pinnatisect, rarely not divided; glabrous or somewhat hairy, base attenuate into a longer or shorter narrowly winged to ± unwinged petiole-like portion, margin sinuate-dentate; lateral lobes few to many, ovate, rhombic, or elliptic, gradually smaller toward leaf base; terminal lobe ovate, ovate-lanceolate, or obovate, much larger than lateral ones, apex rounded to acute. Stem leaves similar to basal leaves, abruptly or gradually reduced to bracts upward on stem. Synflorescence corymbiform to paniculiform-corymbiform, usually with many to numerous capitula. Capitula with 10–20 florets; peduncle capillaceous. Involucre liform-corymbiform, usually with many to numerous capitula.

Mountain slopes, mountain valleys, forests, forest margins, grasslands, moist areas, stream banks, trailsides, road-sides, disturbed places, densely grassy areas by houses or roads, field margins, as a weed in gardens and fields; below 100–4500 m. Anhui, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [present in all easterly and southerly neighboring countries; originating probably from China and introduced pantropically, extending into adjacent subtropical regions].

Youngia lyrata (= Y. pseudosebecesio) and Y. longiflora (= Y. taiwaniana) are treated here as Y. japonica subsp. elstonii and Y. japonica subsp. longiflora, respectively, of a wider Y. japonica, following Babcock and Stebbins (Publ. Carnegie Inst. Washington 484: 97–98. 1937). While Y. japonica subsp. longiflora seems a fairly well-characterized taxon, the delimitation between Y. japonica subsp. japonica and Y. japonica subsp. elstonii appears questionable in view of frequent transitions and a probably scattered distribution pattern.

1a. Involucr 6–7 mm; anther tube more than ca. 3 mm; achene 2–2.5 mm .... 24c. subsp. longiflora
1b. Involucr 4–5.5 mm; anther tube not more than ca. 2 mm; achene 1.5–2 mm.

2a. Stem leaves none, 1, or 2 (rarely) otherwise abruptly reduced to bracts; anther tube usually more than 1.5 mm ...................... 24a. subsp. japonica
2b. Stem leaves several, very gradually reduced upward on stem to bracts; anther tube at most ca. 1 mm ....... 24b. subsp. elstonii

24a. Youngia japonica subsp. japonica

黄鹌菜(原亚种) huang an cai (yuan ya zhong)

Prenanthes japonica Linnaeus, Mant. Pl. 1: 107. 1767; Chondrilla japonica (Linnaeus) Lamarck; C. multiflora (Thunberg) Poiret; Crepis formosana Hayata; C. japonica (Linnaeus) Bentham; C. taquetii (H. Léveillé & Vaniot) H. Léveillé; Lactuca taquetii H. Léveillé & Vaniot; L. taraxacum H. Léveillé & Vaniot; Prenanthes fastigiata Blume; P. multiflora Thunberg; P. striata Blume; Youngia fastigiata (Blume) Candolle; Y. formosana (Hayata) H. Har.; Y. gracilis Miquel; Y. japonica subsp. formosana (Hayata) Kitamura; Y. japonica var. formosana (Hayata) H. L. Li; Y. multiflora (Thunberg) Candolle; Y. napifolia Candolle; Y. poosa Candolle; Y. runcinata Candolle.

Herbs usually 10–90 cm tall. Stems solitary or few, leafless and with only bracts or with 1 or 2(or more) leaves in basal ca. 1/3–(1/2). Basal leaves mostly to 15 × 5 cm. Involucre 4–5 mm. Outer phyllaries less than 1 mm. Anther tube ?usually 1.7–2 mm. Achene 1.5–2 mm. Pappus 2.5–3.5 mm. Fl. and fr. Feb–Dec. 2n = 16*.

Mountain slopes, mountain valleys, forests, forest margins, grasslands, moist areas, stream banks, trailsides, road-sides, disturbed places, as a weed in gardens and fields; below 100–4500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [present in all easterly and southerly neighboring countries; originating probably from China and introduced pantropically, extending into adjacent subtropical regions].


卵裂黄鹌菜 lu an lie huang an cai

Crepis japonica var. elstonii Hochreutiner, Candollea 5: 340. 1934; Chondrilla lyrata (Thunberg) Poiret; Crepis lyrata (Thunberg) Bentham ex C. B. Clarke (1876), not (Linnaeus) Froelich (1838); Ixeris lyrata (Thunberg) Miqel; Lactuca pseudosebecesio Vaniot; Prenanthes lyrata Thunberg; Youngia lyrata (Thunberg) Cassini; Y. pseudosebecesio (Vaniot) C. Shih.

Herbs usually 0.5–1.5 m tall. Stem mostly solitary, mostly with well-developed leaves at least in lower half. Basal and lower stem leaves to 27 × 7 cm, pinnatifid or sublyrately pinnatifid; lateral lobes 3–7-paired, remote, elliptic to triangular, gradually smaller toward leaf base, lowermost segment usually toothlike, apex acute to obtuse; terminal lobe elliptic, apex acute. Middle and upper stems leaves similar to lower ones but gradually smaller and less divided upward on stem, gradually reduced to bracts. Capitula with ca. 20 florets. Involucre cylindric, 4–5.5 mm. Outer phyllaries less than 1 mm. Anther tube usually 0.6–1 mm. Achene 1.7–2 mm. Pappus 3–3.5 mm. Fl. and fr. Apr–Nov.

Grasslands on mountain slopes, moist areas by water, densely grassy areas by houses, ravines; 300–2500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Yunnan.


长花黄鹌菜 chang hua huang an cai

Crepis japonica subsp. longiflora (Babcock & Stebbins) Handel-Mazzetti; Youngia longiflora (Babcock & Stebbins) C. Shih; Y. taiwaniana S. S. Ying.

Herbs usually 30–90 cm tall. Stems solitary or few, leafless or leafy. Basal leaves to 23 × 7 cm, lyrately pinnatifid, lyrately pinnatifid, inconspicuously runcinate-pinnatifid, or runcinate-pinnatifid; lateral lobes 3–8 pairs, opposite to obliquely opposite, elliptic, triangular, or rhombic, gradually smaller toward leaf base, apex rounded, obtuse, or acute; termi-
nal lobe elliptic to ovate, apex rounded. Stem leaves absent or to basal leaves but gradually smaller and less divided upward on stem. Capitula with 15–20 florets. Involucre cylindrical, 6–7 mm. Phyllaries in 4 rows, abaxially glabrous; outer phyllaries to 1.5 mm. Anther tube usually 3?–4 mm. Achene usually dark purple brown, 2–2.5 mm. Pappus ca. 3.5 mm. Fl.

- Mountain slopes, field margins, stream banks, densely grassy areas by roads; below 100–3100 m. Anhui, Chongqing, Fujian, Guizhou, Guangdong, Guangxi, ?Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Zhejiang.


Herbs 20–50 cm tall, annual. Stem erect, subdivaricately branched from near base; branches closely and nearly regularly spaced, sparsely pubescent or glabrous. Basal leaves oblanceolate, to 8 × 3 cm, lyrate, pinnatisect, glabrous or pubescent with multicellular hairs, base attenuate into a petiole-like portion, margin sinuate-dentate; lateral lobes (1 or)2 or 3 pairs, elliptic to narrowly elliptic, upper lobe largest, apex acute; terminal lobe to columnar, 2–3 mm, apex slightly attenuate. Pappus yellowish yellow upon drying. Achene dark purplish brown, subfusiform, ca. 6–7 mm. Phyllaries abaxially glabrous; outer phyllaries ovate, less than 1 mm, apex acute; inner phyllaries ca. 8, adaxially pressed pubescent, midvein subapically plane, margin narrowly white scarious, apex ± acute. Anther tube green. Style branches yellow upon drying. Achene red, broadly fusiform, ca. 2 mm, subcompressed, ribs obscurely spicate, apex attenuate into a stout 0.2–0.4 mm beak. Pappus white, 3–4 mm, ± caducous. Fl. and fr. Jun–Nov.

- Forests, forest margins, under rocks, earthen walls; ca. 600 m. Guizhou, Hunan, Sichuan.

See note under Youngia erythrocarpa above.


Herbs 15–40 cm tall, perennial, rosetulate. Cauld brown lanate, with residues of old leaf bases. Stems solitary or few, slender, erect, branched from base or higher, leafless or only with bracts. Rosette leaves oblanceolate, to 20 × 7 cm, lyrate, pinnatifidolate, pinnatipartite, or pinnatisect, both faces pubescent with brown multicellular crinkled hairs, base attenuate into a petiole-like portion, margin mucronately sinuate-dentate; lateral lobes 5–8 pairs, opposite or alternate, semiorbicular, elliptic, or triangular, gradually smaller toward leaf base, apex obtuse to rounded; terminal lobe ovate, 5–10 cm, much larger than lateral lobes, shallowly lobed, apex rounded. Synflorescence paniculiform-corymbiform, with numerous capitula. Capitula with ca. 5 florets; peduncle very slender. Involucre cylindrical, 6–7 mm. Phyllaries abaxially glabrous; outer phyllaries ovate to lanceolate, longest ca. 1.5 mm, apex ± acute; inner phyllaries 5, adaxially glabrous, apex obtuse. Anther tube and style branches yellow upon drying. Achene dark purplish brown, subsessiform to columnar, 2–3 mm, apex slightly attenuate. Pappus yellowish brown, 3–4 mm. Fl. and fr. Jun–Jul.

- Trailsides on mountain slopes; 900–1700 m. Sichuan.


Herbs 20–50 cm tall, annual. Stem erect, subdivaricately branched from near base, with multicellular hairs below but glabrescent or glabrous above. Basal leaves oblanceolate, 5–10 × 1.5–3.5 cm, lyrate, pinnatipartite to pinnatisect, both faces glabrous or ± pubescent with multicellular hairs, base attenuate into a petiole-like portion, margin sinuate-dentate; lateral lobes 2 or 3 pairs, elliptic to narrowly elliptic; terminal lobe triangular, apex acuminate. Lower and middle stem leaves similar to basal leaves; upper stem leaves ± linear, reduced in size, undivided or acutely 2-lobed near base. Synflorescence paniculiform-corymbiform, with several to many capitula. Capitula with 13–15 florets; peduncle capilaceous. Involucre cylindrical, 6–7 mm. Phyllaries abaxially glabrous; outer phyllaries ovate, less than 1 mm, apex acute; inner phyllaries ca. 8, adaxially pressed pubescent, midvein subapically plane, margin narrowly white scarious, apex ± acute. Anther tube green. Style branches yellow upon drying. Achene red, broadly fusiform, ca. 2 mm, subcompressed, ribs obscurely spicate, apex attenuate into a stout 0.2–0.4 mm beak. Pappus white, 3–4 mm, ± caducous. Fl. and fr. Jun–Nov.

- Densely grassy areas on mountain slopes, wastelands on plains or in ravines; 400–1900 m. Anhui, Chongqing, Fujian, Guizhou, Guangdong, Guangxi, ?Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Zhejiang.

201. 1933, not R. E. Fries (1928); Hieracium runcinatifolium (E. S. Söderberg) S. Y. Hu, Quart. J. Taiwan Mus. 22: 37. 1969.

少花黄鹌菜 shao hua huang an cai


Herbs 15–40 cm tall, perennial, rosetulate. Cauld brown lanate, with residues of old leaf bases. Stems solitary or few, slender, erect, branched from base or higher, leafless or only with bracts. Rosette leaves oblanceolate, to 20 × 7 cm, lyrate, pinnatifidolate, pinnatipartite, or pinnatisect, both faces pubescent with brown multicellular crinkled hairs, base attenuate into a petiole-like portion, margin mucronately sinuate-dentate; lateral lobes 5–8 pairs, opposite or alternate, semiorbicular, elliptic, or triangular, gradually smaller toward leaf base, apex obtuse to rounded; terminal lobe ovate, 5–10 cm, much larger than lateral lobes, shallowly lobed, apex rounded. Synflorescence paniculiform-corymbiform, with numerous capitula. Capitula with ca. 5 florets; peduncle very slender. Involucre cylindrical, 6–7 mm. Phyllaries abaxially glabrous; outer phyllaries ovate to lanceolate, longest ca. 1.5 mm, apex ± acute; inner phyllaries 5, adaxially glabrous, apex obtuse. Anther tube and style branches yellow upon drying. Achene dark purplish brown, subsessiform to columnar, 2–3 mm, apex slightly attenuate. Pappus yellowish brown, 3–4 mm. Fl. and fr. Jun–Jul.

- Densely grassy areas on mountain slopes, wastelands on plains or in ravines; 400–1900 m. Anhui, Chongqing, Fujian, Guizhou, Hubei, ?Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Zhejiang.

Distinction between Youngia erythrocarpa and the following species, Y. rubida, appears problematic, and their delimitation should be reassessed.


总序黄鹌菜 zong xu huang an cai

川黔黄鹌菜 chuan qian huang an cai

Herbs 20–50 cm tall, annual. Stem erect, subdivaricately branched from near base, with multicellular hairs below but glabrescent or glabrous above. Basal leaves oblanceolate, 5–10 × 1.5–3.5 cm, lyrate, pinnatipartite to pinnatisect, both faces glabrous or ± pubescent with multicellular hairs, base attenuate into a petiole-like portion, margin sinuate-dentate; lateral lobes 2 or 3 pairs, elliptic to narrowly elliptic; terminal lobe triangular, apex acuminate. Lower and middle stem leaves similar to basal leaves; upper stem leaves ± linear, reduced in size, undivided or acutely 2-lobed near base. Synflorescence paniculiform-corymbiform, with several to many capitula. Capitula with 13–15 florets; peduncle capilaceous. Involucre cylindrical, 6–7 mm. Phyllaries abaxially glabrous; outer phyllaries ovate, less than 1 mm, apex acute; inner phyllaries ca. 8, adaxially pressed pubescent, midvein subapically plane, margin narrowly white scarious, apex ± acute. Anther tube green. Style branches yellow upon drying. Achene red, broadly fusiform, ca. 2 mm, subcompressed, ribs obscurely spicate, apex attenuate into a stout 0.2–0.4 mm beak. Pappus white, 3–4 mm, ± caducous. Fl. and fr. Jun–Nov.

- Densely grassy areas on mountain slopes, wastelands on plains or in ravines; 400–1900 m. Anhui, Chongqing, Fujian, Guizhou, Hubei, ?Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Zhejiang.
Lapsanastrum J. D. Hooker, Fl. Brit. India 3: 397. 1881; C. rapunculoides Dunn; Faberia racemifera (J. D. Hooker) Sennikov; Hieracoidoea racemifera (J. D. Hooker) Kuntze.

Herbs 20–70 cm tall, perennial, with a rhizome or shoot-bearing roots. Stem solitary, erect, unbranched or with simple branches from ca. middle third, glabrous, usually leafy. Basal and lower stem leaves ovate, triangular-ovate, or lanceolate, 5–15 × 1–5 cm, glabrous, base attenuate or contracted into a 3–9 cm, broadly and long or narrowly and short cuneately winged petiole-like portion, margin ± mucronately sinuate-dentate, apex acute to acuminate. Middle and upper stem leaves narrowly ovate, lanceolate, or linear-lanceolate, gradually smaller upward on stem, base attenuate into a gradually shorter cuneately winged petiole-like portion, apex acuminate to long acuminate, otherwise similar to basal leaves. Synflorescence of stem and branches secondarily racemiform (occasionally of stem narrowly paniculiform), with few to many drooping capitula. Capitula with 10–20 florets; peduncle wiry, usually 0.2–2 cm. Involucre narrowly campanulate, 1–1.3 cm. Phyllaries abaxially usually glabrous; outer phyllaries narrowly triangular to lanceolate, longest 1/4–1/3 as long as inner ones, apex obtuse to acute; inner phyllaries 8–10, midvein of single phyllaries subapically sometimes crested and/or corniculate, apex acute to obtuse and pale brownish ciliolate. Anther tube yellow. Style strongly exserted, greenish black upon drying. Achene brown, ± cylindric, 4–5 mm, with 5 main ribs and 2 or 3 secondary ribs in between but otherwise ± smooth, apex truncate. Pappus yellowish to pale brown, 7–9 mm. Fl. and fr. Aug–Sep.

Grasslands on mountain slopes, forest margins, forests, forest openings, thickets; 2800–4200 m. Sichuan, Xizang, Yunnan [Bhutan, India (Sikkim), Nepal].

Doubts about the placement of this species in Youngia are justified, indeed. We do not agree, however, with its placement in Faberia as proposed by Sennikov and I. D. Illarionova (Komarovia 5: 109. 2008). Its systematic position is currently being investigated (J. W. Zhang et al., in prep.).


稻槎菜属 dao cha cai shu

Shi Zhu (石铸 Shih Chu); Norbert Kilian

Herbs, annual or short-lived perennial, rosetulate. Leaves pinnatifid or pinnatisect. Capitula usually nodding, in fruit with 6–20 florets. Involucre narrowly cylindric at anthesis, broader in fruit, less than 7 mm, glabrous. Outer phyllaries much shorter than inner ones; inner phyllaries linear-lanceolate to lanceolate, of equal length, becoming broader in fruit. Receptacle naked. Florets 20. Involucre narrowly campanulate, 7–9 mm. Fl. and fr. Aug–Sep.


矮小稻槎菜 ai xiao dao cha cai

Prenanthes humilis Thunberg in Murray, Syst. Veg., ed. 14, 715. 1784; Lapsana humilis (Thunberg) Makino; L. masashiensis Hayata; L. parviflora A. Gray; Youngia humilis (Thunberg) Candolle.

Herb 10–50 cm tall, annual to short-lived perennial, rosetulate, with a taproot. Stems few to several, slender, decumbent to ascending, branched in upper part, puberulent or glabrescent, almost leafless. Rosette leaves oblanceolate, 3.5–10–26 × 1–2[–4] cm, lyrately pinnatifid to pinnatisect, base attenuate into petiolo-like basal portion, margin mucronately sinuate-dentate; lateral lobes 2–7 pairs, elliptic to ovate; terminal lobe ovate, irregularly rhombic, or broadly triangular, much larger than lateral ones, apex ± rounded and mucronulate. Stem leaves 1 or 2, similar to rosette leaves. Synflorescence laxly corymbose, with several capitula. Capitula nodding in fruit, with 15–20 florets; peduncle capillaceous, 0.5–4 cm. Involucre cylindric and 3–4 mm at anthesis, ovoid to subhemispheric and 4–5 mm in fruit. Outer phyllaries 3 or 4, triangular-ovate, ca. 1 mm; inner phyllaries 8. Achene brown, 2–3 mm, minutely papillate, without hooked apical projections of main ribs. Fl. and fr. Apr–Jun. 2n = 16.

Fields, wastelands, stream sides; 500–1000 m. Anhui, Fujian, Jiangsu, Zhejiang [Japan, Korea].


台湾稻槎菜 tai wan dao cha cai

Herbs to 10 cm tall, short-lived perennial, rosulate. Taproot with lateral shoot-bearing roots producing secondary leaf rosettes. Stems few, flagelliform, very slender, creeping to 50 cm above ground, sparsely pilose; nodes 5–10 cm apart, with adventitious roots and a single leaf. Flowering stems from rosettes and leaf axils of creeping stems, to 7 cm, very slender, ascending, simple or more rarely 2-parted, ± leafless. Rosette leaves oblanceolate, 4–9 × 1–2 cm, pinnatisect, rachis winged or not, pilose, base attenuate into a petiole-like portion, margin sinuate-dentate; lateral lobes 4–7 pairs, ovate, triangular, or rhombic, gradually smaller toward petiole-like base, apex rounded to acute and mucronulate; terminal lobe broadly ovate to suborbicular, much larger than lateral ones. Leaves of creeping stems similar to rosette leaves. Capitula 1 or 2 per flowering stem, with ca. 10 florets. Involucres cylindric, ca. 7 mm, in fruit ca. 4 mm wide. Outer phyllaries ca. 5, lanceolate, longest ca. 1 mm; inner phyllaries 8. Achene without hooked apical projections of main ribs. Fl. and fr. Jun–Aug. 2

about 15 species: C and E Asia, including N Pacific Bonin (Ogasawara) Islands; nine species (two endemic) in China.

Herbs 5–25 cm tall, annual to biennial, rosulate, with a taproot. Stems several, slender, ascending, branched from basal half or higher up, pubescent or glabrous, distantly leafy. Rosette leaves oblanceolate, 3–15 × 1–2.5 cm, lyrate pinnatisect, base attenuate into a petiole-like portion, margin subentire to mucronately sinuate-dentate; lateral lobes 2 or 3(or 4) pairs, ovate, elliptic, or hemispheric, apex mucronulate; terminal lobe ovate, rhombic, or elliptic, much larger than lateral ones, apex rounded and mucronulate. Stem leaves few, similar to basal leaves. Synflorescence laxly corymbiform to laxly paniculiform-corymbiform, with few to several capitula. Capitula nodding in fruit, with 5–20 florets; peduncle capillaceous, 1.5–5 cm. Involucres cylindric and 5–6 mm at anthesis, cylindric, campanulate, or obovoid and 4–6 mm in fruit. Phyllaries abaxially glabrous; outer phyllaries 3 or 4, ± ovate, longest 1–1.5 mm, apex acute and often purplish tipped; inner phyllaries 5(or 6). Achene straw-colored to yellowish brown, body 4–5 mm, minutely papillose, usually lateral main ribs apically prolonged into (1 or)2 slender hooked 0.2–1 mm appendages or rarely absent. Fl. and fr. Nov–Jun. 2n = 16*.

About 15 species: C and E Asia, including N Pacific Bonin (Ogasawara) Islands; nine species (two endemic) in China.

Herbs 5–10 cm tall, annual, rosulate, glabrous. Stems several, to 15 cm, slender, decumbent, branched in apical half, almost leafless. Rosette leaves oblanceolate, 4–10 × 1–1.5 cm, pinnatisect to lyrate pinnatisect, base attenuate into petiole-like portion, margin sinuate-dentate; lateral lobes 2–4 pairs, triangular to ovate; terminal lobe ovate, much larger than lateral ones, apex ± rounded and mucronulate. Stem leaves 0 or 1, similar to rosette leaves but reduced in size. Synflorescence laxly corymbose, with few to several capitula. Capitula nodding in fruit, with 10–12 florets; peduncle capillaceous, 1.5–5 cm. Involucres cylindric and 5–6 mm at anthesis, cylindric, campanulate, or obovoid and to 6.5 mm in fruit. Outer phyllaries 3 or 4, triangular-ovate, 1–1.5 mm; inner phyllaries 5(or 6). Achene straw-colored to reddish yellow, body ca. 3 mm, minutely papillose, 2–4 main ribs apically prolonged into slender hooked 1.2–2.2 mm appendages. Fl. and fr. Apr.

Herbs 5–10 cm tall, annual, rosulate, glabrous. Stems several, to 15 cm, slender, decumbent, branched in apical half, almost leafless. Rosette leaves oblanceolate, 4–10 × 1–1.5 cm, pinnatisect to lyrate pinnatisect, base attenuate into petiole-like portion, margin sinuate-dentate; lateral lobes 2–4 pairs, triangular to ovate; terminal lobe ovate, much larger than lateral ones, apex ± rounded and mucronulate. Stem leaves 0 or 1, similar to rosette leaves but reduced in size. Synflorescence laxly corymbose, with few to several capitula. Capitula nodding in fruit, with 5–20 florets; peduncle capillaceous, 1.5–5 cm. Involucres cylindric and 5–6 mm at anthesis, cylindric, campanulate, or obovoid and to 6.5 mm in fruit. Outer phyllaries 3 or 4, triangular-ovate, 1–1.5 mm; inner phyllaries 5(or 6). Achene straw-colored to reddish yellow, body ca. 3 mm, minutely papillose, 2–4 main ribs apically prolonged into slender hooked 1.2–2.2 mm appendages. Fl. and fr. Apr.

Herbs 5–10 cm tall, annual, rosulate, glabrous. Stems several, to 15 cm, slender, decumbent, branched in apical half, almost leafless. Rosette leaves oblanceolate, 4–10 × 1–1.5 cm, pinnatisect to lyrate pinnatisect, base attenuate into petiole-like portion, margin sinuate-dentate; lateral lobes 2–4 pairs, triangular to ovate; terminal lobe ovate, much larger than lateral ones, apex ± rounded and mucronulate. Stem leaves 0 or 1, similar to rosette leaves but reduced in size. Synflorescence laxly corymbose, with few to several capitula. Capitula nodding in fruit, with 5–20 florets; peduncle capillaceous, 1.5–5 cm. Involucres cylindric and 5–6 mm at anthesis, cylindric, campanulate, or obovoid and to 6.5 mm in fruit. Outer phyllaries 3 or 4, triangular-ovate, 1–1.5 mm; inner phyllaries 5(or 6). Achene straw-colored to reddish yellow, body ca. 3 mm, minutely papillose, 2–4 main ribs apically prolonged into slender hooked 1.2–2.2 mm appendages. Fl. and fr. Apr.


假还阳参属 jia huan yang shen shu

Shi Zhu (石铸 Shih Chu); Norbert Kilián

Crepidifolium Sennikov; Geblera Kitagawa (1937), not Fischer & C. A. Meyer (1835); Paraixeris Nakai.

Herbs, annual, biennial, or perennial, sometimes subshrubs, often rosulate, with a taproot. Stems usually leafy. Leaves undivided or pinnately lobed; stem leaves often clasping. Capitula with 5–20 florets. Involucres narrowly cylindric. Phyllaries with narrow scarious margin; outer phyllaries few, longest ca. 1/4(–1/2) as long as inner ones; inner phyllaries 5 or 8, linear-lanceolate, equal in length. Receptacle naked. Florets yellow. Achene ± fusiform, slightly compressed, with 5 main ribs alternating with 1 or 2 secondary ribs, usually scabrid or antrorse acute papillae especially toward apex, rarely glabrous or muriculate, apex attenuate or with a beak less than 1/5 or to 1/2 of achene length. Pappus white, scabrid, usually ± caducous.

About 15 species: C and E Asia, including N Pacific Bonin (Ogasawara) Islands; nine species (two endemic) in China.

Crepidiastrum, in the circumscription used here, includes Paraixeris, following the conclusions by Pak and Kawano (Mem. Fac. Sci. Kyoto Univ., Ser. Biol. 15: 29–61. 1992) of their carpological and cytological investigations, which have been corroborated through recent molecular phylogenetic analyses by J. W. Zhang et al. (in prep.). The analyses by J. W. Zhang et al., moreover, revealed that the Youngiae segregate Crepidifolium
is also nested within the *Crepediastrum* clade, thus confirming an earlier assumption by Sennikov (Bot. Zhurn. 82(5): 113–116. 1997), which Sennikov later revised in favor of establishing the separate genus *Crepidifolium* (Sennikov & I. D. Illarionova, Komaroviya 5: 96. 2008). This genus is therefore also treated here as a congener of *Crepediastrum*, extending its geographical range to C Asia. Its basic chromosome number is \( n = 5 \).

1a. Inner phyllaries 5; florets 5 or 6 ........................................................................................................ 5. *C. chelidonifolium*

1b. Inner phyllaries (7 or)8; florets 8–19.

2a. Stem leaves never clasping.

3a. Plant stoloniferous; leaf blade triangular to orbicular .............................................................................. 6. *C. humifusum*

3b. Plant not stoloniferous; leaf blade oblanceolate, elliptic, or lanceolate.

4a. Stems numerous, intricately and divaricately dichotomously branched ............................................. 9. *C. akagii*

4b. Stems 1 or few, paniculately branched.

5a. Involucre 0.8–1.1 cm, 2.5–3.5 mm wide at anthesis (in middle third); anther tube 3.5–5 mm; achene black to blackish. ......................................................................................................... 7. *C. tenuifolium*

5b. Involucre 1–1.4 cm, (3.5–)4–6 mm wide at anthesis (in middle third); anther tube 5–6 mm; achene usually brownish. ........................................................................................................ 8. *C. diversifolium*

2b. At least upper stem leaves conspicuously clasping.

6a. Annual or biennial herbs; achene with a beak 1/5–1/3 as long as achene.

7a. Middle and upper stem leaves broadest in basal third; involucre 4.5–6.5 mm; anther tube and style pure yellow upon drying ................................................................. 1. *C. sonchifolium*

7b. Middle and upper stem leaves broadest in middle third; involucre 6–9 mm; anther tube and style greenish to blackish upon drying ................................................................. 4. *C. denticulatum*

6b. Perennial rosulate herbs with a woody caudex or subshrubs; achene without a beak or with a beak at most 1/5 as long as achene.

8a. Leaves undivided or pinnately lobed, margin entire to shallowly dentate; primary stems decumbent; middle and upper stem leaves obovate, ovate, or lanceolate, apex subacute to rounded ............................................................................................................................................. 2. *C. lanceolatum*

8b. Leaves always undivided, margin entire to denticulate; primary stems ascending-erect; upper stem leaves broadly elliptic to broadly ovate, apex mostly rounded ........................................................................ 3. *C. taiwanianum*


尖裂假还阳参  jian lie jia huan yang shen

Herbs 20–100 cm tall, annual or biennial. Root vertical, with many fibrous rootlets. Stem solitary, erect, branched predominantly in upper half, glabrous or rarely puberulent (subsp. *pubescens*). Leaves glabrous, or rarely puberulent (subsp. *pubescens*). Basal leaves and often lower stem leaves oblanccolate, apex rounded. Middle and upper stem leaves sessile, narrowly ovate, lanceolate, or rarely ± elliptic, base very conspicuously auriculately clasping, auricles ± rounded; blade including auricles pinnatifid, pinnatipartite, or subpinnatisect and often laciniate so. Synflorescences terminating main stem and branches, corymbiform or panuliform, with few to many capitula. Capitula with 12–20 florets; peduncle capillaceous. Involucre 4.5–6.5 mm, narrowly cylindric. Phyllaries abaxially branched, corymbiform or paniculiform, with few to many corymbiform or paniculiform, with few to many capitula. Capitula with 12–20 florets; peduncle capillaceous. Involucre 4.5–6.5 mm, narrowly cylindric. Phyllaries abaxially glabrous; outer phyllaries few, ovate, less than 0.5 mm, apex acute; inner phyllaries ca. (7 or)8, plane or more often weakly to strongly crestet or comiculate below apex. Achene fusiform, 2–4.2 mm including a slender 0.4–1 mm and 1.5–1.3 mm as long as achene. 

<table>
<thead>
<tr>
<th>1a. Stems, branches, and leaves glabrous; achene ribs scabrid especially apically, beak 0.4–1 mm and 1.5–1.3 mm as long as achene</th>
<th>1b. Stems, branches, and leaves puberulent; achene ribs apically strongly muriculate, beak 1.2×1.8 mm and almost 1/2 as long as achene</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1a. subsp. <em>sonchifolium</em></td>
<td>1b. subsp. <em>pubescens</em></td>
<td></td>
</tr>
</tbody>
</table>

**1a. *Crepediastrum sonchifolium* subsp. *sonchifolium***

尖裂假还阳参(原亚种)  jian lie jia huan yang shen (yuan ya zhong)

*Youngia sonchifolia* Maximowicz, Mém. Acad. Imp. Sci. St.-Pétersbourgs Divers Savans 9: 180. 1859; *Crepediastrum sonchifolium* var. *elegans* (Franchet) Sennikov; *Ixeris elegans* (Franchet) C. Shih; *I. sonchifolium* (Maximowicz) C. Shih; *I. denticulata* (Houttuyn) Stebbins subsp. *elegans* (Franchet) Stebbins; *I. denticulata* subsp. *sonchifolium* (Maximowicz) Stebbins; *I. serotina* (Maximowicz) Kitagawa; *I. sonchifolia* (Maximowicz) Hance; *I. sonchifolia* var. *serotina* (Maximowicz) Kitagawa; *Lactuca bungeana* Nakai; *L. denticulata* (Houttuyn) Maximowicz var. *sonchifolia* (Maximowicz) Maximowicz; *L. elegans* Franchet; *L. sonchifolia* (Maximowicz) Debeaux (1876), not Wilkendow (1803); *Paraixeris serotina* (Maximowicz) Tzvelev; *P. sonchifolia* (Maximowicz) Tzvelev; *P. sonchifolia* var. *serotina* (Maximowicz) Kitagawa; *Y. serotina* Maximowicz.

Basal leaves and often lower stem leaves oblanccolate, apex rounded. Middle stem leaves sessile, narrowly ovate, lanceolate, or rarely ± elliptic, 2.5×0.5–3 cm, base very conspicuously auriculately clasping, auricles ± rounded; blade including auricles pinnatifid, pinnatipartite, or subpinnatisect, with short triangular (1–5 mm) to long narrowly triangular or sublinear (to 1.5 cm) acute lateral lobes and a larger acute ter-
minal lobe, margin entire or sharply dentate. Upper stem leaves similar to middle stem leaves but smaller, usually less incised, less dentate, or entire especially in upper part of blade, apex long acuminate. Involucre 4.5–6.5 mm. Inner phyllaries plane or more often weakly to strongly crested or corniculate below apex. Anther tube and style yellow upon drying. Achene reddish brown, 2–3.2 mm including a slender 0.4–1 mm beak. Pappus 2–3 mm. Fl. and fr. Apr–Sep. 2n = 10*.

Grasslands on mountain slopes, thickets, floodplains, rocky stream beds, cliffs, roadsides; below 100–1900 m. Anhui, Chongqing, Gansu, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan [Korea, Mongolia, E Russia].

Stebbins (J. Bot. 75: 43–51. 1937) distinguished Ixeris denticulata subsp. elegans from I. denticulata subsp. sonchifolia by the slightly smaller involucres, distinctly crested or corniculate inner phyllaries, and more finely dentate leaves. In the material studied, this delimitation does not appear to work. Although, for example, the inner phyllaries are strikingly corniculate in the type of Lactuca elegans, there is no discontinuity but a rather continuous variation toward plants with only slightly crested or even plane phyllaries. Similar observations regard the other features listed.

1b. Crepidiastrum sonchifolium subsp. pubescens (Stebbins) N. Kilian, comb. nov.

柔毛假还阳参 rou mao jia huan yang shen

Basionym: Ixeris denticulata subsp. pubescens Stebbins, J. Bot. 75: 49. 1937.

Herbs 20–40 cm tall, perennial, rosulate, with a woody caudex or rootstock. Stems several from rosette leaf axils, to 40 cm, decumbent, leafy, each usually producing a secondary leaf rosette at a node in its middle third and with a single or few ± ascending-erect remotely leafy secondary flowering stems. Rosette leaves spatulate to rarely elliptic, 5–15 × 0.5–4.5 cm, usually somewhat fleshy, undivided or more rarely pinnatifid to pinnatisect with ovate to lanceolate lateral lobes, glabrous, base cuneately attenuate, margin entire or shallowly dentate, apex usually rounded. Lower and middle stem leaves similar to rosette leaves but smaller, base semiamplexicaul, apex obtuse to acute. Upper stem leaves obovate to ovate, base auriculately clasping, apex subacute to obtuse. Synflorescence corymbiform, with few to several capitula. Capitula with 8–12 florets; peduncle slender. Involucre narrowly cylindric, 7–9 mm. Phyllaries glabrous; outer phyllaries few, ovate, longest ca. 2 mm, apex ± acute; inner phyllaries 8, apex subacute. Achene brownish, subfusiform, 3–4 mm, scabrid, apically attenuate or with a less than 0.5 mm beak. Pappus white, 3–4 mm. 2n = 10*.

Rocky situations on hillsides in coastal areas. Taiwan [Japan, S Korea].


台湾假还阳参 tai wan jia huan yang shen

Crepediastrum koshunensis (Hayata) Nakai var. taiwanianum (Nakai) Yamamoto; Ixeris taiwaniana (Nakai) Stebbins; Lactuca taiwaniana (Nakai) Makino & Nemoto.

Herbs 20–40 cm tall, perennial, sometimes subshrubs, rosulate, with a woody caudex. Stems several from rosette leaf axils, ascending to erect, branched in apical third or half, leafy; older stems basally woody, developing in middle third a secondary leaf rosette with a single or few ± ascending-erect leafy secondary flowering stems. Rosette leaves spatulate, 4–12 × 1–4 cm, glabrous, base attenuate, margin entire or denticulate, apex rounded. Lower stem leaves similar to rosette leaves but smaller, base semiamplexicaul. Middle and upper stem leaves broadly elliptic to broadly ovate, smaller than lower ones, base auriculately clasping, margin entire or faintly denticulate, apex mostly rounded. Synflorescence corymbiform, with several to many capitula. Capitula with 8–12 florets; peduncle slender. Involucre narrowly cylindric, 6–8 mm. Phyllaries glabrous; outer phyllaries few, ovate, longest ca. 1.5 mm, apex ± acute; inner phyllaries 8, apex subacute. Achene brownish, subfusiform, ca. 4 mm, scabrid, apically attenuate or with a less than 0.5 mm beak. Pappus white, ca. 3 mm. 2n = 10*.

● Littoral areas; near sea level to 200 m. S Taiwan.

Crepediastrum taimanianum is closely related to C. lanceolatum. Closer investigation should show whether its status as a separate species is actually justified.


黄瓜假还阳参 huang gua jia huan yang shen

Herbs 30–120 cm tall, annual or biennial. Root vertical, with many fibrous rootlets. Stem solitary, erect, branched pre-
dominantly in upper half, glabrous. Leaves glabrous. Basal and lower stem leaves mostly withered in fruit, ± petiolate or sessile, usually ob lanceolate, undivided, or pinnately divided. Middle stem leaves sessile, base conspicuously auriculately clasping, auricles usually rounded; blade (including auricles) oblanceolate, obovate, pandurate, or ± elliptic, undivided, or pinnatifid or pinnatipartite, margin entire or dentate, apex rounded, acute, or acuminate. Upper stem leaves similar to middle stem leaves but smaller, usually less incised, less dentate, or entire. Synflorescences terminating main stem and branches, above stem leaves but smaller, usually less incised, less dentate, or rounded, acute, or acuminate. Upper stem leaves similar to mid-corymbiform or paniculiform, with few to many capitula. Capitula with 12–20 florets; peduncle capillaceous. Involucre nar-1/5–1/3 as long as achene. Pappus white, 3–5.5 mm. with 10–15 apically scabrid ribs, apex attenuate into a beak 1/5–1/3 as long as achene. Achene blackish dark brown, narrowly ellipsoid, 2.5–4.5 mm, phyllaries few, ovate, less than 0.5 mm, apex acute; inner phyllaries ca. (7 or)8, midvein subapically plane, crested, or corniculate. Anther tube and style greenish to blackish upon drying. Achene blackish brown, narrowly ellipsoid, 2.5–4.5 mm, with 10–15 apically scabrid ribs, apex attenuate into a beak 1/5–1/3 as long as achene. Pappus white, 3–5.5 mm.

1a. Involucre 6–7(–8) mm; midvein of inner phyllaries crested below apex; achene with 0.4–1 mm beak ca. 1/4–1/3 as long as achene ..... 4c. subsp. ramosissimum

1b. Involucre 7–9 mm; midvein of inner phyllaries plane or crested below apex; achene with 0.2–0.6 mm beak ca. 1/5 as long as achene.

2a. Involucre 7–8 mm; midvein of inner phyllaries plane below apex; achene including beak 2.5–3.5 mm; pappus 3.5–4.5 mm ..................... 4a. subsp. denticulatum

2b. Involucre 8–9 mm; midvein of inner phyllaries crested below apex; achene including beak 3.5–4 mm; pappus 4.5–5.5 mm ..................... 4b. subsp. longiflorum

4a. Crepidiastrum denticulatum subsp. denticulatum

4b. Crepidiastrum denticulatum subsp. longiflorum (Stebbins) N. Kilian, comb. nov.

黄瓜假还阳参 huang gua jia huan yang shen (yuan ye zhao)

Prenanthes denticulata Houttuyn, Nat. Hist. 10: 385. 1779; Chondrilla denticulata (Houttuyn) Poiret; C. hastata (Thunberg) Poiret; Crepidiastrum denticulatum var. cornutum Sennikov; C. denticulatum f. pinnatipartitum (Makino) Sennikov; I. denticulata (Houttuyn) Stebbins; I. denticulata f. pinnatipartita (Makino) Stebbins; Lactuca denticulata (Houttuyn) Maximowicz; L. denticulata [unranked] pinnatipartita Makino; Paraixeris denticulata (Houttuyn) Nakai; P. denticulata f. pinnatipartita (Makino) Nakai; P. denticulata var. pinnatipartita (Makino) Barkalov; P. pinnatipartita (Makino) Tzvelev; Prenanthes hastata Thunberg; Youngia chrysanthaa Maximowicz; Y. denticulata (Houttuyn) Kitamura; Y. denticulata f. pinnatipartita (Makino) Kitamura; Y. hastata (Thunberg) Candolle.

Basal leaves and lower stem leaves ob lanceolate, apex usually rounded. Middle stem leaves sessile, base very conspicuously auriculately clasping, auricles ± rounded; blade (including auricles) oblanceolate, obovate, pandurate, or more rarely ± elliptic, 3–12 × 1–7 cm, undivided, or pinnatifid or pinnatipartite, margin shallowly or more deeply dentate or entire; lateral lobes (if present) 2–4 pairs, opposite to subalternate, triangular-ovate, elliptic, or obovate; terminal lobe triangular-ovate to elliptic, much larger, apex rounded to subacute. Upper stem leaves similar to middle stem leaves but smaller, usually less incised or less dentate or entire. Involucre 7–8 mm. Inner phyllaries usually plane below apex. Achene 2.5–3.5 mm including a 0.2–0.5 mm beak. Pappus 3.5–4.5 mm. Fl. and fr. Aug.–Feb. 2n = 10*.

Forests, forest margins, grasslands, dry slopes, among boulders, cliffs, field margins; below 100–2000 m. Fujian, Guangdong, Jiangxi, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jinlin, Liaoning, Shandong, Shanxi, Shanshi, Yunnan, Zhejiang [Japan, Korea, Mongolia, E Russia, Vietnam].

Based on the treatment by Stebbins (J. Bot. 75: 43–51. 1937) under Ixeris, excluding the misplaced I. denticulata subsp. elegans, I. denticulata subsp. pubescens, and I. denticulata subsp. sonchifolia (see subspecies of Crepidiastrum sonchifolium above), three subspecies are recognized in C. denticulatum. They are not always easily distinguishable and seem linked by transitional populations, but this approach may provide a fairly suitable basis for further, much needed studies.

1a. Involucre 6–7(–8) mm; midvein of inner phyllaries crested below apex; achene with 0.4–1 mm beak ca. 1/4–1/3 as long as achene ...... 4c. subsp. ramosissimum

1b. Involucre 7–9 mm; midvein of inner phyllaries plane or crested below apex; achene with 0.2–0.6 mm beak ca. 1/5 as long as achene.

2a. Involucre 7–8 mm; midvein of inner phyllaries plane below apex; achene including beak 2.5–3.5 mm; pappus 3.5–4.5 mm ..................... 4a. subsp. denticulatum

2b. Involucre 8–9 mm; midvein of inner phyllaries crested below apex; achene including beak 3.5–4 mm; pappus 4.5–5.5 mm ..................... 4b. subsp. longiflorum

4a. Crepidiastrum denticulatum subsp. denticulatum

4b. Crepidiastrum denticulatum subsp. longiflorum (Stebbins) N. Kilian, comb. nov.

长叶假还阳参 chang ye jia huan yang shen


Leaves similar to subsp. denticulatum. Involucre 8–9 mm. Inner phyllaries usually distinctly crested below apex. Achene 3–4 mm including a 0.3–0.6 mm beak. Pappus 4.5–5.5 mm. Fl. and fr. (?Sep–)Jan–Mar.

● Field margins; 400–1000 m. Fujian, Guangdong, Jiangxi.

4c. Crepidiastrum denticulatum subsp. ramosissimum (Bentham) N. Kilian, comb. nov.

枝状假还阳参 zhi zhuan jia huan yang shen

Basionym: Brachyramphus ramosissimus Bentham, London J. Bot. 1: 489. 1842; Ixeris denticulata subsp. ramosissima (Bentham) Stebbins; I. ramosissima (Bentham) A. Gray.

Basal and lower stem leaves spatulate to obovate, to 24 × 7 cm, undivided or pinnatipartite to pinnatisect (often lyrate), base cuneately attenuate into a winged or sometimes unwinged petiole-like portion and semiamplexicaul to somewhat auriculately clasping, margin sinuate-dentate, apex rounded to acute; lateral lobes (if present) 2–5 pairs. Middle and upper stem leaves mostly spatulate but uppermost ones sometimes lanceolate, smaller, undivided or pinnatipartite, base without petiole-like portion but distinctly auriculately clasping, margin subentire to shallowly sinuate-dentate, apex rounded to...
acute. Involucre 6–7–(8) mm. Inner phyllaries usually distinctly
crested below apex. Achenes 2.8–4.5 mm including a beak 1/4–
1/3 as long as achene. Pappus ca. 3 mm. Fl. and fr. Jul.–Nov. 2n
= 10*.

- Dry slopes, among boulders, cliffs, roadsides; 600–2000 m.
Guangdong, Guangxi, Guizhou, Yunnan.

5. Crepidiastrum chelidonifolium (Makino) Pak & Kawano,

少花假还阳参  shao hua jia huan yang shen

*Lactuca chelidonifolia* Makino, Bot. Mag. (Tokyo) 12:
47. 1898 [“chelidonifolia”]; *Ixeris chelidonifolia* (Makino)
Stebbins; *L. senecio* H. Léveillé & Vaniot; *Paraixeris chelidon-
ifolia* (Makino) Nakai; *Youngia chelidonifolia* (Makino) Kita-
mura.

Herbs 10–25–[50] cm tall, annual, glabrous. Stem solitary,
erect, branched from base. Basal leaves withered at anthesis.
Lower and middle stem leaves with a slender petiole often basa-
ally with well-developed dentate or denticulate auricles; leaf blade ±
eelliptic, 2–6–[12] × 0.5–3–[6] cm, irregularly and interrupt-
tedly pinnatisect, rachis wingless; lateral lobes 1–4 pairs,
opposite to alternate, ovate, elliptic, falcate, rhombic, or oblance-
olate, margin sparsely dentate to incised; terminal lobe simi-
lar to lateral ones. Upper stem leaves similar to lower and mid-
dle stem leaves. Synflorescence of main stem and branches co-
rymbiform or paniculiform, with few to many capitula. Capitula
with ca. 5(or 6) florets. Involucre narrowly cylindric, 5–7 mm.
Outer phyllaries few, ovate, longest 0.6–1 mm, apex obtuse to
acute; inner phyllaries 5, apex acute to obtuse. An-
ther tube and style greenish to blackish upon drying. Achene brownish,
fusciform, 2.5–3.5 mm, with 10–15 apically long papillose ribs,
apex attenuate or with a beak to 0.7 mm. Pappus white, 3.5–4.5
mm. Fl. and fr. Sep.–Oct. 2n = 10.

Mountain slopes, ravines, forests, moist cliffs; 1000–1700 m. Hei-
longjiang, Jilin [Japan, Korea, E Russia].

Nov. Regni Veg. 63: 289. 1961), based on a collection from Hei-
longjiang, is here considered as conspecific with *Crepidiastrum
also noted (loc. cit.) that the name “*L saxatilis*” was not validly
published because the alternative name “*Lactuca saxatilis*” was proposed
simultaneously (*Vienna Code*, Art. 34.2). Three later binomials referring
to, and based on, Baranov’s original description, where two gatherings
were cited, were also not validly published, because their authors failed
to indicate a single gathering as the type (Art. 37.1 and 37.2): “*Ixeris
29: 400, 1964), and “*Crepidiastrum saxatile*” (Pak & Kawano, Mem.


心叶假还阳参  xin ye jia huan yang shen

*Lactuca humifusa* Dunn, J. Linn. Soc., Bot. 35: 512. 1903;
*Crepis stolonifera* H. Léveillé; *Ixeris humifusa* (Dunn) Steb-

Herbs 15–40 cm tall, perennial, with long creeping runners
sometimes covering ground. Basal leaves present at anthesis,
with an unwinged sparsely hairy petiole to 13 cm; leaf blade
bovovoid, elliptic, broadly ovoid, or semiorbicular, 5–8 × 4–9
cm, abaxially sparsely hairy, lyrate pinnatisect or pinnatipart-
tate, with 1 or 2(or more?) pairs of lateral lobes and a much
larger terminal lobe or margin coarsely sinuate-dentate, base
cordate to truncate, apex acute. Middle and upper stem leaves
and leaves on runners with unwinged petiole usually as long
as blade or longer; leaf blade broadly ovate, subtriangular, or
semiorbicular, margin coarsely sinuate-dentate, otherwise simi-
lar to basal leaves. Uppermost stem leaves petiolate; leaf blade
lanceolate to polygonal, not divided, base truncate to broadly
cuneate. Synflorescence laxly corymbiform with 2–7 capitula.
Capitula with 10–14 florets; peduncle capillaceous, 1–5 cm.
Involucre cylindric, 8.5–11 mm. Phyllaries abaxially glabrous;
outer phyllaries few, ovate to narrowly ovate, longest 1.5–2
mm, apex acute to obtuse; inner phyllaries 8, apex obtuse. An-
ther tube and style dark. Achene brown, ellipsoid, ca. 3.5 mm,
subcompress, with ca. 10 ribs, apex attenuate into a thick ca.
0.5 mm beak. Pappus white, ca. 4 mm. Fl. and fr. Aug.–Sep.

- Cliffs in shaded and damp valleys; 900–2500 m. E Chongqing
(Wushan), W Hubei (Badong, Shennongjia), ?Sichuan, NE Yunnan.

*Crepidiastrum humifusum* is apparently rare, of scattered distribu-
tion, and still little known. Its placement in *Crepidiastrum*
should be regarded as tentative and needs confirmation by more detailed inves-
tigations.

7. Crepidiastrum tenuifolium (Willdenow) Sennikov, Bot.

细叶假还阳参  xi ye jia huan yang shen

*Crepis tenuifolia* Willdenow, Sp. Pl. 3: 1606. 1803;
*Barkhansea tenuifolia* (Willdenow) Candolle; *Berinia tenuifolia*
(Willdenow) Schultz Bipontinus; *Chondrilla baicalensis* (Lede-
bour) Schultz Bipontinus; *Crepis altaica* (Babcock & Stebbins)
Roldugin; *C. baicalensis* Lebedour; *C. pulcherrima* Fischer ex
Link; *Geblera tenuifolia* (Willdenow) Kitagawa; *Hieraciodes
tenuifolia* (Willdenow) Kuntze; *Logoseris tenuifolia* (Willde-
now) Reichenbach; *Youngia altaica* (Babcock & Stebbins)
Czepekanov; *Y. tenuifolia* (Willdenow) Babcock & Stebbins; *Y.
tenuifolia* subsp. *altaica* Babcock & Stebbins.

Herbs 10–70 cm tall, perennial, rosulate. Taproot strong,
woody. Cauldex woody, branching with age, with residues
of old leaf bases. Stems solitary or few, erect, usually branching
in upper half, leafy; branches ascending-erect. Rosette leaves nu-
ersus; petiole 3–9 cm, adaxially long brown tomentose, base ±
expanded; leaf blade narrowly elliptic, 7–17 × 2–5 cm, pin-
natisect to pinnatipartite; lateral lobes 6–12 pairs, opposite to
alternate, very variable, narrowly elliptic, lanceolate, or linear,
undivided or sparsely divided with linear segments, apex acute;
terminal lobe similar to lateral ones. Stem leaves similar to
rosette leaves but gradually smaller and less or not divided up-
ward on stem. Synflorescence corymbiform or paniculiform-
corymbiform, with some capitula. Capitula with 10–15 florets.
Involucre narrowly cylindric, 8–11 mm. Phyllaries dark green,
abaxially sparsely curled pilose or rarely glabrous, frequently
crested or corniculate below apex, apex acute; outer phyllaries
few, narrowly ovate, longest 1/3–1/2 as long as inner ones, apex
acute; inner phyllaries 8. Achene black to blackish, fusiform, 4–
6 mm, with 10–12 ribs, shortly and rather inconspicuously
scabrid, apex attenuate to weakly beaked. Pappus white, 4–6

Mountain slopes, meadows, floodplains, by water, gravelly areas;
1500–4000 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Xin-
jiang, Xizang [Mongolia, E Russia].

The related species, previously treated as Youngia sereraschanica
(B. Fedtschenko) Babcock & Stebbins (incl. Y. disticta (Popov &
Vvedensky) Babcock & Stebbins), distributed in Kazakhstan, Kyrgyz-
stan, Tajikistan, and Uzbekistan, and distinguished by a pale brownish
pappus and inner phyllaries often with long pale bristles on the midvein,
was also included for Xinjiang by C. H. An (Fl. Xinjiang. 5: 451. 1999),
but this record is presumably erroneous (Sennikov & I. D. Illarinovna,

8. Crepidiastrum diversifolium (Ledebour ex Sprengel) J. W.
Zhang & N. Kilian, comb. nov.

细裂假还阳参 xi lie jia huan yang shen

Basionym: Prenanthes diversifolia Ledebour ex Sprengel,
Syst. Veg. 3: 657. 1826; Crepis tenuifolia Willdenow var. altacica Bongard & C. A. Meyer; Youngia diversifolia (Ledebour ex Sprengel) Ledebour; Y. tenuifolia (Willdenow) Babcock & Stebbins subsp. diversifolia (Ledebour ex Sprengel) Babcock & Stebbins.

Herbs 18–40 cm tall, perennial, rosulate. Taproot strong,
woody. Caudex woody, branching with age, with residues of
old leaf bases. Stems solitary or few, erect, branching from base
or middle, leafy. Rosette leaves petiole; petiole 2–6 cm, long
brown tomentose, base expanded; leaf blade narrowly elliptic,
6–9 × 2–4 cm, pinnatipartite to pinnate; lateral lobes 6–9
pairs, lanceolate to linear, margin entire or with few teeth;
terminal lobe similar to lateral ones. Stem leaves similar to
rosetting leaves but gradually smaller and less or not divided upward
on stem. Synflorescence corymbiform or paniculiform-corym-
iform, with some capitula. Capitula with 10–16 florets. Involucre
hemispheric in fruit. Phyllaries in 2 rows; outer phyllaries 2–5; inner phyllaries lanceolate. Receptacle naked. Flo-


叉枝假还阳参 cha zhi jia huan yang shen

Basionym: Geblera akagii Kitagawa, J. Jap. Bot. 13: 430. 1937; Crepidifolium akagii (Kitagawa) Sennikov; C. tenuicaule
(Babcock & Stebbins) Tzvelev; Crepis tenuifolia Willdenow
subsp. tenuicaulis (Babcock & Stebbins) Handel-Mazzetti;
Youngia akagii (Kitagawa) Kitagawa; ? Y. nansiensis Y. Z. Zhao
& L. Ma; Y. ordosica Y. Z. Zhao & L. Ma; Y. tenuicaulis
(Babcock & Stebbins) Czerepanov; Y. tenuifolia (Willdenow)
Babcock & Stebbins subsp. tenuicaulis Babcock & Stebbins.

Shrubs 10–25 cm tall, cushion-forming, rosulate. Tap-
root woody. Caudex woody, branching with age, densely cov-
ered with residues of old leaf bases. Stems many, slender, rigid,
hardened, erect, repeatedly, dichotomously, intricately, and
divarically branched almost from base, glabrous. Rosette leaves
oblanceolate to narrowly elliptic, 2–8 × 0.5–3 cm, glabrous,
pinnatifid to pinnatisect, basally attenuate; lateral lobes 5 or 6
pairs, broadly triangular toothlike to narrowly linear, unequal
in length, margin entire, apex acute. Stem leaves few, much
smaller, otherwise similar to basal leaves or linear to linear-sub-
ulate, reduced in size, undivided, and often bractlike. Synflo-
rescence of each stem divaricately corymbiform, with some capit-
ula. Capitula with 10–12 florets. Involucrre narrowly cylindric,
8–9 mm. Phyllaries dark green, abaxially glabrous to slightly
puberulent, frequently crested or corniculate below apex; outer
phyllaries few, narrowly ovate to lanceolate, longest ca. 2 mm,
apex acute; inner phyllaries 8, apex ± obtuse. Achene black to
blackish, fusiform, 3.5–5.5 mm, with 10 ribs, shortly scabrid,
apex attenuate. Pappus white, 4–6 mm, caducous. Fl. and fr.
Jul–Sep. 2n = 42.

Grasslands on mountain slopes, gravelly areas; 1400–4900 m.
Gansu, Hebei, Nei Mongol, Xinjiang [Mongolia, E Russia].

Crepidiastrum akagii is superficially similar to and sometimes
confused with Askellia flexuosa; for their distinction see there (p. 327).
Crepidiastrum akagii is closely related to C. tenuifolium and C. diversi-
folium and, as was already assumed by Babcock and Stebbins (Publ.
Carnegie Inst. Washington 484: 52. 1937), a “polyploid apomict.” No
material has been seen of Youngia nansiensis, which was provided by
its authors with a very poor description and said to be glabrous but oth-
erwise similar to C. akagii (Y. Z. Zhao & L. Ma, Bull. Bot. Res., Harbin
24: 133. 2004); it is provisionally sunk in the synonymy of the latter.
The largely neglected Y. alashanica H. C. Fu (in Ma, Fl. Intramongol.,
ed. 2, 4: 849. 1993), said to have affinities to C. akagii as well, in con-
trast, is certainly completely unrelated and actually represents with high
probability Launaea procumbens (see there, p. 239).


异喙菊属 yi hui ju shu

Shi Zhu (石铸 Shih Chu); Norbert Kilian

Herbs, annual. Stem leaves sagittately clasping. Capitula solitary or few, terminal on or in axils of branches, with numerous
florets. Involucre hemispheric in fruit. Phyllaries in 2 rows; outer phyllaries 2–5; inner phyllaries lanceolate. Receptacle naked. Flo-
rets yellow. Achene dimorphic; outer achenes with short stout beak; inner achenes with a long slender beak. Pappus absent in outer achenes and mostly present in inner achenes, white, of scabrid bristles.

One species: C and SW Asia, SE Europe.


异喙菊  yì huì ju

*Heteracia epapposa* (Regel & Schmalhausen) Popov; *H. szovitsii* var. *epapposa* Regel & Schmalhausen.

Herbs 5–30(–40) cm tall, annual. Taproot slender. Stem erect to ascending, sparsely furcately branched from base, glabrous. Basal leaves narrowly elliptic, obovate, or narrowly spatulate, 3–8 × 0.5–1.5 cm, undivided or shallowly pinnatifid to pinnatisect, glabrous, base attenuate, margin entire or sinuately dentate, apex rounded to acute; lateral lobes (if present) triangular to narrowly elliptic, unequal. Stem leaves narrowly ovate to lanceolate, 3–7 × 0.5–1.5 cm, base sagittately clasping, otherwise similar to basal leaves. Capitula solitary or few, terminal or in axils of branches, sessile or on a distally somewhat thickened peduncle to usually ca. 4 cm at fruiting, with 20–50 florets. Involucre stout cylindric and 4–6 × 4–5 mm at anthesis, flat hemispheric and 5–10 mm in diam. in fruit. Outer phyllaries 2–5, triangular, 1–2 mm, subequal; inner phyllaries lanceolate, ca. 8, subequal. Achene with body 3–4 mm, of 2 kinds; outer achenes grayish brown, broadly obconical, compressed, with 5 ± rugose ribs, lateral ribs strongly winglike and enlarged, with a stout to slender 0.8–1.8 mm beak; inner achenes slenderly obconical, with 5 unequal, apically acute verruciform or scaly ribs, with a filiform beak to 8–10 mm strongly exceeding involucre. Pappus absent in outer achenes, mostly present or more rarely absent in inner achenes, white, 3–5 mm. Fl. and fr. Apr–Jun. 2n = 8.

Deserts or semideserts; 800–1000 m. Xinjiang [Kazakhstan, Kyrgyzstan, Russia (E European part), Tajikistan, Turkmenistan, Uzbekistan; SW Asia].


小疮菊属  xiāo chuāng jú shù

*Shi Zhu* (石铸 Shih Chu); Norbert Kilian

Herbs, mostly rosulate, undivided to pinnatisect. Capitula few to many, cymose on stout branches. Involucre campanulate. Phyllaries in 2 rows; outer phyllaries inconspicuous; inner phyllaries linear-lanceolate, hardened, thickened in fruit. Receptacle naked. Florets yellow. Achene columnar, ± incurved, minutely hairy; outer achenes apically attenuate and partly enclosed by inner hardened phyllaries; inner achenes attenuate into a long slender beak. Pappus white, of scabrid bristles to 1.5 mm.

Four species: C and SW Asia; one species in China.


小疮菊  xiāo chuāng jú

*Rhagadiolus papposus* (Boissier & Buhse) Kuntze.

Herbs 5–20(–40) cm tall, annual. Taproot slender. Stem erect, branched from base or basally, white pubescent and sometimes also with subulate stiff bristles. Basal leaves oblan- ceolate, narrowly elliptic-oblanceolate, or elliptic, 2–15 × 0.5–5 cm, lyrate pinnatifid to pinnatisect, base attenuate, margin ± dentate; lateral lobes 2–5-paired, lowest ones small and toothlike, upper ones large and triangular to elliptic; terminal lobe triangular to elliptic, apex obtuse, acute, or rounded. Stem leaves few, similar to basal leaves or narrowly elliptic and divided or not. Capitula usually a few densely aggregated at nodes of branches, with 6–10 florets. Involucre stoutly cylindric and 4–5 × 3–4 mm at anthesis, 6–9 mm in fruit. Outer phyllaries few, inconspicuous; inner phyllaries linear-lanceolate, abaxially with rigid subulate bristles or rarely glabrous, hardened, carinate and incurved in fruit, partly enclosing outer achenes. Achene columnar, curved, with appressed hairs; outer achenes 4–5 mm, apically attenuate; inner achenes 7–10 mm, strongly exceeding involucre, apically attenuate into a long slender beak. Pappus of white, smooth to scabrid bristles of 0.2–1.5 mm, shorter in outer achenes, longer in inner achenes. Fl. and fr. Apr–Jun.

Plains, low mountain regions; above 600 m. Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].


蒲公英属  pú gōng yīng shù

Ge Xuejun (葛学军); Jan Kirschner, Jan Štěpánek

Herbs, rosulate, perennial, with a taproot, root head sometimes with a tunic (covered with dry brown remnants of petioles from previous years). Stems 1 to sometimes several, hollow, leafless (scape), unbranched, rarely with 1–3 branches. Plant indumentum consisting of arachnoid hairs; leaf and scape hairs sometimes on low protuberances or ridges; hairs on floret tube often straight and simple. Leaves entire or variously lobed, runcinate to pinnatisect. Capitulum pointing upward or downward after anthesis. Involucre with two distinct series of phyllaries. Some of phyllaries often corniculate or horned at apex; outer phyllaries variable in length and
shape (imbricate) or almost uniform (not imbricate), usually substantially shorter than inner ones, appressed to reflexed, glabrous to ciliate or with arachnoid surfaces, unbordered to variously pale to whitish bordered. Receptacle naked, glabrous or sparsely arachnoid. Florets yellow, white, whitish yellow, pale or deep pink, orange, brownish orange, or reddish brown; ligules flat, involute, or tubular, adaxial epidermal cell cuticle ± domed and transversely striate. Achene whitish, straw-brown, ochraceous, reddish, reddish brown, deep brown, or black, usually composed of a body, which includes a narrowed but equally colored cone, and apically with a beak but cone sometimes indistinct or not developed; body spinulose and/or squamulose in upper part (below cone), often tuberculate below or completely or almost smooth, or spinulose and tuberculate throughout, abruptly or gradually narrowing into cone (when cone developed); beak usually longer than achene body including cone or short, sometimes not developed at all, thin or thick. Pappus with numerous scabrid bristles, white, yellowish, or light reddish brown. Plants with agamospermous reproduction or sexual, self-incompatible or rarely self-compatible. Chromosome base number $x = 8$ (diploids to dodecaploids). Diploids always sexual, tetraploids usually agamospermous [three tetraploid sexual species known in *Taraxacum* sect. *Ptesis*], other polyploids agamospermous.

More than 2,500 species: mainly in the Arctic and temperate zones of the N Hemisphere with main diversity in mountains of Eurasia, a few species in temperate regions of the S Hemisphere; 116 species (81 endemic, three introduced) in China.

The genus *Taraxacum* represents a taxonomic complexity in the whole of its range and in China in particular. Basic features of dandelions relevant for the taxonomy at the species level are: 1) There is a low level of structural morphological differentiation. 2) There is a coexistence of agamospermy and sexuality. 3) There is complex hybridity. 4) There is extensive polyploidy. 5) There is a large number of taxa. Thus, any taxonomic study of this genus should follow a few principles: 1) A great attention should be paid to the reproduction in population structures because different modes of reproduction usually mean very different variation ranges, and species in *Taraxacum* differ substantially in this respect. 2) The taxonomic study must be started at the lowest level of recognizable units in order to avoid a loss of information, and later lumping should be a result of a knowledge of the population structure of all subordinate units. 3) The category of section is equally important as that of species in *Taraxacum*. Because of very different reproduction systems, the species have incommensurable variation ranges, and, for a non-specialist in particular, the most useful traditional rank covering both sexual and agamospermous taxa is that of section. Moreover, in an imperfectly explored region, there might be sections in which the species remain unknown or undescribed because of the insufficient material, although the very occurrence of the given section in the territory studied is unquestionable. The latter case requires using sections as one of the basic categories in taxonomic hierarchy.

Notes on descriptions: Achenes are measured to include the cone, a narrow part of the achene connecting achene body with the beak. Middle leaves are those well developed during full anthesis; outer leaves are the first spring leaves and are usually less deeply lobed or not divided. Inner leaves develop at the end of anthesis and are usually more deeply divided than the others. In the descriptions, middle leaves are taxonomically the most important. Outer phyllaries are described as imbricate when the outermost ones of them are broader and shorter than the successive more inner ones (often the outermost ones are ovate to ovate-lanceolate and the others lanceolate to narrowly lanceolate; the distal parts of the latter are clearly visible above the outermost ones). In species with imbricate outer phyllaries, the bracket measurements usually refer to the innermost outer phyllaries (the longest and the narrowest ones).

In several Chinese *Taraxacum* sections achene color substantially changes before maturity. Particularly in *T*. sect. *Tibetana* and *T*. sect. *Emodensis*, two color series can be recognized: in one series achenes are pale reddish ochraceous or ochraceous when immature and become darker red to reach deep reddish castaneous brown or deep red when mature, and the other series starts with pale grayish or straw-colored achenes, becoming gray and reaching almost black at full maturity.

Variation is also observed in the development of a horn on the outer phyllaries. The first capitula to blossom often have flat or callose outer and/or inner phyllaries while later capitula have a distinct horn near the apex of the phyllaries. This characteristic mainly concerns *Taraxacum* sect. *Borealia*, *T*. sect. *Emodensis*, and *T*. sect. *Mongolica*.

The references to Higher Pl. China in the following treatment of *Taraxacum* refers to the treatment of *Taraxacum* by X. J. Ge (11: 766–786. 2005).

1a. Achene smooth or with very sparse spinules or tubercles above, spinules minute.

2a. Achene cone subcylindric and clearly developed .......................................................... 15. *T*. sect. *Glabra* (p. 316) 2b. Achene cone not developed at all or broadly conic and forming a gradual transition from achene body to beak.

3a. Outer phyllaries sparsely to densely arachnoid on abaxial and/or adaxial surfaces; outer phyllary margin densely to sparsely arachnoid; achene usually 5–6.5 mm; beak not fragile, usually almost as thick as achene body; pappus easily breaking off ......................................................... 4. *T*. sect. *Oligantha* (p. 280)

3b. Outer phyllaries glabrous on both surfaces; outer phyllary margin glabrous or subglabrous; achene usually 4–5 mm; beak fragile, thick or slightly thickened but narrower than achene body; pappus not easily breaking off .............................................................. 13. *T*. sect. *Atrata* (p. 314)

1b. Achene sparsely to densely spinulose and/or squamulose above, spinules evident and not minute.

4a. Most of outer phyllaries patent, aruncate-patent, recurved, or reflexed.

5a. Achene red, reddish brown, or deep brown.


5b. Achene light grayish straw-colored brown, light olivaceous brown, yellowish, or pale ochraceous.
7a. Near apex of outer phyllaries flat, calllose, or minutely corniculate (check later flowering capitula).
8a. Outer phyllaries 3–5 mm wide and leaves subprostrate to erect-patent and not subleathery ... 10. T. sect. *Qaisera* (p. 303)
8b. Outer phyllaries usually 1.5–3 mm wide, or if broader then leaves erect and subleathery.
9a. Leaves erect, subleathery; achene (4–)5–6.1 mm; cone subcylindric, 1–2.2 mm ...................... 9. T. sect. *Turrita* (p. 301)
9b. Leaves erect-patent to subprostrate, not subleathery; achene 3–4.5 mm; cone conic to subcylindric, 0.2–0.9 mm ................................................................................................................. 23. T. sect. *Taraxacum* (p. 324)
7b. Near apex of outer phyllaries (check later flowering capitula) or sometimes only inner phyllaries with a conspicuous horn.
10b. Ligules deep yellow; outer phyllaries to 25.

11a. Outer phyllaries 15–25, 6–13 mm; leaves subleathery; achene 4–6.1 mm ......................... 9. T. sect. *Turrita* (p. 301)
11b. Outer phyllaries less than 15, to 6 mm; leaves not subleathery; achene 3–4 mm .... 12. T. sect. *Macrocornuta* (p. 313)

4b. Outer phyllaries appressed, loosely appressed, or erect, a minority of them may be erect-patent.

12a. Outer phyllaries or sometimes only inner ones or both with conspicuous horns.
13a. Achene body 1.1–2 mm wide when mature.
13a. Outer phyllaries not distinctly veined; achene spinulose and/or tuberculate in upper 1/4–1/2 but otherwise ± smooth ................................................................. 7. T. sect. *Emodensia* (p. 291)
14b. Outer phyllaries with distinct venation; achene usually squamulose or spinulose and tuberculate throughout ................................................................. 8. T. sect. *Mongolica* (p. 296)
13b. Achene body 0.7–1.1 mm wide when mature.
15a. Achene cone broadly conic to subconic; achene body abruptly to subabruptly narrowing into cone; scapes usually growing from lateral side to leaf rosette ........................................... 16. T. sect. *Borealia* (p. 317)
15b. Achene cone cylindric to subcylindric; achene body gradually to subgradually narrowing into cone; scapes growing from center of leaf rosette.

16a. Outer phyllaries 13–24; leaves deeply dissected or pinnatisect, lateral lobes linear, linear-triangular, or rarely to narrowly triangular ................................................................. 3. T. sect. *Stenoloba* (p. 278)
16b. Outer phyllaries 8–14; leaves shallowly pinnatifid to pinnatifid, lateral lobes broadly triangular, deltoid, or broadly deltoid-triangular .................................................. 11. T. sect. *Ceratoidea* (p. 312)
12b. Outer phyllaries flat, callose, or minutely corniculate.
17a. Outer phyllaries 3.5–8 mm wide.
18a. Outer phyllaries 6–17 mm.

19a. Outer phyllaries corniculate near apex; achene cone usually 0.8–1.4 mm; scapes densely arachnoid ............................................................................................................... 5. T. sect. *Calanthodia* (p. 281)
19b. Outer phyllaries flat near apex; achene cone usually 0.4–0.8 mm; scapes sparsely arachnoid to subglabrous or densely arachnoid ................................................................. 10. T. sect. *Qaisera* (p. 303)
18b. Outer phyllaries 3–6 mm.
20a. Achene cone conic, 0.5–0.6 mm; achene body ± gradually narrowing into cone .............. 14. T. sect. *Arctica* (p. 316)
20b. Achene cone ± cylindric, 0.6–0.8 mm; achene body subabruptly narrowing into cone .... 21. T. sect. *Dissecta* (p. 323)
17b. Outer phyllaries 1–3.5 mm wide.
21a. Outer phyllaries light glaucous-green to light green, dark color confined to a narrow middle strip, flat near apex ................................................................. 17. T. sect. *Parvula* (p. 318)
21b. Outer phyllaries blackish, blackish green, dark green, or deep green, if light green then corniculate.
22a. Achene light grayish straw-colored brown or light grayish brown.
23a. Achene cone ± conic or subcylindric, 0.4–0.5 mm wide; beak thickened or thin.
24b. Achene body spinules long or short and thinly or shorty subconic, straight, erect-patent to suberect ................................................................. 6. T. sect. *Tibetana* (p. 285)
23b. Achene cone ± cylindric, 0.2–0.3 mm wide; beak thin.
25a. Pappus white to yellowish white; flowering spring to early summer; dry subsaline or steppe to substeppe habitats ........................................................................................................ 3. T. sect. *Stenoloba* (p. 278)
25b. Pappus light pinkish brown; flowering late summer and autumn; wet saline habitats ... 18. T. sect. *Piezis* (p. 320)
22b. Achene reddish, red, dark olivaceous brown, deep brown to blackish brown, or blackish.
26a. Achene cone cylindric, thin; achene 3.2–3.8 mm ............................................................. 21. T. sect. *Dissecta* (p. 323)
26b. Achene cone conic or subconic, if ± cylindric then thick; achene 3.7–5.5 mm.
27a. Achene beak longer than body usually by 1.5 mm or more ......................................... 6. T. sect. *Tibetana* (p. 285)

**垂头蒲公英组 chui tou pu gong ying zu**

<table>
<thead>
<tr>
<th>Subsection</th>
<th>Description</th>
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<tbody>
<tr>
<td>1a.</td>
<td>Pollen absent.</td>
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<tr>
<td>1b.</td>
<td>Pollen present.</td>
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Hairs on scapes and on some leaves often on low protuberances. Capitulum nodding after anthesis. Outer phyllaries very numerous, linear-lanceolate, irregularly recurved, apical part attenuate, apex with a horn; inner phyllaries ≥ equaling outer ones. Florets brownish orange. Stigmas dark blackish violet when dry. Achene pale brown, medium-sized; body ± broad, apically subgradually narrowing into a 0.5–0.8 mm subconic cone; beak 1–1.5 cm. Pappus dirty white to brownish white. Sexual.

- One species: China.

The section was described on the basis of the report of a biennial life cycle in cultivated material. The bienniality of *Taraxacum nutans* is excluded on the basis of the study of plants collected in the wild. They often have a root head with a tuft (see the generic description). Field observations show almost complete absence of sterile leaf rosettes in natural populations (almost all plants flowering), another feature supporting the most common *Taraxacum* pattern.


**白花蒲公英组 bai hua pu gong ying zu**

Leaves and scapes sparsely arachnoid to subglabrous. Capitulum erect after anthesis. Outer phyllaries (9 or)10–16(–19), greenish to dark green, imbricate or sometimes not so, ovate to lanceolate, usually tightly appressed, border paler or reddish and usually broad or less often narrow or absent, usually not coriaceous near apex. Florets white, whitish yellow, pale yellowish (more deeply yellow in center of capitulum), or yellow. Achene pale grayish or brownish straw-colored, subdensely coarsely spinulose with subacute stout spinules often slightly curved upward, apically subgradually to sub abruptly narrowing into a usually subcylindric 0.7–1 × 0.4–0.5 mm cone; beak 5–7 mm, sometimes thick but usually thin. Pappus white or brownish discolored, 5–7 mm.

About 23 species: Afghanistan, China, India, Mongolia, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan; 13 species (four endemic) in China.

Part of the sectional diversity center is in SW China.

In Hebei, Nei Mongol, Shaanxi, and Shanxi sexual representatives of *Taraxacum* sect. *Leucantha* were detected. They are very variable in leaf shape and by their outer phyllary characters belong to the group of *T. sinicum* and *T. dealbatum*. Further research is needed.

*Taraxacum leucanthum* (Ledebour) Ledebour (Fl. Ross. 2: 815. 1846) has been reported as a member of the Chinese flora (FRPS 80(2): 14. 1999; Higher Pl. China 11: 769. 2005). The name usually covers most of the diversity of the whole section in the literature. We failed to find any specimen belonging to this species in the material studied. However, *T. leucanthum* might be found in NW Xinjiang. High mountain plants from Gansu, Qinghai, and Xizang reported in the literature under this name belong to other taxa (in part, probably to *T. candidatum*), but a revision is inevitable.

1a. Pollen absent.

2a. Outer phyllaries evenly black to blackish green, border not developed

2b. Outer phyllaries green to dark green in middle, paler borders developed.

3a. Scapes glabrous; achene cone 1–1.1 mm, beak 5–6 mm

3b. Scapes arachnoid; achene cone 0.7–1 mm, beak 4–5 mm
4a. Pollen grains regular in size (plants sexual) ................................................................. see comment above
4b. Pollen grains irregular in size.
5a. Stigmas yellow or ± yellow.
  6a. Achene beak 2–3 mm, thick ...................................................................................... 8. T. armentifolium
  6b. Achene beak 4–5 mm, thin.
  7a. Achene 3.5–3.9 mm; pappus 4–5 mm ................................................................. 11. T. pseudoleucanthum
  7b. Achene 5.2–5.7 mm; pappus ca. 7 mm ................................................................. 12. T. iliense
5b. Stigmas discolored (grayish, greenish, dark, yellowish green).
  8a. Inner florets involute to subtubular, cream to pale yellowish white .................. 14. T. cereum
  8b. Inner florets canaliculate, all yellow or at least only outer ones white.
9a. All florets yellow.
  10a. Involute base rounded, 7–10 mm wide; outer phyllaries ovate to broadly ovate .......... 9. T. ikonnikovii
  10b. Involute base ± subobconic, 6–8 mm wide; outer phyllaries ovate-lanceolate to lanceolate.
    11a. Leaf lateral lobes linear to linear-triangular, not lingulate; achene 3.5–4.4 mm, 
        cone 0.7–1 mm ...................................................................................... 7. T. sinicum
    11b. Leaf lateral lobes lingulate; achene 4.5–4.8 mm, cone 1.2–1.5 mm ......................... 13. T. patiens
9b. At least outer florets ± white inside.
  12a. Outer phyllaries with dark blackish green middle part, border white and 0.9–1.3 mm wide ........ 3. T. album
  12b. Outer phyllaries with green to dark middle part, border whitish and 0.5–1 mm wide.
    13a. Pappus ± yellowish white ........................................................................... 5. T. dealbatum
    13b. Pappus conspicuously brownish pinkish white ................................................ 10. T. luridum

2. Taraxacum albiflos Kirschner & Štěpánek, sp. nov.

白花蒲公英 bai hua pu gong ying


Plantae agamospermae foliis linearibus integris vel denticulatis, scapis superne dense araneosis, phyllaris involucralibus extus subrotundis vel ovato-lanceolatis, parte mediana obscure nigrescenti-viridis, marginibus pallidis non evolutis, ligulis extus atro-roseis, interiores pallide lutescentibus, antheris polline carentibus, stigmatibus extus nigricantibus.

Herbs to 10 cm tall, slender, perennial. Leaves mid-green but pale green at base, linear, 5–9 × 0.3–0.4 cm, almost glabrous, margin entire, remotely denticate, or rarely remotely shallowly sublobulate, apex obtuse. Scapes brownish green, to 8 cm, ± equaling leaves, sparsely arachnoid at base but densely arachnoid below capitulum. Capitulum 1.5–3 cm wide. Involucral leaves 6–7 mm wide, base rounded. Outer phyllaries 11–14, black but median part often blackish green, subimbricate, ovate to ovato-lanceolate, 3.5–5.5 × 1.6–2.5 mm, appressed, without a paler border, margin not ciliate, apex acute, pale pinkish, and often with small black horn or ± flat; inner phyllaries blackish, narrowly linear, 0.9–1.2 cm, apex ciliate. Outer ligules white or very pale yellowish white but outside striped blackish pink flat; inner ligules pale yellowish with blackish apical teeth. Anthers without pollen. Stigmas abaxially blackish, adaxially gray, black pubescent. Achene unknown. Agamosperm.

1. Wet subsaline meadows; ca. 3800 m. S Xinjiang.

Herbs 10–14 cm tall. Petiole usually purple, narrowly winged in outer and middle leaves, ± unwinged in inner ones; leaf blade bright green and often with a purplish midvein, ± linear, 7–10 × 0.7–1.2 cm, subglabrous, margin almost entire, dentate, or irregularly lobed; lateral lobes (if present) 3 or 4 pairs, triangular, 3–4 × 3–4 mm, ± patent, blades of inner leaves often deeply dissected into linear to linear-triangular lobes; interlobes short, 3–4 mm wide, margin entire or with minute acute teeth near distal base of lobes; terminal lobe not distinct in middle leaves, to 2 cm in inner leaves, margin usually entire. Scapes brownish green, ± equaling leaves, densely arachnoid below capitulum. Capitulum 2–3 cm wide. Involucre 1–1.2 cm wide, base rounded to slightly truncate. Outer phyllaries 10–13, middle part dark blackish green and 0.6–1.5 mm wide, not imbricate, ovate, outermost ones 6–7.5 × 2.5–3.5 mm and ca. 1/2 as long as inner ones, ± appressed, with a very distinct whitish membranous 0.9–1.3 mm border, margin glabrous to sparsely ciliate at apex, apex distinctly coriaceous; inner phyllaries 1.2–1.4 cm, coriaceous below apex. Ligules outside pure white; outer ligules flat to cucullate, outside striped purplish gray; inner ligules white to slightly pinkish white, with grayish teeth. Stigmas grayish to blackish green. Anthers sparsely polliniferous; pollen grains irregular in size. Achene pale grayish, 3.9–4.2 mm; body apically spinulose and subapically narrowing into a cylindric to subcylindric 0.8–1 mm cone, spinules long and coarse; beak 4–5 mm, thin. Pappus pale yellowish, 6.5–7.5 mm. Fl. summer. Agamosperm.

Wet saline marshes, wet pastures, along rivers; 2000–3000 m. W Xinjiang [Kyrgyzstan].
**Taraxacum album** is a rather marginal species in this section, with some resemblance to species of *T. sect. Suavia*.


雪白蒲公英  xue bai pu gong ying

Herbs 6–13 cm tall. Petiole usually pinkish, long, narrow, unwinged, base sparingly arachnoid; leaf blade dull green, linear, 6–8(–11) × 0.4–0.8(–1) cm, ± glabrous, margin usually shortly remotely lobed or sometimes dentate; lateral lobes 3 or 4 pairs, linear, to 4 mm, patent to bent upward, margin entire; interlobes usually 5–8(–10) × 1(–2) mm, margin entire; terminal lobe linear to linear-lingulate, (4–)6–10(–20) mm, margin entire. Scapes greenish, equaling or slightly overtopping leaves, glabrous or rarely with a few arachnoid hairs. Capitulum 1.5–2 cm wide. Involucre 6–7 mm wide, base ± rounded. Outer phyllaries 12–14, deep green but often suffused pinkish apically, imbricate, outermost ones ovate and 3–4 × 2.2–2.5 mm, middle ones ovate-lanceolate, 5–5.5 × 2–2.3 mm, and 1/3–1/2 as long as inner ones, appressed, with ± distinct whitish 0.3–0.4 mm wide border, margin entire or dentate and usually sparsely ciliate near apex, apex flat; inner phyllaries 9–10 mm, apex flat. Ligules inside pure white; outer ligules almost flat, outside striped grayish pink; inner ligules with white apical teeth. Stigmas green. Anthers without pollen. Achene light grayish straw-colored, 3.8–4.1 × 0.9–1 mm; body with white apical teeth. Stigmas green, ligules almost flat, outside striped grayish pink; inner ligules 9–10 mm, apex flat. Ligules inside pure white; outer ligules almost flat, outside striped grayish pink; inner ligules with white apical teeth. Stigmas grayish green to almost black. Anthers without pollen. Achene light grayish straw-colored, 3.8–4.1 × 0.9–1 mm; body subdensely coarsely spinulose above, ± gradually narrowing into a relatively thick cylindrical 1–1.1 mm cone; beak 5–6 mm, thin. Pappus yellowish white, 4.5–5 mm. Fl. spring to early summer. Agamosperm. 2n = 32.

Subsaline steppe depressions, pastures along rivers; 600–1000 m. Nei Mongol [Russia (Siberia)].

**Taraxacum dealbatum** was reported from Xinjiang (Higher Pl. China 11: 769, 2005), but this report is almost surely erroneous.


纯白蒲公英  chun bai pu gong ying

Herbs to 10 cm tall, delicate. Petiole purplish to greenish, narrow to narrowly winged, ± sparingly arachnoid; leaf blade ± mid-green, linear, 3–7 × (0.2–)0.3–0.5(–0.7) cm, sparsely arachnoid, margin often entire but sometimes dentate to shallowly lobed; lateral teeth or lobules mostly 4–7 pairs, narrowly triangular, mostly 1–1.5 mm, patent; interlobes broad, margin entire; terminal lobe not distinctly developed. Scapes brownish green, subequalling leaves, ± sparingly arachnoid. Capitulum 1.5–2 cm wide. Involucre 5–7 mm wide, base ± rounded. Outer phyllaries (10–)14–17, deep to light green, often with a narrow blackish middle strip, and darker apically, ± imbricate, outermost ones ovate and 4.5–5 × 2–2.7 mm, middle ones ovate-lanceolate, ca. 5 × 2 mm, and 1/3–1/2 as long as inner ones, appressed, with a membranous 0.1–0.2 mm wide border, margin almost glabrous, apex flat to callose; inner phyllaries 8–9 mm, apex flat. Ligules inside pure white; outer ligules almost flat, outside striped pinkish or faintly gray pinkish; inner ligules white, with or pinkish apical teeth. Stigmas grayish green to almost black. Anthers without pollen. Achene light grayish straw-colored, (3.7–)4.4–5 × ca. 0.9 mm; body almost smooth below, subsparsely spinulose above, gradually narrowing into a subcylindric 0.7–1(–1.1) mm cone, spinules thin and erect-patent; beak 3.2–5.5 mm, thin. Pappus yellowish white, 5–6.5 mm. Fl. spring to autumn. Agamosperm.

Temporarily wet subsaline to saline alpine grasslands, wet saline meadows in mountains; 2000–3000 m. S Xinjiang, W Xizang [Afghanistan, India, Tajikistan].

In areas adjacent to China *Taraxacum candidatum* reaches an elevation of ca. 5300 m.


华蒲公英  hua pu gong ying


Herbs 8–15(–25) cm tall. Petiole brownish purple, narrow; leaf blade ± mid-green, linear-oblancoceolate, 7–10(–15) × 0.6–1 cm, subglabrous to sparsely arachnoid, margin usually pinnatifid, pinnatisect, or very deeply dissected or rarely undivided; lateral lobes 5–7(–9) pairs, linear to linear-triangular, ± recurved; interlobes narrow, usually 5–7 mm, margin entire; terminal lobe narrow, elongated, base sagittate, apex ± acute. Scapes brownish green, ± overtopping leaves, arachnoid and
Taraxacum armeriifolium  
D. Z. Ma.

Herbs 4–10(–15) cm tall. Petiole purplish to greenish, narrow; leaf blade ± light green to slightly grayish green, linear to linear-oblong-ovate, 4–8(–11) × 0.5–0.9 cm, ± glabrous, margin usually deeply lobed to dissected but sometimes entire; lateral lobes 3–7 pairs, linear, linear-triangular, or narrowly triangular, ± recurved; interlobes short, margin entire; terminal lobe elongated, narrow, apex ± acute. Scapes brownish green, ± equaling leaves, ± sparsely arachnoid and densely so below capitulum. Capitulum 1.5–2.5 cm wide. Involucre 5.5–7.5 mm wide, base subconic. Outer phyllaries 12–15, light green with darker tips, ± imbricate, outermost ones ovate and 3.5–5.5 × 1.7–3 mm, middle ones ovate-lanceolate, ca. 6.5 × 2.5 mm, and ca. 1/2 as long as inner ones, appressed, with a ± conspicuous membranous to whitish 0.2–0.4 mm wide border, margin glabrous, apex ± flat to slightly ciliate; inner phyllaries 10–13 × ca. 1 mm, apex flat. Ligules deep yellow; outer ligules ± flat, outside striped dark gray; inner ligules with yellow to grayish apical teeth. Stigmas grayish green. Anthers polliniferous; pollen grains irregular in size. Achene light yellow to grayish apical teeth. Stigmas greenish gray. Anthers polliniferous; pollen grains irregular in size. Achene grayish straw-colored brown, 3.9–4.5 mm; body apically subsparsely spinulose, gradually narrowing into a ± cylindrical 0.9–1.2 mm cone, spines thin, erect-patent; beak 5–7(–8) mm, thin. Pappus slightly yellowish white, 5–6 mm. Fl. summer. AgamospERM. 2n = 24.

Subsaline pastures, temporarily wet grasslands, substeppe depressions; 600–2000 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi [Kyrgyzstan, Mongolia, Russia (Altai)].


8. Taraxacum armeriifolium

全叶蒲公英  
quan ye pu gong ying

Taraxacum oblanceifolium  
D. Z. Ma.

Herbs 5–10 cm tall. Petiole usually purplish or greenish, unwinged; leaf blade mid-green, ± linear to linear-oblong-ovate, 4–6(–9) × 0.6–1.5 cm, ± subglabrous, margin usually pinnatisect or rarely ± entire; lateral lobes 4–6 pairs, linear-triangular to narrowly triangular, 3–8 × 3–4 mm, recurved, margin entire; interlobes short, 3–4 mm wide, margin entire; terminal lobe elongated, linear-triangular, base sagittate, margin entire, apex acute. Scapes greenish, sparsely arachnoid mainly below capitulum. Capitulum 2–2.5 cm wide. Involucre 7–10 mm wide, base rounded. Outer phyllaries 13–17, deep green to dark green, conspicuously imbricate, ovate to broadly ovate, outermost ones 4–5(–7.5) × (2–)2.5–3.5 mm and 1/4–1/2 as long as inner ones, appressed, with a distinct whitish membranous 0.4–0.8 mm border, margin glabrous to sparsely ciliate at apex, apex ± coriaceous; inner phyllaries 1–1.3 cm, ± coriaceous below apex. Ligules inside yellow to pale yellow; outer ligules flat, outside striped gray. Stigmas pale green. Anthers polliniferous; pollen grains irregular in size. Achene grayish straw-colored brown, 3.9–4.5 mm; body apically subsparsely spinulose, gradually narrowing into a ± cylindrical 0.9–1.2 mm cone, spines thin, erect-patent; beak 5–7(–8) mm, thin. Pappus slightly yellowish white, 5–6 mm. Fl. summer. AgamospERM.

Wet saliniferous; pastures along rivers; 3600–4000 m. SW Xinjiang [Tajikistan].

10. Taraxacum luridum  

红角蒲公英  
hong jiao pu gong ying

Herbs 5–10 cm tall. Petiole usually greenish, seldom pinkish, ± narrowly winged; leaf blade mid-green to slightly bluish green, ± linear, 5–7(–8) × 0.6–0.9(–1.1) cm, ± subglabrous or glabrous, margin usually sinuate-dentate to pinnatilobed but often entire to subentire; lateral lobes 4–8 pairs, linear to linear-triangular, to 6 × 0.5–1.5 mm, usually patent, sometimes recurved or curved upward, margin ± entire; interlobes 5–10 mm, entire; terminal lobe often elongated, to 1.5 cm, sometimes not distinct, entire. Scapes greenish brown, subequaling leaves, sparsely arachnoid, later glabrescent. Capitulum 2–2.5 cm wide. Involucre 6–8 mm wide, base rounded. Outer phyllaries 8 or 9(–13), ± not imbricate, broadly ovate to ovate-lanceolate, outermost ones 4–5 × 2.7–3 mm and 2/5–1/2 as long as inner ones, appressed to loosely so, middle ones dark green and 0.8–1.5 mm wide, with a gradual transition into a pale whitish green or membranous 0.5–0.8(–1) mm border, margin glabrous to sparsely ciliate at apex, apex callose to coriaceous; inner phyllaries 1–1.1 cm, ± coriaceous below apex. Ligules flat; outer ligules outside striped grayish green to pinkish gray, inside white; inner ligules pale yellowish at base but otherwise white. Stigmas pale grayish yellowish green. Anthers polliniferous; pollen grains irregular in size. Achene grayish straw-colored brown, (3.5–)3.8–4.2(–4.5) mm; body apically sub-
subimbricatibus, stigmatibus sordide luteis vel luteo-viridibus, antheris polliniferis, acheniis pallide grayish brown; inner ligules canaliculate, with purplish apical teeth; ligule tube pubescent. Stigmas dirty yellow. Anthers polleniferous; pollen grains irregular in size. Achene light grayish brown; inner ligules canaliculate, with purplish apical teeth; ligule tube pubescent. Stigmas dirty yellow. Anthers polleniferous; pollen grains irregular in size. Achene light grayish straw-colored brown, 5.2–5.7 × ca. 1 mm; body with prominent lateral ridges, ± sparsely spinulose mainly on ridges in upper ca. 2/3 and elsewhere in upper ca. 1/3, very gradually narrowing into a thick ± subconic 1.3–1.5 mm cone, spinules long, thin, and erect and with some also on cone; beak 4.5–5 mm, ± thin. Pappus ± white, ca. 7 mm. Fl. spring and summer. Agamosperm.

- Alluvial pastures, shrubby meadows; ca. 600 m. W Xinjiang.

13. Taraxacum patiens Kirschner & Štěpánek, sp. nov.


**Plantae agamospermae foliis pinnatisectis lobis lateralis remotis, recurvatis, angustis, volgo integris, phyllaris involucralibus exterioribus adpressis, imbricatis, late ovatis usque anguste lanceolatis, viridibus, marginibus albo-membranaceis, ligulis saturate luteis, stigmatibus sordide luteis, antheris polleniferis, achenis eximie longis, subalatis, sparse spinulosis, sensim in pyramide longam abeuntibus.**

Herbs 10–17 cm tall. Petiole grayish purple, unwinged; leaf blade grayish mid-green with a grayish purple midvein, ± linear, 12–16 × (1.2–)1.5–1.8 cm, ± subglabrous, pinnatisect; lateral lobes 5 or 6 on each side, usually alternate, narrowly triangular or from a broader base abruptly narrowed into linear-oblong distal part, 5–8 × 3–4 mm, usually recurved, proximal margin entire, distal margin entire or with a single tooth, apex acute; interlobes 8–14 × 2–3(–4) mm, margin entire or with a single tooth; terminal lobe narrowly triangular, 1.5–2 × 0.8–1.4 cm, margin entire but distally concave, apex acuminate. Scapes greenish brown to purplish, ± equaling leaves, arachnoid. Capitulum 3–3.5 cm wide. Involucere 6–8 mm wide, base flat-rounded. Outer phyllaries with deep green middle part and a gradual transitioning into whitish membranous to 1 mm border but later in season with only a 0.2–0.4 mm wide border; outer phyllaries in early spring plants 11–14, suffused reddish in distal ca. 1/3, ± imbricate, broadly ovate to ovate-lanceolate, outermost ones 4–5 mm and to 1/2 as long as inner ones, appressed, apex callose to coriaceous; outer phyllaries in early summer flowering plants 18–21, conspicuously imbricate, ovate-lanceolate to narrowly lanceolate, outermost ones 5–6 × 2.5–3 mm and 2/5–1/2 as long as inner ones, apex usually reddish callose; inner phyllaries ca. 1.2 cm, flat to ± coriaceous below apex. Ligules deep yellow, ± flat; outer ligules outside striped purplish grayish brown; inner ligules canaliculate, with purplish apical teeth; ligule tube pubescent. Stigmas dirty yellow. Anthers polleniferous; pollen grains irregular in size. Achene light grayish straw-colored brown, 5.2–5.7 × ca. 1 mm; body with prominent lateral ridges, ± sparsely spinulose mainly on ridges in upper ca. 2/3 and elsewhere in upper ca. 1/3, very gradually narrowing into a thick ± subconic 1.3–1.5 mm cone, spinules long, thin, and erect and with some also on cone; beak 4.5–5 mm, ± thin. Pappus ± white, ca. 7 mm. Fl. spring and summer. Agamosperm.

12. Taraxacum iliense Kirschner & Štěpánek, sp. nov.

**Type:** China. Xinjiang: “Ad ripam fluminis Ili He [伊犁河], haud procul ab oppido Yining [伊宁],” 30 Sep 2004, P. Sekera, P. Hanzelka & I. Bulánková 30/32 (holotype, PRA; isotypes, A, MO, PE).

Paratypes: China. Xinjiang: “Ad ripam fluminis Ili He [伊犁河], 40 km E of the city of Lhasa [拉萨市],” ca. 3650–3850 m, 8 Jun 2002, M. Štefánek 41, cultivated as JŠ 7818, JŠ 7819, JŠ 7820 (PRA).
late-linear distal part, 5–10 × 2–3 mm, patent to slightly sub-recurved, proximal margin ± straight and entire or with one tooth, distal margin concave to sigmoid and entire or with one tooth; interlobes to 12 × 2 mm, margin ± entire; terminal lobe 3-partite, basal segments patent, terminal segment lingulate-elongated, 7–14 × 2.5–4 mm, and apex ± acute. Scapes brownish green, ± overtopping leaves, arachnoid. Capitulum ca. 7–14 × 2–3.5 mm, and apex ± acute. Scapes brownish green, ± overtopping leaves, arachnoid. Capitulum ca. 7–14 × 2.5–4 mm, and apex ± acute. Scapes brownish green, ± overtopping leaves, arachnoid. Capitulum ca. 7–14 × 2.5–4 mm, and apex ± acute. Scapes brownish green, ± overtopping leaves, arachnoid. Capitulum ca. 7–14 × 2.5–4 mm, and apex ± acute.

**Herbs 16–22 cm tall. Petiole purplish, narrow, brownish arachnoid at base; leaf blade ± light green, linear to narrowly oblanceolate, 8–14 × (0.2–)0.8–2.7 cm, arachnoid, in early flowering plants margin subentire or denticulate but in later plants pinnatisect; lobes in late flowering plants 5–8 pairs, ± linear to linear-triangular, 7–13 × 1–3 mm, ± patent, margin entire, apex acute; interlobes 5–12 × ca. 2 mm, margin entire; terminal lobe lingulate-elongated, narrow, 3-partite, basal segments patent, terminal segment 2.5–4 × 0.3–0.5 mm and apex ± acute. Scapes brownish purple, ± equaling leaves, ± densely arachnoid and densely so below capitulum. Capitulum not fully opening, ca. 2 cm wide. Involucre 7–9 mm wide, base subtruncate. Outer phyllaries 12–16 and ovate-lanceolate to broadly ovate in early plants, 15–25 and ± lanceolate in later flowering plants, deep green with darker apical part, ± imbricate, outermost ones 5–7 × 2.5–3.5 mm and ca. 1/2 as long as inner ones, opposed to loosely appressed, with membranous to whitish green border to 1.1 mm wide, margin glabrous and minutely sparsely denticulate, apex ± callose; inner phyllaries ca. 1 cm, apex callose or subcoriaceous. Ligules pale cream yellow or pale yellowish white, deeper so at base; outer ligules canaliculate, ± erect, outside striped gray pubescent; inner ligules subtubular, with reddish or cream apical teeth; ligule tube densely pubescent. Stigmas yellowish green, almost not exserted in outer florets, not exserted in inner florets, blackish pubescent outside. Anthers polliniferous; pollen grains irregular in size. Achene light grayish straw-colored brown, robust, 4.2–4.4 × ca. 1.2 mm; body subsparsely spinulose above, subabruptly narrowing into a subcylindric ca. 1 × 0.4 mm cone, spinules coarse, curved upward, larger on ridges, and usually 1 or 2 on cone; beak 6–7 mm. Pappus dirty white, ca. 7 mm. Fl. spring to summer. Agamosperm.

### 14. Taraxacum cereum Kirschner & Štěpáněk, sp. nov.

**蜡黄蒲公英 la huang pu gong ying**

**Type:** China. Xinjiang: “Montes Tian Shan [天山], pars montium Borohoro Shan [婆罗科努山]; lacus Sayram Hu,” 29 Sep 2004, P. Sekerka, P. Hanzelka & I. Bulánková 04/26, cultivated as JS 7964 (holotype, PRA; isotypes, A, MO, PE).

Plantae agamospermae foliis subintegris usque profunde pinnatisectis araneosis, lobis lateralis ± linearibus, capitulis subopertis pallide luteolis usque cereis, phyllariis involucralibus ± ovatis, deinde ± lanceolatis late pallide marginatis, flosculis exterioribus canaliculatis, interioribus subtubalosis tubo subvescente, stigmatibus obscure lateo-viridibus, achenis robustis, grosse subsparse spinulosis, spinulis saepe sursum curvatis, corpore in pyramidem subcylindricam crassam ca. 1 mm longam subabrupte transiente.

**Members of this section usually occur in dry substeppe to steppe habitats with a center of distribution in Mongolia and Russia (S Siberia).**


**Shen lie pu gong ying zu**

Leaves usually pinnatisect to deeply dissected. Outer phyllaries usually numerous, ovate-lanceolate to linear-lanceolate, most often loosely appressed to recurved at apex or ± patent, narrowly pale bordered, outer and/or inner ones usually coriaceous to horned. Florets yellow. Achene narrow, almost smooth below, ± densely spinulose in upper ca. 1/4; body usually gradually to subgradually narrowing into a ± thin cylindric or rarely subcylindric usually 0.9–1.2 × 0.2–0.3 mm cone, spinules minute; beak 7–9 mm, thin.

About seven species: China, Kazakhstan, Mongolia, Russia; four species (two endemic) in China.

Members of this section usually occur in dry substeppe to steppe habitats with a center of distribution in Mongolia and Russia (S Siberia).


The name **Taraxacum heterolepis** Nakai & Koidzumi ex Kitagawa (Bot. Mag. (Tokyo) 47: 829. 1933) is based on a holotype specimen that lacks important characters and cannot be safely classified, not even to the section. It is accepted in FRPS (80(2): 80. 1999) as the correct name for **T. multisectum** (see below) but differs from the latter in the shape and posture of outer phyllaries and in important achene features.

Type material of the name **Taraxacum falcilobum** Kitagawa (Rep. Inst. Sci. Res. Manchoukuo 2: 312. 1938), also referred to this group in FRPS
Representatives of this section often appear under the name Taraxacum asiaticum, the lectotype of which (Kirschner & Štěpánek, Preslia 83: 498. 2011) proved to belong to T. scariosum (see below), a taxon often called T. stenolobum. Taraxacum asiaticum was reported to occur in a number of Chinese provinces (FRPS 80(2): 19. 1999), but a revision of the material is required.

1. Stigmas yellow .......................................................... 15. Taraxacum sinomongolicum

1a. Stigmas discolored (grayish green, greenish).

2a. Outer phyllaries 20–24, 1–1.5 mm wide .................................. 15. T. sinomongolicum

2b. Outer phyllaries 13–17, 2–4 mm wide.

3a. Achene body with short dense spinules, beak 7–9 mm ........................................... 17. T. abax

3b. Achene body with long subdense spinules, beak 10–11 mm ...................................... 18. T. multisetum


凸尖蒲公英 tu jian pu gong ying

Taraxacum cuspidatum Dahlstedt, Acta Horti Gothob. 2: 171. 1926, not Marklund (1911).

Herbs 12–15(–30) cm tall. Petiole usually purplish at base or greenish, unwinged; leaf blade mid-green, ± linear to linear oblanceolate, (8–)10–12(–16) × 0.8–1.5–2 cm, ± subglabrous, ± pinnatisect; lateral lobes (3 or)4–6 pairs, linear-triangular to narrowly triangular, 3–8 × 3–4 mm, recurved to ± patent, margin usually entire; interlobes 2–3(–4) mm wide, margin entire; terminal lobe narrowly triangular, sometimes elongated, base sagittate, margin entire, apex acute. Scapes greenish, sparsely arachnoid but more densely arachnoid below capitulum. Capitulum ca. 2 cm wide. Involucre 7–8 mm wide, base ± rounded. Outer phyllaries 20–24, deep green to pale green, ± imbricate, lanceolate to narrowly lanceolate but outermost ones sometimes linear, outermost ones 4–5.5(–7.5) × 1–1.5 mm and 2/5–1/2 as long as inner ones, appressed to loosely so, with a evident whitish membranous 0.2–0.3 mm border, margin glabrous to sparsely ciliate, apex flat; inner phyllaries 1.2–1.4 cm, apex ± coriaceous. Ligules ± yellow; outer ligules flat, outside striped gray to grayish pink; inner ligules with reddish apical teeth. Stigmas light greenish. Anthers polliniferous; pollen grains irregular in size. Achene pale grayish straw-colored, 4.2–4.7 × ca. 0.8 mm; body apically subsparsely to ± densely spinulose, ± gradually narrowing into a ± cylindric 0.8–1 mm cone; beak 8–9 mm, thin. Pappus white, 6–7 mm. Fl. spring and summer. Agamosperm. 2n = 24.

Dry steppe and substeppe habitats, roadsides, dry pastures; 900–3000 m. Hebei, Heilongjiang, Nei Mongol, Shanxi, Xinjiang, Xizang [Kazakhstan, Mongolia, Russia (Altai)].

The report of Taraxacum scariosum (as T. asiaticum) from Xinjiang (FRPS 80(2): 19. 1999) is probable but needs to be confirmed, as do those from Gansu, Hubei, Jilin, Liaoning, Qinghai, Shaanxi, and Sichuan.

The name, most often covering this species in the Russian and Chinese literature, Taraxacum stenolobum, was usually used in a very broad concept. The same applies to another frequently used name, T. asiaticum, for which the original material is very heterogeneous and the lectotype represents T. scariosum. We use the oldest epixet in a narrow sense of a single very widespread agamospermous species, within this section distinct in having yellow stigmas, very narrow achenes, narrow appressed outer phyllaries, and short corinculatio.


平版蒲公英 ping ban pu gong ying

Herbs 10–20 cm tall. Petiole usually purple at base, unwinged; leaf blade dull green to mid-green, narrowly oblanceolate, 7–10 × 1.5–2.8 cm, arachnoid, margin deeply dissected; lateral lobes 6–9 pairs, linear to linear-lingulate, 8–14 × 1–2(–2.5) mm, ± patent, sometimes slightly bent upward or downward, margin ± entire; interlobes 6–10 × 1–2 mm, margin

(80(2): 19. 1999), was not traced, and the protologue does not give relevant information as to its taxonomic position. The name is therefore listed among names awaiting further study.
with a few linear patent acute lobules or teeth; terminal lobe 3–partite, apical segment linear to linear-ligulate, 10–15 × 1.5(–3) mm, and apex acute; late summer leaves with broader lobes. Scapes greenish brown, ± equaling leaves, arachnoid but later sparsely so. Capitulum 2–3 cm wide. Involucre 1–1.2 cm wide, base ± rounded. Outer phyllaries 13–17, deep green to ± dark green, usually slightly glaucous and often suffused reddish in upper part, subimbricate, ± lancelate, outermost ones 7–9(–10) × (2.2)–2.6–3.1 mm and ca. 3/5 as long as inner ones, loosely appressed to ± erect, some slightly recurved at apex, with whitish membranous ca. 0.3 mm border, margin ± glabrous, apex with distinct horn or corniculate; inner phyllaries 1.2–1.5 cm, narrow, apex distinctly corniculate. Ligules deep yellow; outer ligules flat, outside striped grayish greenish pink; inner ligules with reddish apical teeth. Stigmas grayish green, densely dark pubescent. Anthers polliniferous; pollen grains irregular in size. Achenes grayish straw-colored brown, 3.9–4.3 × 0.8–0.9 mm; body apically ± densely shortly spinulose, subgradually to subapically narrowing into a subcylindrical 0.9–1.2 mm cone, spinules thin; beak 7–9 mm, thin. Pappus yellowish white, 6.5–7 mm. Fl. spring and summer. Agamosperm. 2n = 24.

Dry substeppe grasslands, pastures, roadsides; 700–2000 m. Hebei, Xinjiang [Russia (Siberia)].


异苞蒲公英 yi bao pu gong ying

Herbs 11–20 cm tall. Petiole pale green or purplish, sparsely arachnoid at very base but otherwise glabrous, unwinged; leaf blade mid-green, narrowly oblong, 7–16 × 1.2–2.4 cm, sparsely arachnoid, pinnatipartite; lateral lobes 3–5 pairs, ± linear, 8–16 × 1.2–2.3 mm, ± patent, margin ± entire, apex acute; interlobes 3–12 × 1–2 mm, margin filiform-dentate or lobulate; terminal lobe 3–partite, margin of segments entire, apex acute. Scapes brownish green, ± overtopping leaves, arachnoid. Capitulum 3–3.5 cm wide. Involucre 0.9–1.1 cm wide, base rounded. Outer phyllaries 10–14, dark green, margin and apical part often purple, with a gradual transition into paler border and a sharply delimited whitish ca. 0.3 mm wide border, not imbricate, usually broadly lanceolate to narrowly ovate, outermost ones (6–)7–9 × (2–)2.5–4 mm and ca. 1/2 as long as inner ones, appressed, later to erect-patent, margin ± glabrous or sparsely ciliate, apex ± callose, rarely flat; inner phyllaries 1.4–1.6 cm, apex ± flat to coriaceous. Ligules yellow; outer ligules ± flat, outside striped gray. Stigmas grayish green. Anthers polliniferous; pollen grains irregular in size. Achenes light grayish straw-colored brown, 4.6–5 × 0.8–0.9 mm; body sub-sparsely spinulose above, gradually narrowing into a ± cylindrical 0.9–1 mm cone, spinules long with longest ones to 0.5 mm, thin, erect-patent, acute, and some also on cone base; beak 1–1.1 cm, thin. Pappus ± white, ca. 7 mm. Fl. spring. Agamosperm.

- Steppe grasslands, pastures; below 100–300 m. Jilin, Liaoning, ?Nei Mongol.

The occurrence of Taraxacum multisectum in Nei Mongol is probably correct, but this record needs to be confirmed.

Taraxacum multisectum is similar to T. abax but substantially differs in having conspicuously long spinules on the achenes, longer beak, not horned, and seldom coriaceous outer phyllaries.


短喙蒲公英组 duan hui pu gong ying zu

Plants small, base usually densely hairy. Leaves usually arachnoid; petiole ± unwinged; leaf blade deeply lobed; lobes usually patent. Involucre narrow, usually to 6 mm wide. Phyllaries abaxially sparsely to densely arachnoid or less often surface glabrous, margin often long ciliate; outer phyllaries 6–10(–12), imbricate or subimbricate, broadly lanceolate to ovate, usually less than 5–6(–7) mm, appressed, margin with paler central part, apically coriaceous or with a horn at apex, horn usually blackish and erect. Receptacle glabrous or with a few arachnoid hairs. Florets few (usually less than 30 but sometimes less than 15), yellow. Achenes grayish straw-colored brown to grayish brown, 5–6.5 mm; body almost smooth or very sparsely spinulose above, very gradually and indistinctly narrowing into beak, cone not visible or thick and broadly conic, spinules few and remote; beak 0.2–4 mm, thick. Pappus yellowish white to pale brownish, 4.5–6 mm, often fragile.

About 15–18 species: centered in C Asia; two species in China.

In addition to the species listed below, Taraxacum pseudominutilobum Kovalevskaja was reported to occur in China (FRPS 80(2); 12. 1999). However, this name is based on the material from the Chatkal Range, W Tian Shan, and Angren Plateau, both in Uzbekistan, and the material studied shows that it is probably confined to these regions. No similar plants from China were seen.

1a. Leaf blade undivided; ligules pale yellow; achene beak 1–2 mm ................................................................. 19. T. syrtorum
1b. Leaf blade pinnatilobed; ligules mid-yellow; achene beak 0.2–1 mm .................................................... 20. T. minutilobum


高山耐旱蒲公英 gaoshan nai han pu gong ying

Herbs to 10 cm tall; plant base with remnants of old petioles. Petiole ± glabrous, unwinged; leaf blade ± light green, ± linear, 3–8 × 0.1–0.3(–0.5) cm, glabrous, not divided, margin entire or rarely minutely remotely dentate, apex subacute. Scapes greenish, ± equaling leaves, arachnoid and densely so below capitulum. Capitulum to 2 cm wide. Involucre 8–9 mm wide, base ± subbocconic. Outer phyllaries 8–10(–12), light green often suffused pinkish in upper part, subimbricate, ± lanceolate to narrowly triangular, outermost ones 5–7(–8) × 2–3 mm and ca. 1/2 as long as inner ones, appressed, abaxial surface slightly arachnoid, with a narrow whitish membranous border, margin densely arachnoid, near apex pale to blackish
corniculate; inner phyllaries (8–)10–12 × 1.1–1.5 mm, apex corniculate. Ligules pale yellow (becoming pinkish); outer ligules flat, outside striped faintly grayish. Achene gray straw-colored brown, ca. 6 × 1 mm; body apically totally smooth, with cone not discernible; beak 1–2 mm, very thick. Pappus brownish white, 5–6 mm. Fl. summer.

High alpine and subsaline slopes; ca. 4000 m. W Xinjiang (Wuqia) [Kyrgyzstan].


毛叶蒲公英 mao ye pu gong ying

Herbs to 8 cm tall, slender, delicate, tunic usually developed. Petiole pale green, densely arachnoid, unwinged but dilated at very base; leaf blade grayish green, linear to oblongate, 3–6 × 0.4–1.2 cm, densely arachnoid to lanate, sometimes glabrescent, pinnatipartite to pinnatisect; lateral lobes 3–5 pairs, narrowly oblong, 1.5–6 × 1–1.5 mm, patent, some subcurved or pointing upward, margin entire; interlobes usually 2–4 × ca. 1 mm, margin entire but sometimes with a few minute teeth; terminal lobe 3-partite, margin entire, basal segments ± recurved, terminal segment to 16 × 1.5 mm and apex subacute to acute. Scapes ± green, shorter than leaves, arachnoid. Capitulum to 1.5 cm wide. Involucre narrow, 3–4 mm wide, base obconic. Outer phyllaries 8–13, grayish olivaceous green, subimbricate, lanceolate to narrowly lanceolate but outermost ones to ovate-lanceolate or triangular, outermost ones 4–6 × 2–3 mm and 1/3–1/2 as long as inner ones, ± appressed to loosely appressed, abaxially densely arachnoid, with a whitish membranous 0.2–0.5 mm wide border, apex with a distinct blackish horn to 1 mm; inner phyllaries usually 8 or 9, 8–10 × 1.5–2(–2.5) mm, abaxially arachnoid but later glabrescent, border pink, apex corniculate. Ligules yellow; outer ligules flat to canaliculate, outside striped dark; inner ligules with reddish or yellow apical teeth. Stigmas deep yellow. Anthers polliniferous; pollen grains irregular in size. Achene light grayish straw-colored brown, ± cylindric, 5.5–6.1 × ca. 1 mm, totally smooth or with almost indistinct sparse minute tubercles, cone not discernible; beak whitish, 0.5–1 mm. Pappus dirty yellowish white to white, 5–6 mm, easily breaking off. Fl. summer. Agamosperm.

Stony slopes in high mountains; 3500–4500 m. S Xizang [Afghanistan, India (Ladakh), Pakistan, Tajikistan, Uzbekistan].

The problem surrounding the name Taraxacum brevirostre Handel-Mazzetti (Monogr. Taraxacum, 46, 1907) requires further study. In the literature, this name usually covers what is here called T. minutilobum, in accordance with the majority of original syntypes. The lectotype of this name comes from the Pamirs (Pamir region, 3900–4600 m, Alcock 17727, lectotype BM, no. det. 8426, fide Soest in K. H. Rechiner, Fl. Iranica 122: 234. 1977), and the type is intermediate between T. sect. Oligantha and T. sect. Atrata. The taxon represented by the lectotype is known only from the type collection and has not been found in China, although reported from Gansu, Qinghai, and Xizang (FRPS 80(2): 14. 1999).


大头蒲公英组 da tou pu gong ying zu


Plants robust. Petiole often winged; leaf blade shallowly to deeply lobed. Capitulum 3–6 cm wide. Involucre usually more than 1.5 cm wide. Outer phyllaries usually more than 10 × 4 mm, imbricate or not so, broadly ovate to lanceolate, appressed or rarely to patent, border usually distinct and pale, apex usually corniculate. Ligules yellow. Stigmas dark. Achene dark brown to straw-colored brown, usually more than 1.1–2 mm, ± densely spinulose above, subabruptly to abruptly narrowing into usually thick subconic to subcylindric 0.8–1.4 mm cone; beak usually 8–10 mm. Pappus white.

- Eight species: China.

The highest diversity of this section is in Sichuan. Sexuality is relatively common in this section.

1a. Outer phyllaries erect-patent to patent .......................................................... 25. T. grypodon

1b. Outer phyllaries appressed to erect.

2a. Achene 0.9–1 mm thick.

3a. Stigmas yellow to greenish yellow, rarely in populations plants with blackish green stigmas; outer phyllaries 9–14, usually narrowly lanceolate to ovate-lanceolate ................................................................. 23. T. peccator

3b. Stigmas black; outer phyllaries 13–17, usually ovate to ovate-lanceolate ................................................................. 24. T. forrestii

2b. Achene 1.1–2 mm thick.

4a. Achene cone 1.2–1.4 mm.

5a. Leaves undivided to shallowly lobed, lateral lobes 3–5, interlobes well developed and entire .... 22. T. platypedicum

5b. Leaves deeply pinnatipartite, lateral lobes 5 or 6, interlobes with a large acute tooth or lobule ............... 24. T. forrestii

4b. Achene cone 0.4–1.1 mm.

6a. Outer phyllaries without a paler border or border green, very narrow, and indistinct.

7a. Outer phyllaries 17–25, lanceolate to narrowly lanceolate; achene 1.2–1.4 mm thick .................. 26. T. lanigerum

7b. Outer phyllaries 11–19, broadly ovate to ovate-lanceolate; achene 1.5–2 mm thick .................. 27. T. lugubre

6b. Outer phyllaries with a distinct paler (whitish to greenish white) border.

8a. Outer phyllaries narrowly lanceolate to linear-lanceolate, 1.2–1.5 cm; stigmas blackish purple but probably brownish gray when fresh ................................................................. 28. T. pseudonutans
The report of *Taraxacum platypecidum* for a number of additional provinces and for Korea and Japan (FRPS 80(2): 43 1999; Higher Pl. China 11: 778. 2005) is probably incorrect. However, although not yet seen by the authors among the specimens studied, the species should be looked for in the mountainous provinces adjacent to Hebei and Shanxi.

23. *Taraxacum peccator* Kirschner & Štěpánek, sp. nov.


Plantaes sexuales, habitu tuto floribusque ad Taraxacum platypecidum Diels valde accedentes, sed ab eo different folis argutis divis lobis lateralisibus approximatis, phyllaris involucralibus exterioribus tantum (9 vel)10 ad 13(vel 14), ovato-lanceolatis vel linearis-lanceolatis, minoribus (plerumque 6.5–8.5 mm longis et 2–3 mm latis), granis pollinis aequimagnis,
achensis griseo-stramineis 4.5–4.9 mm longis pyramide sub-
conica solum 0.6–0.8 mm longa.

Herbs (4–)12–20(–30) cm tall. Petiole green to purplish,
often 3–6 cm, narrow, sparsely arachnoid; leaf blade mid-green,
of variable shape, ob lanceolate to narrowly ob lanceolate,
(2–)5–10(–15) × 1.5–3.5 cm, arachnoid and usually densely
so, margin almost undivided and sinuate-dentate or more often
deply pinnatisect; lateral lobes (3–)5–9(–11) pairs, narrowly
triangular to narrowly deltoid, ± approximate, ± patent, some-
times subrecurved, margin entire or rarely ± dentate and on dis-
tal side usually sigmoid; interlobes short, narrow; terminal lobe
triangular to 3-partite, terminal segment narrowly triangular and
apex acute to subobtuse. Scapes brownish green or purplish,
± distinctly veined, border ± flat or blackish callose. Ligules
yellow, not striped or outside very faintly striped grayish; inner ligules
with yellow or pinkish apical teeth; floret tube ± glabrous. Stig-
mas variable in color, usually yellow, dirty yellow, or greenish
yellow but sometimes blackish green (within population). An-
thers polliniferous; pollen grains irregular in size. Achene (not
fully ripe) grayish straw-colored brown, (4–)4.5–4.9 × 0.9–1
mm; body spinulose in upper ca. 1/3, subgradually narrowing
into a subconic 0.6–0.8 mm cone, spinules minute and thin.
Pappus white, 5–6 mm. Fl. summer. Sexual.

● Subalpine meadows; 1400–3000 m. Hebei (Xiaowutai Shan).

Taraxacum peccator is a sexual relative of agamospermous plants
of the T. platycedum group, probably confined to Hebei (Xiaowutai Shan).
It deviates from T. platycedum in the type of reproduction,
deeply dissected leaves with dense approximate segments, lower
number of outer phyllaries, smaller outer phyllaries, and very different
achenes.


反苞蒲公英 fan bao pu gong ying

Herbs to 10 cm tall. Petiole short, narrow; leaf blade mid-green,
broadly ob lanceolate, 5–6 × 1.2–2.5 cm, arachnoid,
pinnatisect; lateral lobes 5 or 6 approximate pairs, narrowly tri-
angular, ± patent, distal margin and/or interlobes with a large
acute tooth or lobule, apex acute to acuminate; terminal lobe
often 3-partite with segment apices acute. Scapes ± equaling
leaves, arachnoid and densely so below capitulum. Capitulum
3.5–4 cm wide. Involucre 1.4–1.8 cm wide, base broadly
rounded. Outer phyllaries 13–17, ± imbricate, ovate to ovate-
lanceolate but outermost ones narrowly lanceolate, outermost
ones 6–8(–11) × (2–)3.5–4.5 cm and ca. 1/2 as long as inner
ones, appressed, median part blackish green to black, usually
± distinctly veined, border distinct, white or apically suffused
pinkish, and ca. 1 mm wide, margin subglabrous to ciliate and
blackish purple com nulate below apex; inner phyllaries 1.6–1.8
cm. Ligules yellow; outer ligules outside dark striped. Stigmas
black. Anthers polliniferous; pollen grains irregular in size.
Achene unknown. Pappus white. Fl. summer. Agamosperm.

● Alpine stony grasslands; 4200–4800 m. SE Xizang, NW Yun-
nan.

25. Taraxacum grypodon Dahlstedt, Acta Horti Gothob. 2:
157. 1926.

血苞蒲公英 duo mao pu gong ying

Herbs 20–30 cm tall, robust. Petiole ± pale green to pur-
plish, narrow; leaf blade pale green, ob lanceolate to narrowly
ob lanceolate, 12–15 × 2–2.5 cm, sparsely arachnoid, undivi-
ded or lobed; lateral lobes broadly triangular, remote, recurved-
hamate; interlobes long, margin subentire with 1–3 triangular
teeth; terminal lobe elongated, apex subobtuse. Scapes
brownish green, overtopping leaves, apically yellowish arach-
noid. Capitulum 5.5–5.5 cm wide. Involucre 1.6–1.8 cm wide,
broadly rounded Outer phyllaries 20–24, ovate-lanceolate,
innermost ones 13–16 × 4.5–5.5 mm and 3/5–4/5 as long as
inner ones, unequal, ± patent to erect-patent, middle part
greenish at base and apically blackish green, distinctly veined,
border white, membranous, and ca. 0.2 mm wide but apically
pink and ca. 0.5 mm wide, margin sparsely ciliate, apex blackish
green, blunt, and com nulate below tip; inner phyllaries to 2 cm.
Ligules yellow; outer ligules outside striped grayish; inner lig-
ules with blackish apical teeth; floret tube sparsely puberulent.
Stigmas blackish green. Anthers polliniferous; pollen grains
slightly irregular in size. Achene brown, 4.5–4.8 × ca. 1.2 mm;
body densely spinulose and squamulose above, ± smooth to
tuberculare below, ± abruptly narrowing into a subcylindric ca.
1 mm cone; beak 8–9 mm. Pappus yellowish white, ca. 9 mm.
Fl. summer. Probably sexual.

● Subalpine meadows; 3100–3300 m. Qinghai, N Sichuan.

Taraxacum grypodon was also reported from E Xizang (FRPS
80(2): 42. 1999; Higher Pl. China 11: 777, 2005), but a revision of
the material is required.

As there are no ripe achenes in the authentic material of Tarax-
acum grypodon, their description is compiled on the basis of Anony-
 nous 8486 (PE, no. det. 22956), from Qinghai.


多毛蒲公英 duo mao pu gong ying

Herbs (10–)15–20 cm tall, robust. Petiole pale green to
grayish purple, unwinged; leaf blade mid-green to slightly
brownish green and sometimes with small dark spots, oblan-
ceolate to ± elliptic, (5–)8–15 × 1.5–4 cm, sparsely to densely
arachnoid, pinnatipartite to pinnatisect but sometimes undivi-
ded, midvein proximally black, ± distinctly veined, border
blunt, teeth recurved; lateral lobes 4 or 5(–8) pairs, triangular to narrowly
falcate, recurved, margin entire or on distal side with a single
tooth, apex subacute with tip often elongated into a very narrow
variously pointing terminal part; interlobes short and broad, margin ± entire, dentate, or lobulate; terminal lobe triangular to narrowly triangular, margin entire or sparsely denticulate and sometimes distally with a distinct incision, apex acute to subacute, basal segments recurved to subpatent. Scapes brownish green, subequalling leaves, apically densely whitish brown arachnoid but sometimes glabrescent. Capitulum 3.5–5 cm wide. Involucre 0.7–1.2 cm wide, base broadly rounded. Outer phyllaries 17–25, blackish green to olivaceous green, ± not imbricate, lanceolate to narrowly lanceolate, outermost ones 7–13 × 3–5 mm and 2/3–4/5 as long as inner ones, loosely appressed to erect, unbordered to very narrowly paler bordered, margin sparsely to densely ciliate or subglabrous, distally often suffused brownish purple; inner phyllaries 1.3–1.7 cm. Ligules yellow; outer ligules flat, outside striped gray or yellowish gray, floret tube puberulent. Stigmas blackish green. Anthers polliniferous; pollen grains regular in size. Achene variable, straw-colored brown, dark brown, grayish brown, or almost black, 3.6–5.6 × 1.5–2 mm; body spinulose and squamulose above, uppermost part squamulose, abruptly narrowing into a conic 0.4–0.7–0.9 mm cone; beak 6.5–9 mm. Pappus brownish to yellowish white, 6–7.5 mm. Fl. summer. Sexual.

- Alpine meadows and grasslands, open-ground slopes; 4000–4600 m. Sichuan.

Taraxacum lugubre was also reported from Gansu, Qinghai, and Xizang (FRPS 80(2): 40; 1999; Higher Pl. China 11: 777. 2005), but a revision of the material is required.

28. Taraxacum pseudonutans Kirschner & Štěpánek, sp. nov.

Type: China. Ningxia: “Haiyuan County [海原县], Jiangyang Qu,” 7 Sep 1956, Yellow River Expedition 5240 (holotype, PE, no. det. 24853).


Planta agamospermae, in comparatione Taraxaci nutan-tis Dahlstedt (e Taraxaco sect. Biennis R. Doll) folis argutius divis, calanthido minore ca. 4.5 cm diametro, phyllariis involucralibus exterioribus numero restricto fere 15 ad 21, brevierioriis latoriobusque, 1.2–1.5 cm longis et 3–4.5 mm laitis, graniis pollinis diametro imparibus.

Herbs 20–40 cm tall, usually robust. Petiole pale green to purple, unwinged; leaf blade vivid green with midvein pale green or proximally pinkish, narrowly oblanceolate to ± narrowly elliptic, 10–14 × 1.5–3 cm, sparsely arachnoid to ± glabrous, pinnatipartite to pinnatisect but sometimes undivided, margin remotely dentate; lateral lobes 3–5(or 6) pairs, triangular to narrowly triangular, patent to subrecurved, margin ± entire, apex subobtus to obtuse; interlobes to 1 cm wide, margin ± entire or with a single tooth; terminal lobe triangular to helmet-shaped, margin entire, apex subacute. Scapes pale brownish green, subequalling leaves, sparsely arachnoid but sometimes apically densely arachnoid. Capitulum 3.5–4 cm wide. Involucre 1.2–1.5 cm wide, base broadly rounded to truncate. Outer phyllaries (11–)13–19, ± imbricate, ovate-lanceolate to broadly ovate, outermost ones 6–11 × 4–7 mm and 1/2–3/4 as long as inner ones, loosely appressed, venation not distinct, abaxially glabrous or sparsely arachnoid, middle part blackish green to dark green but blackish or black when dry, with a greenish white 0.1–0.3(−2.4) mm wide border or rarely unbordered, margin sparsely to densely ciliate, apex ± callose; inner phyllaries blackish green, 1.4–1.6 cm, abaxially sometimes arachnoid. Ligules yellow; outer ligules flat, 1.8–3.6 mm wide, outside striped grayish or dark gray; floret tube puberulent. Stigmas blackish purple. Anthers polliniferous; pollen grains regular in size. Achene variable, straw-colored brown, dark brown, grayish brown, or almost black, 3.6–5.6 × 1.5–2 mm; body spinulose above, uppermost part squamulose, abruptly narrowing into a conic 0.4–0.7(−0.9) mm cone; beak 6.5–9 mm. Pappus brownish to yellowish white, 6–7.5 mm. Fl. summer. Sexual.

- Subalpine to alpine meadows and grasslands; 3500–4200 m. Sichuan.

Taraxacum lanigerum was also reported from Xizang (FRPS 80(2): 40. 1999; Higher Pl. China 11: 777. 2005), but the material under this name in herbarium collections belongs to other taxa.


川甘蒲公英 chuan gan pu gong ying

Herbs 10–18 cm tall, medium-sized. Petiole pale green to purple, unwinged; leaf blade vivid green with midvein pale green or proximally pinkish, narrowly oblanceolate to ± narrowly elliptic, 10–14 × 1.5–3 cm, sparsely arachnoid to ± glabrous, pinnatipartite to pinnatisect but sometimes undivided, margin remotely dentate; lateral lobes 3–5(or 6) pairs, triangular to narrowly triangular, patent to subrecurved, margin ± entire, apex subobtus to obtuse; interlobes to 1 cm wide, margin ± entire or with a single tooth; terminal lobe triangular to helmet-shaped, margin entire, apex subacute. Scapes pale brownish green, subequalling leaves, sparsely arachnoid but sometimes apically densely arachnoid. Capitulum 3.5–4 cm wide. Involucre 1.2–1.5 cm wide, base broadly rounded to truncate. Outer phyllaries (11–)13–19, ± imbricate, ovate-lanceolate to broadly ovate, outermost ones 6–11 × 4–7 mm and 1/2–3/4 as long as inner ones, loosely appressed, venation not distinct, abaxially glabrous or sparsely arachnoid, middle part blackish green to dark green but blackish or black when dry, with a greenish white 0.1–0.3(−2.4) mm wide border or rarely unbordered, margin sparsely to densely ciliate, apex ± callose; inner phyllaries blackish green, 1.4–1.6 cm, abaxially sometimes arachnoid. Ligules yellow; outer ligules flat, 1.8–3.6 mm wide, outside striped grayish or dark gray; floret tube puberulent. Stigmas blackish purple. Anthers polliniferous; pollen grains regular in size. Achene variable, straw-colored brown, dark brown, grayish brown, or almost black, 3.6–5.6 × 1.5–2 mm; body spinulose above, uppermost part squamulose, abruptly narrowing into a conic 0.4–0.7(−0.9) mm cone; beak 6.5–9 mm. Pappus brownish to yellowish white, 6–7.5 mm. Fl. summer. Sexual.

- Alpine meadows and grasslands, open-ground slopes; 4000–4600 m. Sichuan.
pollen grains irregular in size. Achene (only not fully ripe ones available) light brown, 4.7–5 × 1.2–1.6 mm; body ± densely spinulose and squamulose above, spinules short, obtuse, and ± tuberculate to smooth below, ± subgradually narrowing into a conic 0.7–1 mm cone; beak probably long. Pappus dirty white. Fl. summer. Agamosperm.

- Mountain grasslands, pastures, along paths; 2300–2800 m. S Gansu, Ningxia.


西藏蒲公英组 xi zang pu gong ying zu

Plants usually small, delicate. Petiole ± unwinged; leaf blade usually with recurved lateral segments, their distal margin often sigmoid. Outer phyllaries (5–)9–13(–22), black or black green, not imbricate or ± imbricate, ovate-lanceolate, lanceolate, or sometimes linear-lanceolate, appressed, unbordered or less often with a pale border, apex flat or callose. Stigmas usually black or blackish green, rarely yellow. Achene usually 4–5.5 × (1–)1.2–1.4 mm; body most often densely shortly spinulose or squamulose above, sometimes with longer erect spinules, gradually to subabruptly narrowing into a conic to thickly subcylindric 0.6–1.7 mm cone; beak 5–10 mm. Pappus white or yellowish, 5–8 mm. Sexual or agamospermous.

About 25 species: highest diversity in S Xizang, N Yunnan, and W Sichuan; 17 species (15 endemic) in China.

In China this section contains sexual species with wider variation ranges (i.e., Taraxacum apargiiforme and T. eriopodum) and an array of agamospermous species, which are usually known from only rather scanty material.

1a. Pollen absent.
   2a. Stigmas yellow ................................................................. 32. T. atrocarpum
   2b. Stigmas blackish to dark grayish green.

1b. Pollen present.
   5a. Pollen grains regular in size.
      6a. Outer phyllaries 15–18; involucre base broadly rounded; achene cone 1–1.5 mm ......................... 29. T. eriopodum
      6b. Outer phyllaries 11–13; involucre base obconic; achene cone 0.6–0.7 mm ................................. 37. T. apargiiforme
   5b. Pollen grains irregular in size.
      7a. Stigmas yellow ................................................................. 33. T. mutatum
      7b. Stigmas blackish to dark grayish green.

   8a. Outer phyllaries with a distinct whitish border.
      9a. Leaf lateral lobes in 5–9 pairs; outer phyllaries not imbricate ........................................ 35. T. subcoronatium
      9b. Leaf lateral lobes in 2–4 pairs; outer phyllaries ± imbricate.
   10a. Outer phyllary border 0.3–0.4 mm wide; leaf lateral lobes not remote ........................ 40. T. chionophilum
   10b. Outer phyllary border ca. 0.2 mm wide; leaf lateral lobes remote .......................... 43. T. centrasiaticum
   8b. Outer phyllaries unbordered or with an indistinct paler border to 0.1 mm wide.
      11a. Outer phyllaries usually 7–9 mm ........................................... 30. T. tibetanum
      11b. Outer phyllaries usually 4–7 mm.

   12a. Outer phyllaries densely ciliate.
      13a. Achene dark grayish olivaceous, light straw-colored brown when unripe; cone conic ................................................................. 39. T. apargia
      13b. Achene reddish brown to dark reddish brown, ochraceous reddish when unripe; cone cylindric to subcylindric.
      14a. Achene 3.9–4.2 mm ............................................. 44. T. austrotibetanum
      14b. Achene 4.3–5.1 mm ............................................. 45. T. suavissimum
   12b. Outer phyllaries ± glabrous or very sparsely ciliate.
      15a. Leaves undivided but margin sometimes remotely minutely denticate ............... 41. T. staticifolium
      15b. Leaves pinnatifolobed, pinnatisect, or at least lobulate.
      16a. Outer phyllaries 5–9; involucre 5–7 mm wide; leaf terminal lobe elongated ........................................ 38. T. mastigophyllum
      16b. Outer phyllaries 10–14; involucre 8–10 mm wide; leaf terminal lobe not elongated.
      17a. Ligules deep yellow; outer phyllaries 2–3 mm wide ...................... 34. T. przewalskii
      17b. Ligules pale yellow; outer phyllaries 1.5–2.2 mm wide .................... 36. T. roseoflavescens
29. Taraxacum eriopodum (D. Don) Candolle, Prodr. 7: 147. 1838.

Herbs 6–13(–20) cm tall, usually small, base whitish to brownish arachnoid. Petiole green, unwinged; leaf blade mid-green to bright green, oblong to broadly obovate, 8–10(–12) × 1.5–2.5 cm, whitish brown arachnoid on outer leaves but ± subglabrous on middle ones, usually lobed or rarely undivided; lateral lobes (when present) 3 or 4 short to moderately long pairs, to 1 × 1 cm, ± patent to recurved, distal margin minutely dentate, apex obtuse; interlobes broad, margin ± entire; terminal lobe rounded-obtuse, 1.5–3 cm, usually broader than lateral lobes, margin entire. Scapes brownish green, ± ovoidal, ± subglabrous and only sparsely arachnoid below capitulum. Capitulum 2.5–3.5 cm wide. Involucre 1.1–1.4 cm wide, base broadly rounded. Outer phyllaries 15–18, blackish green and suffused red (black when dry), subimbricate, ± lanceolate, outermost ones (5.5–)6.5–7.5 × 2–2.5(–3) mm and ca. 1/2 as long as inner ones, appressed, without a paler border, flat to minutely coriaceous below apex; inner phyllaries 1.2–1.4 cm, flat to coriaceous near apex. Ligules yellow, flat; outer ligules outside striped greenish gray; inner ligules with gray or pink apical teeth. Stigmas dark (black when dry). Anthers polliniferous; pollen grains regular in size. Achene dark grayish brown, 4.1–4.4 × 1.1–1.4 mm; body distally subsparingly spinulose, ± smooth below, ± subabruptly narrowing into a 0.6–0.9 mm cone broadly conic at base and subconically distally, spinules small, suberect, and acute; beak ca. 6 mm. Pappus yellowish white, 7–8 mm. Fl. summer. Agamosperm.

Alpine grasslands and pastures; 3800–5000 m. Sichuan, Xizang [India (Sikkim)].

Records of Taraxacum tibetanum from Qinghai and Yunnan (FRPS 80(2): 55. 1999; Higher Pl. China 11: 782. 2005) should be re-examined. The species was reported from W China and Bhutan (Soest, Wenta 10: 51. 1963), but material is outside the limits of T. tibetanum. The description is compiled on the basis of the lectotype (J. D. Hooker s.n.; K, no. det. 8781; a flowering capitulum of the lectotype specimen is depicted in Handel-Mazzetti, Monogr. Taraxacum, pl. II. 1907), the K and BM syntypes fully corresponding to the lectotype, and H. Smith 10711/1 (PRA, UPS). The description of fruit is based on the latter specimen; achene description in the protologue was prepared using another original syntype (J.-A. Soulé 574, K) not conspecific with the lectotype and is disregarded here.


Herbs 12–20 cm tall. Petiole pinkish, narrow to narrowly winged; leaf blade narrowly oblong-obovate, 10–18 × 1.5–3.5 cm, ± glabrous, undivided and remotely lobulato pinnatifidolobed; lateral lobes usually in 3 or 4 pairs, remote, to 1.2 cm, from a broad flat triangular base abruptly narrowed into lingulate lobule, recurved, often reduced to patent lobules; interlobes long, to 1.5 cm wide, margin entire or distal margin with 1 or 2 teeth; terminal lobe ± elongated triangular, 3–5 cm. Scapes brownish green, ± equaling leaves, subglabrous at base but densely whitish brown arachnoid below capitulum. Capitulum 2.5–3 cm wide. Involucrre broadly rounded, 1–1.2 cm wide. Outer phyllaries 11–15, brownish green, ± not imbricate, ovate-lanceolate, outermost ones 5.5–6 × 2.5–3 mm and 1/3–1/2 as long as inner ones, loosely appressed, venation not distinct, unbordered, margin sparsely ciliate, flat below apex; inner phyllaries to 1.4 cm. Ligules yellow; outer ligules flat and outside striped grayish purple; inner ligules with long blackish purple teeth. Stigmas ± black. Anthers without pollen (so far as it can be observed in another original syntype (J.-A. Soulé 574, K) not conspecific with the lectotype and is disregarded here.

Mountain calcareous shrubby slopes; 3100–3400 m. NW Yunnan.

Taraxacum suberiopodum is known from the type material only.

32. Taraxacum atrocarpum Kirschner & Štěpánek, sp. nov.

- Mountain calcareous shrubby slopes; 3100–3400 m. NW Yunnan.

Plants agamospermae phyllariis involucralibus imbricatis numerosis, anguste ovatis usque anguste lanceolatis, arcte apdresiss, pallide marginatis ciliatis eorniculatis, ligulis luteis, stigmaticibus luteis, antheris polline carentibus, achenis nigricantibus crassis, corpore superne dense squamuloso, in pyramide crassam 1.2–1.4 mm longam subabrupte transiente.

Herbs 10–18 cm tall. Petiole greenish or pink, narrow, sparsely arachnoid; leaf blade mid-green, narrowly oblong-ob lanceolate, 5–11 × 1–2 cm, sparsely arachnoid, pinnatisect; lateral lobes 3–5 pairs, narrowly triangular, ± patent to subcurved, proximal margin concave and entire, distal margin sigmoid or straight and often with 1–3 teeth, apex subacute; interlobes narrow, margin entire or denticate; terminal lobe narrowly triangular, elongated. Scapes ± overlapping leaves, sparsely arachnoid. Capsulum 3.5–3.5 cm wide. Involucre 1–1.1 cm wide, base rounded. Outer phyllaries 15–19, blackish green, imbricate, narrowly ovate to narrowly lanceolate, often from an ovate basal part abruptly narrowing into a narrow apical part, outermost ones 4.5–7.5(–8.5) × 2.2–3 mm and ca. 2/5 as long as inner ones, appressed, dark middle part with a ± gradual transition into greenish white 0.3–0.7 mm wide border, margin ciliolate, ± flat below apex; inner phyllaries 1.3–1.5 cm, apex flat. Ligules yellow; outer ligules ± flat, outside striped gray purplish; inner ligules with purplish apical teeth. Stigmas yellow. Anthers without pollen. Achene dark gray to blackish but straw-colored when unripe, 4.1–4.4 × 1.2–1.3 mm; body apically with ± dense squamules, subabruptly narrowing into a ± cylindrical 1.2–1.4 × ca. 0.4 mm cone; beak 6–7 mm. Pappus yellowish white, 5–6 mm. Fl. summer. Agamosperm.

● Alpine meadows; ca. 3200 m. NW Yunnan.

Taraxacum atrocarpum is characterized by yellow stigmas, male sterility, and thick blackish achenes. The other known species without pollen in the section are: Suberopodium and T. delicatum. The former has large (5–5.5 mm) achenes, beak ca. 1 cm, and black stigmas. The latter has more numerous outer phyllaries and black stigmas. Taraxacum centrasiaticum, in which the presence of pollen remains unknown, has only 10 or 11 outer phyllaries with glabrous margin, stigmas blackish green, and achenes with a short (0.7–0.8 mm) cone.

33. Taraxacum mutatum Kirschner & Štěpánek, sp. nov.

変北蒲公英 bian hua pu gong ying


Plantae agamospermae folis pinnatifolibus vel pinnatisectis, lobis lateralis late linearibus rectis patentibus, phyllariis involucralibus exterioribus paucis, lanceolatis usque lineari lanceolatis, pallide viridibus usque atroviridibus, pruinosis, stigmaticibus luteis, achenis subatris, magnis, sensim in pyramidem longam subcylindricam abeuntibus.

Herbs 12–20 cm tall. Petiole ± greenish, narrow, sparsely arachnoid; leaf blade light green to mid-green, linear-ob lanceolate, 6–16 × 0.8–2 cm, sparsely arachnoid, pinnatisect; lateral lobes 3–6 pairs, ± linear-triangular to broadly linear, patent, margin entire or with a single tooth or lobule near base on distal side; interlobes 2–4 mm wide, with 1 or 2 teeth or lobules; terminal lobe narrowly triangular-lingulate, margin often with 1–3 patent teeth or segments, basal segments linear. Scapes greenish, overtopping leaves, sparsely arachnoid but sometimes subglabrous even below capitulum. Capsulum 2.5–3.5 cm wide. Involucre ± pruinose, 0.9–1.1 cm wide, base rounded. Outer phyllaries 9–11(–13), light green to blackish green and grayish pruinose, slightly imbricate, lanceolate to linear-lanceolate, outermost ones 4.5–6.5(–8) × (1.6–)1.9–2.3 mm and ca. 1/2 as long as inner ones, ± appressed to loosely so, with an evident whitish 0.2–0.3 mm wide border, margin ciliate, apex flat; inner phyllaries 1.2–1.5 cm, apex flat. Ligules yellow; outer ligules ± flat, outside striped grayish pink; inner ligules with reddish apical teeth. Stigmas yellow, sometimes with a few darker hairs. Anthers polliniferous; pollen grains irregular in size. Achene dark gray to blackish but straw-colored when unripe, 4.9–5.3 × 1–1.1 mm; body spinulose-squamulose in upper 1/2–2/3, ± gradually narrowing into a subcylindric 1.4–1.7 × ca. 0.3 mm cone; beak ca. 7 mm. Pappus yellowish white, 5–6 mm. Fl. summer. Agamosperm.

● Alpine meadows, grazed alpine grasslands; 3400–3800 m. NW Yunnan.

Taraxacum mutatum is characterized by outer phyllaries pruinose, not numerous, of narrow shape, and ciliate; stigmas yellow; leaves with straight and patent lateral lobes; and achenes large, squamulose, almost black, and with body gradually narrowing into an unusually long cone. Similar agamospermous polliniferous species of T. sect. Tibetana to be compared with T. mutatum are T. tibetanum (stigmas black, cone conic and to 0.9 mm), T. przewalskii (stigmas blackish, cone 0.4–0.6 mm), T. subcoronatum (achene body abruptly narrowing into cone), T. arifolia (stigmas blackish, cone 0.3–0.4 mm), and T. suavis-simium (achenes dark reddish brown).


藏北蒲公英 zang bei pu gong ying

Herbs 5–15 cm tall, subglabrous at base. Petiole purplish at base, narrow; leaf blade mid-green, narrowly oblanceolate, 4–10 × 0.8–1.5 cm, glabrous, shallowly to deeply lobed; lateral lobes 3 or 4 pairs, ± narrowly triangular, recurved, margin entire and on distal side often concave, apex elongated and subacute; terminal lobe triangular, often elongated with subpatent basal segments. Scapes brownish green, ± equaling leaves, glabrous. Capsulum 2–3 cm wide. Involucre blackish, 8–10 mm wide, base ± rounded. Outer phyllaries 10–12, blackish and slightly pruinose, subimbricate, ovate-lanceolate, outermost ones 4–6 × 2–3 mm and 1/5–1/3 as long as inner ones,
appressed, paler border absent, margin glabrous, apex ± flat; inner phyllaries blackish green, 1–1.3 cm. Ligules yellow; outer ligules flat, outside striped pale grayish. Stigmas blackish. Anthers polliniferous; pollen grains irregular in size. Achene (when unripe) brownish, 4–5 mm; body apically distinctively spinulose, subgradually narrowing into a 0.4–0.6 mm cone. Pappus white, ca. 6 mm. Fl. summer. Agamosperm.

- Alpine slopes; ca. 5000 m. Xizang.

Taraxacum przewalskii is known from the type specimens only.


亚冠蒲公英 ya guan pu gong ying

Herbs 8–20 cm tall, brownish hairy at base. Petiole purple, narrow; leaf blade mid-green, narrowly oblanceolate, 4–7 × 0.8–1 cm, sparsely arachnoid, shallowly to deeply lobed; lateral lobes 5–9 pairs, ± triangular-deltoid, ± patent to recurved, margin entire, apex acute; terminal lobe triangular, often elongated. Scapes ± overtopping leaves, base purple, apically brownish white arachnoid. Capitulum 2–3 cm wide. Involucre blackish green, 8–10 mm wide, base ± rounded. Outer phyllaries 11–16, blackish green, not imbricate, narrowly triangular to narrowly lanceolate, usually widest in middle, outermost ones 6–8 × 1.8–2.5 mm and ca. 1/2 as long as inner ones, appressed, with a whitish 0.1–0.2 mm wide border, margin almost not ciliate, apicoplast and ± flat; inner phyllaries blackish green, 1.3–1.5 cm. Ligules pale yellow; outer ligules flat, outside striped grayish pink. Stigmas blackish. Anthers polliniferous; pollen grains irreguler in size. Achene (when unripe) pale brownish, 4–5 mm; body apically spinulose, abruptly narrowing into a cone. Pappus white, ca. 6 mm. Fl. summer. Agamosperm.

- Alpine slopes along rivers; ca. 4500 m. Qinghai or N Xizang.


二色蒲公英 er se pu gong ying

Herbs 5–12 cm tall, slender. Petiole pink or pale green, narrow; leaf blade mid-green, linear-oblanceolate, usually 5–7 × 0.6–0.9 cm, subglabrous, margin subentire to shallowly lobed; lateral segments in 3 or 4 pairs, recurved, distal margin sinuate and downward pointing; terminal lobe often elongated. Scapes pale brownish green, slightly overtopping or equaling leaves, subglabrous or arachnoid below capitulum. Capitulum 2–3 cm wide. Involucre blackish, 8–10 mm wide, base rounded. Outer phyllaries 10–14, blackish green, ± not imbricate, narrowly triangular to narrowly lanceolate, usually widest in middle, outermost ones 5–7 × 0.6–0.9 mm and 2/5–1/2 as long as inner ones, appressed, ± glabrous, paler border absent, apex flat or coniculate; inner phyllaries blackish green, 1.2–1.4 cm. Ligules pale yellow; outer ligules flat, outside striped (grayish) pink; inner ligules with blackish red 0.5–1 mm teeth. Stigmas dark greenish. Anthers polliniferous; pollen grains irregular in size. Achene (when unripe) brownish, ± not imbricate, ovate to lanceolate, outermost ones 4.2–6.5 × 1.3–2 mm and 1/3–1/2 as long as inner ones, loosely appressed, venation not visible, unbordered, margin whitish ciliate, flat below apex; inner phyllaries 1–1.1 cm. Ligules (‘pale’) yellow; outer ligules flat and striped pinkish outside; inner ligules with blackish purple teeth. Stigmas black. Anthers polliniferous; pollen grains regular in size. Achene (mature unknown) probably straw-colored brown, ca. 4 mm, apically sparsely spinulose and subabruptly narrowing into a conic 0.6–0.7 mm cone; beak at least 5 mm. Pappus white, ca. 5 mm. Fl. summer. Sexual.

- Alpine meadows; ca. 4000 m. Sichuan.


The original material of Taraxacum apargiiforme listed by Dahlstedt in the protologue is not homogeneous, and we exclude H. Smith 4196. The figure of the achene in Dahlstedt (loc. cit.: pl. III: 21) is excluded as H. Smith 4196 does not belong to this species and is agamospermous, and the figure is based on a damaged immature achene. Dahlstedt also mistakenly listed H. Smith 4171, not at all present in the original material (he himself gave the correct number, H. Smith 4173, in the caption to fig. 14, c, d).


天全蒲公英 tian quan pu gong ying


Taraxacum apargiiforme f. integrifolium Dahlstedt.

Herbs to 15 cm tall, slender. Petiole pale green or purplish, narrow; leaf blade narrowly oblanceolate, ± glabrous, margin undivided and remotely dentate or pinnatisect; lateral lobes in 4 or 5 pairs, approximate, ± recurved, distal margin sigmoid, apex with an elongated tip; interlobes short, margin entire; terminal lobe ± triangular, with a lingulate tip. Scapes brownish green, overtopping leaves, glabrous. Capitulum ca. 3 cm wide. Involucre obconic, 5–7 mm wide. Outer phyllaries 11–13, blackish green, ± not imbricate, ovate to lanceolate, outermost ones 4.2–6.5 × 1.3–2 mm and 1/3–1/2 as long as inner ones, loosely appressed, venation not visible, unbordered, margin whitish ciliate, flat below apex; inner phyllaries 1–1.1 cm. Ligules (‘pale’) yellow; outer ligules flat and striped pinkish outside; inner ligules with blackish purple teeth. Stigmas black. Anthers polliniferous; pollen grains regular in size. Achene (mature unknown) probably straw-colored brown, ca. 4 mm, apically sparsely spinulose and subabruptly narrowing into a conic 0.6–0.7 mm cone; beak at least 5 mm. Pappus white, ca. 5 mm. Fl. summer. Sexual.

- Alpine meadows; ca. 4000 m. Sichuan.

Plantae graciles, foliis angustis lobo terminali elongato, scapis glabris, involucris aterrimis paucisquamosis glaberrimis, ligulis apice conspicue dentatis, stigmatibus atris, an-
theris polliniferis polline irregulari, achenis obscure griseo-brunneis, magnis, grosse spinulis.

Herbs 7–14 cm tall. Petiole long, narrow; leaf blade mid-green, linear-oblancoate, 6–9(-12) × 0.5–0.9(-1.1) cm, ± glabrous, margin remotely lobulate or shallowly lobed; lateral segments in 1 or 2(3) pairs, subpatent to recurved; terminal lobe elongated, apex subobtuse. Scapes pale brownish green, slightly overtopping leaves, glabrous. Capitulum 3–3.5 cm wide. Involucre blackish, 5–7 mm wide, base narrowly rounded to slightly obconic. Outer phyllaries 5–9, black but often with a reddish apex, subimbricate, ovate-lanceolate to narrowly lanceolate, outermost ones 4.2–4.5 × 1–1.2 mm; body apically with distinct erect spinules and squamules, subgradually narrowing into a conic 0.7–0.9 mm cone; beak 6–6.5 mm. Pappus slightly yellowish white, 5–6 mm. Fl. summer. Agamosperm.

● Alpine meadows; 3700–4200 m. W Sichuan.

Taraxacum apargia is similar to T. apargiforme but differs in having involucre rounded at base, outer phyllaries usually with a very narrow paler border, achenes ± densely covered with distinct spinules and squamules above, pollen irregular, and agamospermous reproduction.


川西蒲公英 chuan xi pu gong ying

Herbs 7–9 cm tall, delicate. Petiole greenish or pinkish, narrow; leaf blade deep green, oblancoate, 2.5–5 × 1–1.5 cm, subglabrous, margin shallowly pinnatifid; lateral lobes 3 or 4 pairs, narrowly triangular, ca. 5 mm, approximate, patent, distal margin entire or with 1 minute tooth; interlobes short, margin sometimes with 1 tooth or lobule; terminal lobe ± broadly triangular. Scapes slightly overtopping leaves, densely arachnoid below capitulum. Capitulum 2–3 cm wide. Involucre ± blackish green, 5–7 mm wide, base narrowly rounded. Outer phyllaries 9–13, ± black, ± not imbricate, lanceolate to deeply ciliate; lateral lobes 3 or 4 pairs, narrowly triangular, ca. 5 mm, approximate, patent, distal margin entire or with 1 minute tooth; interlobes short, margin sometimes with 1 tooth or lobule; terminal lobe ± broadly triangular. Scapes slightly overtopping leaves, densely arachnoid below capitulum. Capitulum 2–3 cm wide. Involucre ± blackish green, 5–7 mm wide, base narrowly rounded. Outer phyllaries 9–13, ± black, ± not imbricate, lanceolate to narrowly lanceolate, outermost ones 4.8–5.8(–8) × 1.3–1.8 mm, unequal, and ca. 1/3(–2/3) as long as inner ones, appressed to apically recurved, with a whitish indistinct border becoming pinkish and 0.3–0.4 mm wide near apex, margin densely long ciliate, apex flat and not corniculate; inner phyllaries blackish green, 1.1–1.3 cm. Ligules (?pale) yellow; outer ligules flat, outside striped greenish pink; inner ligules with dark blackish 0.5–0.7 mm teeth. Stigmas black. Anthers polliniferous; pollen grains irregular in size. Achene dark grayish olivaceous but straw-colored when unripe, 4.2–4.5 × 1–1.2 mm; body apically with distinct erect spinules and squamules, subgradually narrowing into a conic 0.7–0.9 mm cone; beak 6–6.5 mm. Pappus slightly yellowish white, 5–6 mm. Fl. summer. Agamosperm.

● Alpine meadows; ca. 4600 m. NW Sichuan.

The scarcity of material (absence of achenes and broad white border to outer phyllaries) make the position of Taraxacum chionophilum in T. sect. Tibetana rather uncertain.


柳叶蒲公英 liu ye pu gong ying

Herbs ca. 12 cm tall, slender. Petiole pale green to pinkish, narrow; leaf blade mid-green, linear-oblancoate, 4–6 × 0.5–0.6 cm, ± glabrous, margin ± entire but sometimes remotely minutely denticulate, apex subobtuse. Scapes pale green, overtopping leaves, arachnoid below capitulum. Capitulum ca. 2.5 cm wide. Involucre blackish green, ca. 7 mm wide, base ± rounded. Outer phyllaries 9 or 10, ± black, ± not imbricate, lanceolate to narrowly lanceolate, outermost ones 4–6 × ca. 1.2 mm and 1/3–1/2 as long as inner ones, ± loosely appressed, paler border absent, margin sparsely ciliate, apex flat; inner phyllaries blackish, ca. 1 cm. Ligules yellow; outer ligules flat, outside striped dark gray-purple. Stigmas dark green to blackish.
Anthers polliniferous; pollen grains irregular in size. Achene unknown. Fl. summer. Agamosperm.

- Wet alpine sites; ca. 4200 m. S Xizang (Gyangzê).

*Taraxacum staticifolium* is known from a single type plant, which was mistakenly reported to have pollen absent.

### 42. *Taraxacum delicatum* Kirschn. & Štěpán, sp. nov.

**Rou ruo pu gong ying**


**Paratypes:** China. Qinghai: “Tongde Xian [同德县]. Long-muer Xiuma, between Jungong (Gyumgo) and Hebei on the N side of the Huang He,” 3650 m, 22 Jul 1993, *Ho Ting-nung, B. Bartholomew & M. Gilbert* 174 (CAS, PE, duplicate at HNWP not seen).

*Plantae agamospermae delicatae, subunicatae, foliis profunde pinnatisectis vel pinnatifidatis, lobis laterales angustis, patentibus, sigmoideis, subintegris, petiolis purpureis funde pinnatisectis vel pinnatifidatis, lobis laterales anenticis, stigmatibus ± black. Antheris polliniferis; pollen grains irregular in size. Achene dark ochraceous brown but later probably dark brown, 3.6–3.9 × ca. 0.9 mm; body tuberculate below, ± densely spinulose above, subapruptly narrowing into a thick subconic 0.7–0.8 mm cone, spinules thin, suberect, and acute; beak 5–6 mm. Pappus ± white, 5–6 mm. Fl. summer.

- Alpine meadows; 3400–3500 m. S Xinjiang.

### 44. *Taraxacum austrotibetanum* Kirschn. & Štěpán, sp. nov.

**Zang nan pu gong ying**

**Type:** China. Xizang: “Tibet meridionalis, ca. 55 km situ occid a Gongbo-Gyamda [工布江达],” ca. 4000 m, 29 Jul 1992, *L. Businská & R. Businský* 12, cultivated as JŠ 5099 (holotype, PRA; isotype, PRA).

*Plantae laminis foliorum glaberrimis, phyllaris involucralibus externis lineari-lanceolatis usque anguste lanceolati, atro-viridibus ecornculatis dense ciliati immarginati, ligulis externis itus abius, centralibus pallide flavescentibus, stigma-ibus grisco-viridibus, et praeceptae achenis bade-rubris vel ochraceo-badio-rubris, omneo grosse spinulis, spinulis sub-erectis vel saepissime sursum arcuatis falciformibus insignis. &

Herbs 12–22 cm tall. Petiole usually suffused purplish, long, unwinged; leaf blade deep green, ± linear to linear-oblan-ceolate, 8–14 × 0.7–2 cm, glabrous, usually deeply divided to midvein; lateral lobes 2–4 pairs, linear to rarely linear-triangular, 5–9 × 1.8–2.5 mm, remote, recurved or ± patent, margin entire; interlobes long, 1.1–1.5 × (–)0.5 mm wide, margin entire; terminal lobe ± 3-partite, basal segments ± recurved, terminal segment elongated, 3–6 mm wide, and margin entire. Scapes brownish green and often suffused purplish, much overtopping leaves, sparsely arachnoid to subglabrous. Capitulum 1.5–2 cm wide. Involucre 5.5–9 mm wide, base ± rounded to slightly sub-oblanceolate. Outer phyllaries 10 or 11, blackish green, ± imbricate, narrowly lanceolate to ovate-lanceolate, outermost ones 4.6–6 × 1.3–2 mm and 1/3–2/5 as long as inner ones, ± appressed, with an evident ± white ca. 0.2 mm wide border, margin glabrous, flat below; inner phyllaries blackish green, 0.9–1.3 cm, flat below apex. Ligules yellow; outer ligules flat, outside striped purplish; floret tube glabrous or sparsely pubescent. Stigmas blackish green. Achene dark ochraceous brown but later probably dark brown, 3.6–3.9 × ca. 0.9 mm; body tubercul-ate below, ± densely spinulose above, subapruptly narrowing into a thick subconic 0.7–0.8 mm cone, spinules thin, suberect, and acute; beak 5–6 mm. Pappus ± white, 5–6 mm. Fl. summer.

- Alpine meadows; 3000–3700 m. Gansu.
spicuous, and to 0.1 mm wide, margin ± densely whitish to yellowish ciliate, apex flat; inner phyllaries 1.2–1.4 cm, apex flat. Ligules white; outer ligules ± flat, outside striped light grayish purple; inner ligules ± pale yellowish, with grayish purple apical teeth. Stigmas gray-green. Anthers polliniferous; pollen grains irregular in size. Achene reddish brown to ochraceous reddish brown when fully ripe, 3.9–4.2 × ca. 1.1 mm; body densely spinulose throughout, less densely at base, subapruptly narrowing into a subcylindric 0.8–1 mm cone, spinules coarse, erect to sicle-shaped pointing upward, and usually laterally compressed; beak ca. 6 mm. Pappus pale yellowish white, ca. 6 mm. Fl. summer. Agamosperm.

- Alpine meadows; ca. 4000 m. S Xizang.

Taraxacum austrotibetanum is distinct in having white florets, ± densely ciliate narrow outer phyllaries, and reddish brown achenes with a conspicuous spinulosity. Taraxacum roseoflavescens differs from it in glabrous outer phyllaries and leaf shape. Taraxacum przewalskii and T. tibetanum differ from T. austrotibetanum in their yellow floret color. Taraxacum przewalskii also differs in its ovate-lanceolate, 4–6 mm wide outer phyllaries and T. tibetanum in its glabrous outer phyllaries.

45. Taraxacum suavissimum Kirschner & Štěpánek, sp. nov.

甜蒲公英  tian pu gong ying


Plantae foliis demum pinnatisectis lobis lateralibus saepe sursum curvatis, in parte distali linearibus, interlobis integris vel uni- vel bilobulatis, phyllariis involucralibus exterioribus non imbricatis anguste lanceolatis usque lineari-lanceolatis, adpressis, minute corniculatis, capitulum 3–4 cm wide. Involucrum 1–1.2 cm wide, base ± rounded. Outer phyllaries (9–)11–15(–17), dark blackish green, ± not imbricate, narrowly lanceolate to ± linear-lanceolate, outermost ones 5–6(–8) × (1–1.7)–2.2 mm and 1/3–1/2 as long as inner ones, appressed, paler border not developed, margin ± ciliate, apex usually minutely corniculate; inner phyllaries 1.2–1.5 cm, apex ± minutely blackish corniculate. Ligules pale yellowish white; outer ligules ± flat, outside striped grayish purple; inner ligules with grayish purple apical teeth. Stigmas grayish green. Anthers polliniferous; pollen grains irregular in size. Achene initially (when almost ripe) light ochraceous red but finally turning dark grayish reddish brown, (4.3–)4.6–4.9(–5.1) × 1.2–1.3 mm; body densely spinulose in upper half, subgradually narrowing into a ± cylindrical 0.8–1.1 × ca. 0.4 mm cone, spinules distinct, straight, and erect-patent; beak 8–9 mm. Pappus pale yellowish white, ca. 7 mm. Fl. summer. Agamosperm.

- Mountain grasslands, along paths; 3300–4200 m. NW Yunnan.

Taraxacum suavissimum differs from the other agamospermous T. sect. Tibetana species with comparable outer phyllaries and leaf shape. It differs from T. apargia, which has dark grayish olivaceous achenes (without reddish color), from T. delictum, which has pollen absent and has a different fruit color and size, and from T. austrotibetanum, which has reddish brown achenes and white florets. From outside the limits of the section, T. sikkimense of T. sect. Emodensia has distinctly bordered outer phyllaries and a longer cone.


喜马拉雅蒲公英组  xi ma la ya pu gong ying zu

Type: Taraxacum sherriffii Soest.

Sectio distincta phyllariis involucralibus exterioribus plerumque numerosis, adpressis vel late adpressis, lineari-lanceolatis usque linearibus, conspicue cornuti vel corniculati, saepissime distincte anguste pallide marginati, flosculi plerumque lutei, stigmatibus non atro-griseis, plerumque pallide virescentibus, achenis colore variantibus (stramineis, rubro-badosi, ochraceis vel atro-griseis), corpore plerumque crasso, 1–1.4 mm lato, superne dense spinuloso, spinulæ medioribus rectis erecto-patentibus, in pyramide vulgo crassam subcylindricam saepissime (0.8–)1–1.4(–1.9) mm longam subabrupte transiente, rostro plerumque 5–7 mm longo, pappo albo.

Petiole narrow; leaf blade deeply pinnatisect. Involucrum 6–10 mm wide, base usually narrowly rounded. Outer phyllaries usually numerous (to 25), deep green to dark green, linear-lanceolate or linear, appressed or loosely so, usually distinctly pale bordered, apex conspicuously horned or corniculate. Ligules usually yellow, rarely whitish. Stigmas yellow to yellowish green. Achenes variously colored, straw-colored brown, dark red-brown, ochraceous, or dark blackish gray; body ± densely spinulose above, usually subapruptly narrowing into a usually subcylindric (0.8–)1–1.4(–1.9) mm cone, spinules straight and erect to erect-patent; beak usually 5–7 mm. Pappus white. Sexual or agamospermous.
About 12–15 species: China, India, Nepal; 11 species (ten endemic) in China.

The diversity of *Taraxacum sect. Emodensia* is centered in Sichuan and Xizang.

**Taraxacum heteroloma** Handel-Mazzetti (Monogr. Taraxacum, 120. 1907) is a name based on a very heterogeneous set of syntypes, of which some come from Xizang. Most of the syntypes belong to *T. sect. Emodensia*, but we were not able to select any lectotype that would be in accordance with the original description. None of the taxa recognized below can be equated with the well-developed syntypes. As a consequence, the name is not used in the present treatment and the problem remains to be studied. Another name reported from China (FRPS 80(2): 52. 1999) is *T. pseudo-stenoceras* Soest (Bull. Brit. Mus. (Nat. Hist.), Bot. 2: 271. 1961). Its type material belongs to *T. sect. Emodensia*, but we failed to find any Chinese material safely referable to this taxon. The name *T. kansuense* Nakai ex Koidzumi (Bot. Mag. (Tokyo) 50: 91. 1936) may belong to *T. sect. Emodensia*. However, the description is imperfect, lacking achenes, and, most importantly, the type material is not currently extant, there is not enough information to deal with the name in detail. The name *T. kawaguchii* Kitamura (Acta Phytotax. Geobot. 15: 77. 1953) is based on a plant deposited in TNS. The specimen and the original description clearly show that the name belongs to *T. sect. Emodensia*. However, the type plant is not well preserved, and there are no achenes. We therefore are unable to complete the taxonomic study of this name or taxon.

1a. Pollen grains regular in size (plants sexual).
   2a. Achene 3–3.5 mm, cone subconic and 0.4–1 mm ................................................................. 54. *T. deludens*
   2b. Achene 4.8–5.2 mm, cone cylindric and 1.2–1.9 mm ............................................................. 55. *T. macula*

1b. Pollen grains irregular in size (plants agamospermous).
   3a. Achene red to reddish brown ............................................................... 56. *T. sikkimense*
   3b. Achene of different color.
      4a. Paler border to outer phyllaries absent or indistinct and very narrow.
         5a. Outer phyllaries 0.9–1.3 mm wide; stigmas blackish; leaf lateral lobes conspicuously recurved ............................................................. 47. *T. maurocarpum*
         5b. Outer phyllaries 1.5–2 mm wide; stigmas dirty green; leaf lateral lobes patent to slightly recurved ............................................................. 53. *T. ludlowii*

4b. Paler border to outer phyllaries distinct and at least 0.2–0.3 mm wide.
   5a. Achene grayish straw-colored brown, yellowish straw-colored brown, or light ochraceous straw-colored brown.
      6a. Achene greyish straw-colored brown, yellowish straw-colored brown, or light ochraceous straw-colored brown.
         7a. Outer phyllaries 22–25 ................................................................. 46. *T. stenoceras*
         7b. Outer phyllaries 11–18.
            8a. Outer phyllaries 2.5–3.5 mm wide, apex flat to corniculate; stigmas light brownish yellow ...... 48. *T. kozlovii*
            8b. Outer phyllaries 1.5–2.5 mm wide, apex conspicuously horned; stigmas grayish green ................................................................. 50. *T. glaucophylloides*

6b. Achene of different color and darker.
   9a. Achene 3.5–4 mm, cone 0.8–0.9 mm; outer phyllaries with pale 0.2–0.3 mm border ........... 49. *T. glaucophyllum*
   9b. Achene 4.5–5.9 mm, cone 1–1.5 mm; outer phyllaries with paler 0.3–0.5 mm border.
      10a. Achene blackish grayish brown ............................................................. 51. *T. sherrifii*
      10b. Achene deep cinnamon brown ............................................................. 52. *T. badiocinnamomeum*


**灰果蒲公英** hui guo pu gong ying

Herbs 15–20 cm tall. Petiole pinkish, ± unwinged; leaf blade light green, narrowly oblong-cylindric, 7–14(–17) × 1.2–3 cm, sparsely arachnoid, pinnatilobed to pinnatisect, midvein pinkish; lateral lobes (3 or) 4–7 pairs, usually hamate-recurved, 1.5–2 cm, narrow, margin apically sparsely, minutely, or coarsely dentate (to lobulate) or rarely entire; interlobes short, margin entire, dentate, or lobulate; terminal lobe helmet-shaped to triangular, 1.5–2 × 1.2–2.2 cm, margin usually entire. Scapes brownish green, ± equaling leaves, sparsely arachnoid at base but densely arachnoid below capitulum. Capitulum 3–4 cm wide. Involucr 5–7 mm wide, base narrowly rounded. Outer phyllaries 22–25, pale green, ± not imbricate, linear-cylindric, outermost ones 7–8 × 1.2–1.8 mm and ca. 3/4 as long as inner ones, ± subapressed, with a paler 0.2–0.3 mm wide border, margin glabrous to sparsely ciliate, apex with a thin perpendicula ca. 5 mm horn; inner phyllaries 5–7 mm, with a thin horn below apex. Ligules (pale) yellow; outer ligules flat, outside striped purplish; inner ligules with purple teeth; floret tube outside pubescent. Stigmas dirty yellow to greenish. Anthers polliniferous; pollen grains irregular in size. Achene grayish straw-colored brown, 3.8–4.4 × 1–1.2 mm; body apically spinulose, ± gradually narrowing into a subconic ca. 1.2 mm cone; beak 6–7 mm. Pappus ± white, 5–6 mm. Fl. summer. Agamosperm.

* Disturbed mountain grasslands; 3000–3600 m. NW Sichuan.


**灰果蒲公英** hui guo pu gong ying

Herbs 5–6 cm tall, delicate. Petiole narrow; leaf blade deep green, broadly linear, 3–5.5 × 0.6–0.9 cm, sparsely arachnoid, deeply lobed; lateral lobes 3–5 pairs, narrowly triangular, recurved, margin entire; interlobe margin entire; terminal lobe elongated sagittate. Scapes ± overtopping leaves, sparsely arachnoid but more densely arachnoid below capitulum. Capitulum ca. 2.5 cm wide. Involucr ± narrowly rounded to broadly ob-
conic, 6–7 mm wide. Outer phyllaries 14–19, blackish green, linear-lanceolate, outermost ones 5–9 × 0.9–1.3 mm, unequal, and 1/3–2/3 as long as inner ones, loosely appressed, with a paler indistinct ca. 0.2 mm wide border, margin sparsely ciliate, apex attenuate and with a evident blackish 0.7–1 mm horn; inner phyllaries blackish, 1.1–1.2 cm. Ligules yellow; outer ligules flat, outside striped grayish purple; inner ligules with blackish teeth. Stigmas blackish. Anthers polliniferous; pollen grains irregular in size. Achene blackish brown, 3.3–3.7 × ca. 1 mm; body apically minutely spinulose, subabruptly narrowing into a subconic 1–1.1 mm cone; beak ca. 7 mm. Pappus yellowish white, 5–6 mm. Fl. summer. Agamosperm.

- Alpine grasslands; ca. 4000 m. W Sichuan.

We did not see material confirming reports of *Taraxacum maurocarpum* from Qinghai, Xizang, and Yunnan (FRPS 80(2): 70. 1999; Higher Pl. China 11: 785. 2005).


大剥蒲公英 da ci pu gong ying

Herbs 5–20 cm tall. Petiole purplish, ± unwinged but dilated at very base; blade leaf light green to grayish green, narrowly oblanceolate, 5–15 × 1.5–2 cm, subglabrous, remotely pinnatifoliate, midvein pale green; lateral lobes 2 or 3(or 4) pairs, to 1 cm, narrow, usually recurved to patent, margin usually entire; interlobes long, margin entire; terminal lobe elongated, to 5 cm, margin usually entire. Scapes brownish green, ± overtopping leaves, sparsely arachnoid below capitulum. Capitulum 3–4 cm wide. Involucre 7–11 mm wide, base ± rounded. Outer phyllaries 14–18, pale green to deep green, ± not imbricate, linear-lanceolate, outermost ones 8–9 × 2.5–3.5 mm and ca. 4/5 as long as inner ones, ± loosely appressed with whitish narrow border 0.3–0.4 mm, margin ± glabrous, flat or indistinctly coniculate below apex; inner phyllaries 1.3–1.6 cm, flat to coniculate below apex. Ligules yellow; outer ligules flat, outside striped grayish pink; inner ligules with purple to blackish teeth. Stigmas discolored, brownish yellow. Anthers polliniferous; pollen grains probably slightly irregular in size. Achene (when unripe) yellowish straw-colored brown, 4–4.4 × 1.4–1.6 mm; body apically densely coarsely spinulose with acute spinules and squamules, ± tuberculose to smooth below, abruptly narrowing into a conic 1.1–1.3 mm cone; beak ca. 6 mm. Pappus dirty white, ca. 5 mm. Fl. summer. Probably agamosperm.

- Alpine grasslands; probably above 2500 m. N Gansu.

*Taraxacum kozlovii* is known only from the type specimen.


灰叶蒲公英 hui ye pu gong ying


*A specie valde simili, Taraxaco glaucophylo Soest, plantae nostrae praecipue phyllariis involucralibus exterioribus longioribus, densius ciliatis, acheniis stramineis vel ochraceostriatis, longioribus, omnino notabiliter densius spinulosus, in pyramide subcrescere 1–1.2 mm longam abeuntibus different.*

Herbs 10–15 cm tall. Petiole purple, unwinged; leaf blade light grayish green often suffused purplish, linear to ± oblong-linear, 5–10 × 0.7–1.6 cm, sparsely arachnoid, usually pinnatifoliated to pinnatisect; lateral lobes or teeth 3–5 pairs, ± linear-triangular, slightly pointing upward or patent, margin entire; interlobes ± broad, margin entire; terminal lobe triangular to narrowly triangular, margin entire, basal segments usually obtuse and ± patent. Scapes purplish green, equaling leaves, arachnoid. Capitulum 2.5–3 cm wide. Involucre 9–10 mm wide, base narrowly rounded. Outer phyllaries usually 11–15, ± not imbricate, narrowly lanceolate to ± linear-lanceolate, outermost ones 7–10 × 1.5–2.5 mm and ca. 2/3 as long as inner ones, appressed to ± loosely appressed or erect, middle part blackish green, border evident, paler, greenish white or white often suffused purplish near apex, and ca. 0.5 mm wide, margin ciliate, apex
with large blackish purple horn; inner phyllaries 1.3–1.6 cm, apex purple and with a large blackish horn below it. Ligules yellow; outer ligules ± flat, outside striped blackish purple; inner ligules with ± yellow long apical teeth. Stigmas grayish green. Anthers polliniferous; pollen grains irregular in size. Achene straw-colored brown to slightly ochraceous straw-colored brown when fully ripe, ± laterally compressed, 4–4.5 × 1.3–1.5 mm; body densely spinulose throughout but particularly on ridges, subappruptly to ± abruptly narrowing into a thick ± cylindric 1–1.2 × ca. 0.4 mm cone, spinules crowded and erect to bent upward; beak 7–8 mm. Pappus pale yellowish white, 6–7 mm. Fl. summer. Agamosperm.

- Disturbed grasslands; 3500–3600 m. Xizang.

Taraxacum glaucophyllodium is similar to T. glaucophyllum but has totally different achenes.


拉萨蒲公英 la sa pu gong ying

Herbs 12–15 cm tall, base often thickened by remnants of old petioles. Petiole pale green, ± unwinged; leaf blade mid-green to slightly grayish green, narrowly oblanceolate to broadly linear in outline, 10–13 × 1.5–1.8 cm, sparsely arachnoid, pinnatifid to pinnatisect but some almost undivided, midvein pale green; lateral lobes of inner leaves 3–5 pairs, linear-triangular, narrow, usually ± patent to recurved, margin entire or distal side with a single tooth on base; interlobes long, narrow, to 1.5 × 0.3 cm, margin entire; terminal lobe subobtuse, margin usually entire, basal segments ± patent. Scapes brownish green, ± equaling leaves, sparsely arachnoid to subglabrous. Capitulum 2–2.5 cm wide. Involucre 7–10 mm wide, base ± rounded. Outer phyllaries (11–)13–19, blackish green, ± not imbricate, linear-lanceolate, outermost ones 5–8 × 1.3–2 mm and ca. 3/4 as long as inner ones, ± appressed, with a whitish narrow ca. 0.4 mm border, margin glabrous to sparsely ciliate, apex with a conspicuous horn; inner phyllaries 1–1.2 cm, callose below apex. Ligules yellow; outer ligules flat, outside striped pinkish gray; inner ligules with grayish purple teeth. Stigmas slightly grayish or greenish pale yellow. Anthers polliniferous; pollen grains irregular in size. Achene light gray straw-colored brown when unripe but later getting darker and becoming blackish gray(-brown), 4.5–5.9 × 1.1–1.4 mm; body spinulose in upper 1/2–3/5 on ridges and apically also elsewhere, ± subgradually narrowing into a cylindric 1–1.5 mm cone, spinules thick and acute; beak 4–5.5 mm. Pappus ± white, ca. 6 mm. Fl. late spring. Agamosperm.

- Alpine calcareous meadows; 3800–4300 m. S Xizang.

Taraxacum badiocinnamomeum is similar to T. sherriffii but has a substantially different achenecolor.


林周蒲公英 lin zhou pu gong ying

Herbs to 35 cm tall. Petiole purplish, to 10 cm, ± unwinged; leaf blade mid-green, narrowly oblanceolate, 15–20 × 1.6–2.5 cm, ± glabrous, pinnatifid, midvein pale green or pinkish; lateral lobes 4–6 pairs, triangular, to 1.2 cm, usually ± patent to ± recurved, margin usually entire or rarely with a single tooth or lobule, base broad, apex attenuate and acute; interlobes 10–13 × 5–8 mm, margin entire or rarely with a single tooth or lobule; terminal lobe narrowly triangular-sagittate, elongated to 3.5 cm, margin usually entire, apex acute.
Scapes brownish green but purplish at base, overtopping leaves, arachnoid below capitulum. Capitulum 3–4 cm wide. Involucr 1–1.5 cm wide, base rounded. Outer phyllaries 13–18, dark (blackish) green, ± not imbricate, linear-lanceolate, outermost ones 6–8(–10) × 1.5–2 mm and 2/3–3/4 as long as inner ones, ± appressed, with a pale almost indistinct very narrow border, margin glabrous to sparsely ciliate, with a horn below apex; inner phyllaries 1.2–1.4 cm, with a broad membranous margin, corniculate below apex. Ligules yellow; outer ligules flat, outside striped grayish pink; inner ligules with blackish purple teeth. Stigmas dirty green. Anthers polliniferous; pollen grains probably irregular in size. Achene unknown. Fl. summer.

- Mountain grassland slopes; ca. 4200 m. Xizang (Lhünzhub).

**Taraxacum ludlowii** is known only from the type specimen. Reports of collections from other counties in Xizang (FRPS 80(2): 71. 1999) are incorrect.

54. **Taraxacum deludens** Kirschner & Štěpánek, sp. nov.

假蒲公英 jia pu gong ying

Type: China. Sichuan: “Sikang [西康], Taofu [道孚] distr., Taofu, in terra ‘loess,’” 3000 m, 16 Sep 1934, H. Smith 11458 (holotype, UPS; isotype: PRA).

Paratypes: China. Sichuan: “Sikang [西康], Taofu [道孚], Taining (Ngata),” H. Smith 11088 (PRA, UPS); H. Smith 12210 (PRA, UPS); H. Smith 12015 (CAS, UPS); H. Smith 11865 (UPS); H. Smith 11758 (UPS); H. Smith 11920 (UPS).

Planta sexualis foliis pinnatisectis, phyllaribus involucralibus exterioribus lineari-triangularibus cornutis, viridibus usque atro-violaceis, ligulis apice conspicue denticulatis, stigmaticibus viridibus, acheniis stramineo-brunneis usque atro-badiis, usque ad 6 mm longis, 1.1–1.4 mm crassis, pyramide cylindrica, usque ad 1.9 mm longa.

Herbs 5–13 cm tall, delicate. Petiole pale green or sometimes pinkish, ± unwinged; leaf blade mid-green, narrowly oblancoolate in outline, 2–8 × 0.8–1.5(–2.3) mm, sparsely arachnoid, pinnatifid lobes to pinnatisect, midvein pale green or purplish; lateral lobes 2–5 pairs, variably shaped from hamate-triangular to linear-triangular, 2–13 mm, strongly recurved or rarely to ± patent, margin usually entire or rarely sparsely denticate, apex ± obtuse; interlobes short, narrow, margin entire or with 1 or 2 minute teeth; terminal lobe narrowly helmet-shaped to lingulate, margin entire, apex subobtuse. Scapes pale brownish green, equaling to overtopping leaves, usually densely arachnoid. Capitulum 2–4 cm wide. Involucr 3–5 mm wide, base obconic. Outer phyllaries 10–16, green to blackish green, ± not imbricate, linear to linear-triangular with attenuate apex, outermost ones 3.5–6.5 × 0.7–1.2 mm and 1/3–2/5 as long as inner ones, ± appressed, some recurved at apex, ± unbordered or indistinctly bordered, margin densely ciliate, apex ± flat to callose; inner phyllaries 1.1–1.5 cm, apex ± flat. Ligules (pale) yellow; outer ligules ± flat, outside striped grayish pink; inner ligules with long apically blackish or yellow teeth. Stigmas green. Anthers polliniferous; pollen grains regular in size. Achene gray, straw-colored brown, yellowish, blackish brown, or brick red, 3–3.5 × 1–1.2 mm; body distally subsparingly spinulose, finely squamulose, or ± smooth below, subabruptly narrowing into a subconic 0.4–0.8(–1) mm cone; beak 6–7.5 mm. Pappus yellowish white, 4–5 mm. Fl. late summer. Sexual.

- Mountain grasslands, trail margins, open ground; 3000–3700 m. W Sichuan.

**Taraxacum deludens** is a variable sexual representative of **T. sect. Emodensis**. It is similar to **T. maurocarpum** and **T. stenoceras**. It differs from both in its sexual reproduction, from the former by darker stigmas and much shorter cone, and from the latter by much shorter achenes and cone.

55. **Taraxacum macula** Kirschner & Štěpánek, sp. nov.

斑点蒲公英 ban dian pu gong ying

Type: China. Sichuan: “Sikang [西康], Kangting [康定] (Tachienlu), mont. occid., in prato aprico, graminoso,” 3200 m, 15 Jul 1934, H. Smith 10470 (holotype, UPS; isotype: PRA).


Planta sexualis foliis pinnatisectis, phyllaribus involucralibus exterioribus lineari-triangularibus attenuatis, ± planis, dense ciliatis, ± immarginatis, stigmaticibus viridibus, acheniis stramineo-brunneis usque atro-badiis, usque ad 5.2 mm longis, 1.1–1.4 mm crassis, pyramide cylindrica, usque ad 1.9 mm longa.

Herbs 6–15 cm tall, slender. Petiole green but grayish purple at very base, unwinged; leaf blade mid-green, narrowly oblancoolate in outline, 3–9 × 0.8–1.9 cm, sparsely arachnoid, usually pinnatisect but sometimes almost undivided, midvein usually pale green; lateral lobes 3–7 pairs, usually linear-triangular, to 9 mm, subpatent to recurved, distal margin usually sigmoid and entire; interlobes usually short, narrow; terminal lobe narrowly triangular-sagittate, terminal segment often elongated and 2–2.5 cm and margin entire. Scapes pale brownish green, equaling to overtopping leaves, usually densely arachnoid. Capitulum 2–4 cm wide. Involucr 5–6 mm wide, base obconic. Outer phyllaries 10–16, green to blackish green, ± not imbricate, linear to linear-triangular with attenuate apex, outermost ones 3.5–6.5 × 0.7–1.2 mm and 1/3–2/5 as long as inner ones, ± appressed, some recurved at apex, ± unbordered or indistinctly bordered, margin densely ciliate, apex ± flat to callose; inner phyllaries 1.1–1.5 cm, apex ± flat. Ligules (pale) yellow; outer ligules ± flat, outside striped grayish pink; inner ligules with long teeth grayish purple at apex. Stigmas green. Anthers polliniferous; pollen grains regular in size. Achene brown to blackish brown, 4.8–5.2 × 1.1–1.4 mm; body usually ± smooth below, distally with erect acute subsparsely spinules, ± abruptly narrowing into a cylindric 1.2–1.9 mm cone; beak ca. 7 mm. Pappus yellowish white, ca. 5 mm. Fl. summer. Sexual.

- Alpine meadows and grasslands; 3200–4500 m. W Sichuan.

**Taraxacum macula** is another sexual representative of **T. sect. Emodensis**. It is distinct in having an unusually long cylindric cone; outer phyllaries very narrow, distally attenuate, and densely ciliate; and, as a rule, distinctly pinnatisect leaves.

锡金蒲公英  xi jin pu gong ying


Herbs (2.5–)6–10(–12) cm tall. Petiole usually purplish, unwinged; leaf blade ± mid-green, narrowly oblong-lanceolate in outline, 2.5–8(–12) × 0.9–1.5 cm, ± sparsely arachnoid, pinnatisect, midvein usually purplish; lateral lobes 3 or 4 pairs, narrowly triangular, strongly recurved, proximal margin ± straight and entire, distal margin at base straight or convex and entire, apex subacute to subobtuse; interlobes long, narrow; terminal lobe narrowly triangular-sagittate or almost 3-partite, margin entire, apex often obtuse. Scapes brownish green, ± equalling leaves, arachnoid. Capitulum 2–3 cm wide. Involucre 0.9–1.2 cm wide, base narrowly rounded. Outer phyllaries 13–19, ± blackish green, subimbricate, linear-triangular to linear-lanceolate, outermost ones 4.5–6 × 1.3(–2) mm and 1/3–1/2 as long as inner ones, ± subglabrous, with a whitish to pinkish 0.2–0.3 mm bordered gradual transition into a dark middle band, ± flat or calllose below apex; inner phyllaries black-green, 1.1–1.4 cm, apex ± flat. Outer ligules whitish to whitish yellow, ± flat, outside striped purplish; inner ligules pale yellow. Stigmas blackish to dark grayish green. Anthers polliniferous; pollen grains irregular in size. Achene deep red, 4.5–4.8 × 1.1–1.1 mm; body ± smooth below, distally densely spinulose, ± abruptly narrowing into a cylindric 1.3 mm cone, spinules suberect and acute; beak 5–6 mm. Pappus white to slightly yellowish white, ca. 6 mm. Fl. summer. Agamosperm.

Alpine grasslands; 3800–5000 m. Xizang [India (Sikkim), Nepal].

*T. sikkimense* is also reported from Qinghai, Sichuan, and Yunnan (FRPS 80(2): 58. 1999; Higher Pl. China 11: 783. 2005), but more evidence is needed.


蒙古蒲公英组  meng gu pu gong ying zu


Plant base whitish arachnoid. Middle leaves usually arachnoid. Petiole unwinged to narrowly winged; leaf blade deeply lobed. Scapes usually arachnoid. Capitulum pointing upward after anthesis. Involucre base rounded. Outer phyllaries 9–17, light green or grayish straw-colored brown, deep brown, straw-colored olivaceous, or rarely reddish, 4–6 × (0.9–)1.1–1.4(–2) mm; body frequently unbordered or pale bordered, margin usually densely ciliate. Ligules light yellow, yellow, or rarely white. Achene usually pale yellow, ± flat, outside striped purplish; inner phyllaries black-green, ± smooth below, distally densely spinulose, ± abruptly narrowing into a cylindric 1–1.3 mm cone, spinules suberect and acute; beak 6–10 mm, thin. Pappus white or yellowish, (4–)6–8 mm.

About 45 species: centered in Japan and NE China; 11 species (nine endemic) in China.

A number of specific names, based on specimens from China belonging to this section, remain unclear.

The names *Taraxacum mongolicum* var. *caninum* G. Jacot, *T. mongolicum* var. *laeve* G. Jacot, and *T. duplex* G. Jacot are based on the material collected by G. Jacot in 1927–1928 in “Tsinan” (now Jinan) in Shandong and originally deposited at SCU, later to be transferred to JSPC. The material, however, was destroyed, probably during WWII, and is not extant. Obvious lectotypes for the names are achene figures 1a, 1b, and 1c, respectively (G. Jacot, J. N. China Branch Roy. Asiat. Soc. 61: pl. 1. 1930). As this problem requires further study, the names remain uninterpreted in the present treatment.

*T. ohwianum* Kitamura, described from N Korea, was several times reported to occur in China (e.g., FRPS 80(2): 43. 1999). The holotype, depicted in Kitamura (Mem. Coll. Sci. Kyoto Imp. Univ., Ser. B, Biol. 24: pl. III, f. 4. 1957) is no longer extant, and we have to rely on the present treatment.

*T. ohwianum* is characterized by ovate, broadly pale bordered outer phyllaries and by light straw-colored, 4.5–4.9 × 1.1–1.3 mm achenes, with body densely shortly spinulose above, otherwise usually densely tuberculate, and gradually narrowing into a subcylindric (subconic at base and ± cylindric distally) 1–1.3 mm cone. The closest Chinese taxon (*T. alborimarginatum*, incl. *T. mandshuricum*) has achenes substantially less densely spinulose, narrower, and cone much shorter, and cannot be equated with *T. ohwianum*. We failed to find convincing Chinese material belonging to *T. ohwianum*.


1a. Ligules white or very pale whitish yellow ................................................................. 61. *T. coreanum*

1b. Ligules of other colors.

2a. Ligules conspicuously orange-colored ................................................................. 65. *T. aurantiacum*

2b. Ligules yellow.

3a. Achene reddish brown to light red ........................................................................... 63. *T. junpeianum*
Scapes brownish green, equaling to slightly overtopping leaves, scattered arachnoid. Capitulum ca. 3 cm wide. Involucre pale 1.5–3 × 1–2 cm, often pentagonal, apex rounded to subobtuse. broad, margin entire; terminal lobe triangular to helmet-shaped, lanceolate to linear, 6–18 × 1–3 cm, almost glabrous, pinnatifid patent; leaf blade grayish green, narrowly oblanceolate, 6–15 × 2–3.5 cm, almost glabrous, pinnati lobed to pinnatisect; lateral lobes 3–5 pairs, broadly triangular, often with obtuse broad tooth on apical margin; interlobes broad, margin entire; terminal lobe triangle to helmet-shaped, 1.5–3 × 1–2 cm, often pentagonal, apex rounded to subobtuse. Scapes brownish green, equaling to slightly overtopping leaves, scattered arachnoid. Capitulum ca. 3 cm wide. Involucrare pale green, 6–8 mm wide, base ± rounded. Outer phyllaries 13–15, mid-green, ± imbricate, linear-lanceolate to narrowly lanceolate, outermost ones 4.5–6 × 0.8–1.5 mm and 1/3–2/5 as long as inner ones, loosely appressed, distinctly veined, border indistinct, paler green to membranous, and to 0.2 mm wide, margin ± glabrous, apex with a green or purplish thick horn to 1 mm; inner phyllaries 1.1–1.3 cm, apex coriaceous. Ligules yellow; outer ligules outside striped blackish purple; inner ligules with blackish apical teeth. Stigmas pale green to ± yellow. Anthers polliniferous; pollen grains regular in size. Achene of other colors, usually light straw-colored brown to deep brown.

4a. Outer ligules completely tubular ................................................................. 64. \textit{T. siphonanthum}
4b. Outer ligules flat to calcareolate.

5a. Outer phyllaries ovate to broadly lanceolate.
6a. Achene 0.9–1 mm thick, body gradually narrowing into a thin cylindric cone; outer phyllaries ± imbricate ................................................................. 62. \textit{T. albomarginatum}
6b. Achene 1.1–1.3 mm thick, body abruptly narrowing into a thick or medium-thick conic to subcylindric cone; outer phyllaries ± not imbricate.
7a. Outer phyllaries 12–15; leaf interlobes with a distinct brownish purple spot, filiform dentate to lobulate ................................................................. 66. \textit{T. variegatum}
7b. Outer phyllaries 8–12; leaf interlobes green, unspotted, subentire or remotely dentate, not lobulate ................................................................. 67. \textit{T. lamprolepis}

5b. Outer phyllaries linear-lanceolate to narrowly lanceolate.
8a. Achene light (yellowish) straw-colored brown; achene body ± abruptly narrowing into cone ................................................................. 66. \textit{T. variegatum}
8b. Achene mid-brown, deep brown, or grayish brown; achene body gradually narrowing into cone.

9a. Pollen grains regular in size (plants sexual); pappus 4–5 mm ........................................... 57. \textit{T. formosanum}
9b. Pollen grains irregular in size; pappus 5–10 mm.
10a. Outer phyllaries 9–15; stigmas pale green ........................................... 58. \textit{T. mongolicum}
10b. Outer phyllaries 15–20; stigmas dark.

11a. Achene deep purplish brown; achene body 1.3–1.4 mm thick, cone 0.9–1.2 mm ...................................................... 59. \textit{T. liaotungense}
11b. Achene grayish brown; achene body 1.1–1.3 mm thick, cone 1.1–1.5 mm ...................................................... 60. \textit{T. erythropodium}


\textbf{蒙古蒲公英 meng gu pu gong ying}

Herbs 8–25 cm. Petiole usually narrow; leaf blade mid-green, oblanceolate, 6–15 × 2–3.5 cm, subglabrous to sparsely arachnoid, pinnatifid, pinnatisect, or rarely undivided; lateral lobes 3 or 4 pairs, broadly triangular, obtusely deltoid, or broadly linear, patent to recurved, distal margin sparsely dentate or entire, apex obtuse; interlobes broad, sometimes spotted dark purple, margin entire to sparsely dentate; terminal lobe broadly triangular, apex broadly obtuse. Scapes single or rarely branched with an ascending side scape, brownish green, equaling to slightly overtopping leaves, scattered arachnoid but densely arachnoid below capitulum. Capitulum 3–4 cm wide. Involucre mid-green, 1–1.2 cm wide, base ± rounded. Outer phyllaries 9–15, mid-green to pale green, ± not imbricate, linear-lanceolate to narrowly lanceolate, outermost ones 6–9 × 0.8–2.5 mm and ca. 1/2 as long as inner ones, loosely appressed, distinctly veined, border indistinct, paler green to membranous, often suffused pink, and 0.1–0.3 mm wide, margin ± densely ciliate, apex with a green or purplish thick horn to 1.5 mm; inner phyllaries 1.1–1.5 cm, apex flat to coriaceous. Ligules yellow; outer ligules outside striped blackish purple; inner ligules with blackish apical teeth. Stigmas pale green to ± yellow. Anthers polliniferous; pollen grains regular in size. Achene brown, ca. 4 × 1–1.2 mm; body tuberculate throughout, apically tuberculate-squamulose, gradually narrowing into a subcylindric 0.8–1 mm cone; beak 7–10 mm. Pappus white, 4–5 mm. Fl. Mar–Apr. Sexual. \(2n = 24^*\).

- Abandoned fields, grasslands, along paths and roads; 800–2000 m. Anhui, Fujian, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Xizang, Zhejiang.

58. \textit{Taraxacum mongolicum} Handel-Mazzetti, Monogr. Taraxacum, 67. 1907.
The stated distribution of *Taraxacum mongolicum* is based on the report in FRPS (80(2): 34, 1999), but material has not been revised and can only be confirmed for Hebei, Shanxi, Sichuan, and Xizang. However, the reported occurrences in Gansu, Qinghai, Taiwan, and Yunnan are improbable, and material under that name in herbaria from these provinces belongs to other taxa.

For *Taraxacum mongolicum* var. *caninum* and *T. mongolicum* var. *lutea* see the discussion of *T. sect. Mongolica*, above.


*Taraxacum liaotungense* f. *lobulatum* Kitagawa.

Herbs 10–15 cm tall. Petiole ± green, arachnoid at base, winged in most leaves but unwinged in inner ones; leaf blade slightly grayish mid-green with a light green midvein, linear-oblong-triangular, 7–10 × 1–1.5 cm, sparsely arachnoid, pinnatifid to pinnatisect; lateral lobes (4 or)5 or 6 (or 7) pairs, ± triangular to oblong-triangular, 4–8 mm, sometimes from broad base abruptly narrowed into a lingulate distal part, recurved or sub-patent, proximal margin entire, distal margin straight to ± concave and entire or with a single tooth; interlobes sometimes faintly spotted light brownish pink, 3–8 × 2–3 mm, margin entire or with a few unequal teeth or lobules; terminal lobe narrowly triangular to narrowly helmet-shaped or 3-partite, distinctly developed, 1–2.3 × 0.8–1.5 cm, distal margin often dentate or incised, apex subacute to acute. Scapes brownish green, subequalling leaves, arachnoid. *Involucre* ca. 2.5 cm wide. *Involucrèle* 7–8 mm wide, base ± rounded. Outer phyllaries 15–19, mid-green to light green with a gradual transition into a whitish green border, ± not imbricate, linear-lanceolate to lanceolate, outermost ones 6–7 × 1.5–2.5 mm and ca. 1/2 as long as inner ones, ± loosely appressed, margin sparsely ciliate, apex with a brownish purple horn to 1.5 mm; inner phyllaries 1.3–1.4 cm, apex flat or coriaceous. Ligules yellow; outer ligules flat, outside striped blackish. Stigmas dark. Anthers polliniferous; pollen grains irregular in size. Achene grayish brown, 4.9–5.4 × 1.1–1.3 mm; body densely tuberculate throughout, apically densely tuberculate-squamulose, coarsely spinulose on ridges, very gradually narrowing into a narrowly conic 1.1–1.5 mm cone; beak 5–9 mm. Pappus brownish white, ca. 7 mm. Fl. spring. Agamosperm.

- Roadsides, grasslands; 100–400 m. Jilin, Liaoning.

*Taraxacum erythropodium* is very close to *T. liaotungense*. Most of the differences are found in achenes (color, thickness, length of cone) and also leaf coloration.


*Taraxacum pseudoalbidum* Kitagawa; *T. pseudoalbidum* var. *lutescens* Kitagawa.

Herbs 20–25 cm tall. Petiole suffused purplish or ± green, whitish brown arachnoid above, ± winged; leaf blade mid-green and often ± suffused purplish, ± linear-oblongate, 13–20 × (2–)2.5–3(–5) cm, sparsely arachnoid, deeply pinnatisect, lateral lobes (3 or)4–6, usually linear-deltoid to linear-triangular, patent, margin subentire to minutely dentate in outer leaves but dentate and often lobulate in middle and inner ones; lobules also patent, margin sometimes dentate, apex acute to lingulate; interlobes winged, margin dentate-lobulate or rarely entire; terminal lobe flat rhombic to flat triangular, basal segments ± triangular, acute. Scapes brownish green to purplish, ± equaling leaves, arachnoid below and densely arachnoid-lanate below capitulum. *Capitulum* 2.5–3.5 cm wide. *Involucre* light green, 0.9–1.1 cm wide, base narrowly rounded. Outer phyllaries 10–12, light green to green, ± not imbricate, ± lanceolate, narrowly ovate, or sometimes to ovate, outermost ones 7–9 × 2.2–3.6 mm and 1/2–3/5 as long as inner ones, loosely appressed, distinctly veined, border not very distinct, ± membranous, to 0.5 mm wide, and sometimes suffused pink near apex, margin ciliate to sparsely so in apical part, with a dark ca. 1 mm horn near apex; inner phyllaries 1.3–1.6 cm, apex callose to coriaceous. Ligules white or very pale whitish yellow; outer ligules outside ± pinkish and on both surfaces striped purplish gray; inner ligules with blackish apical teeth. Stigmas deep grayish green. Anthers polliniferous; pollen grains irregular in size. Achene ± straw-
colored brown to light brown, 5.6–6 × 1.4–1.6 mm; body tuberculate or minutely squamulose below, densely squamulose and spinulose in upper 1/5–1/3, subgradually narrowing into a subcylindric 1–1.4 mm cone; beak 8–9 mm. Pappus yellowish, ca. 7 mm. Fl. late spring and summer. Agamosperm. 2 

Grasslands, roadsides; below 100–500 m. Liaoning [N Korea].

**Taraxacum coreanum** is also reported from Hebei, Heilongjiang, and Jilin (FRPS 80(2): 35. 1999; Higher Pl. China 11: 775. 2005), but a revision of the material is needed.


*白边蒲公英*  bai bian pu gong ying

**Taraxacum mandshuricum** Nakai ex Koidzumi.

*Herbs 15–23 cm tall. Petiole pinkish to green with a green to pinkish midvein, arachnoid, winged in outer leaves but narrow in innermost ones; leaf blade deep green, broadly oblongolate, 10–15 × 3–5 cm, ± arachnoid, pinnatifid to pinnatisect; lateral lobes usually 3–5, short and broad in outer leaves, triangular to deltoid in middle ones, and linear-triangular in inner ones, ± patent to subrecurved, margin on proximal and distal sides usually dentate; interlobes broad and dentate-lobulate but narrow in inner leaves; terminal lobe broadly flat-triangular or reduced to 3 teeth at apex of almost undivided leaves, margin often minutely dentate, acute and on inner leaves dentate. Scapes brownish green, flocose-arachnoid but densely so below capitulum. Capitulum 3–4 cm wide. Involute 1.1–1.2 cm wide, base rounded to slightly truncate. Outer phyllaries 11–16, slightly imbricate, ovate, outermost ones 5.5–8(–9) × 3–5 mm and 2/5–1/2 as long as inner ones, appressed, surface with visible but not conspicuous venation, middle part dark green and ca. 1 mm wide, with a ± evident whitish pale green wide border, margin villous-ciliate, flat or minutely corniculate near apex; inner phyllaries 1.4–1.7 cm, callose to flat near apex. Ligules yellow; outer ligules ± flat, outside broadly striped grayish green; inner ligules with grayish apical teeth; floret tube pubescent. Stigmas grayish green. Anthers polliniferous; pollen irregular in size. Achene pale grayish straw-colored brown, 3.9–4.1(–4.3) × 0.9–1 mm; body ± subsparsely spinulose above, gradually narrowing into a thin cylindric 0.6–0.7 mm cone; beak 0.9–1.1 cm. Pappus yellowish white, 5–6 mm. Fl. spring. Agamosperm.*

*Grasslands; ca. 300 m. Jilin.*

The sectional position of **Taraxacum junpeianum** is rather uncertain. The characters of outer phyllaries point to T. sect. Mongolica, but achene traits are outside the generally accepted limits of the section. In any case, the character combination is unique, and the name cannot be equated with any related taxon of T. sect. Mongolica as was done in FRPS (80(2): 44. 1999).


*管花蒲公英* guan hua pu gong ying

*Herbs 10–20 cm tall. Petiole green or suffused pinkish, narrowly winged; leaf blade deep green to slightly grayish dark green, ± oblongolate, 8–13 × 2.5–3.5 cm, subglabrous to sparsely arachnoid, pinnatifid to pinnatisect; lateral lobes 4–6, triangular to narrowly triangular, patent, margin entire or with a few minute teeth near base of distal side; interlobes short, ca. 5 mm wide, margin entire; terminal lobe triangular to 3-partite, short, margin entire, apex acute. Scapes brownish green, overtopping leaves, arachnoid below capitulum but later often glabrescent. Capitulum 2–3 cm wide. Involute 0.9–1.1 cm wide, base subconic to ± narrowly rounded. Outer phyllaries 9–12, green with midvein or middle part blackish green, not imbricate, ovate to narrowly ovate, outermost ones 5–7.5 × 2.2–3 mm and 2/5–1/2 as long as inner ones, ± appressed, surface with a distinct venation, border paler, membranous-whitish green, and usually 0.4–0.6 mm wide, margin glabrous or sparsely ciliate, near apex coriaceous or with a horn; inner phyllaries 1.4–1.7 cm, apex coriaceous or with a horn. Ligules deep yellow; outer ligules completely tubular, not striped; inner ligules completely tubular, with darker apical teeth; ligule tube pubescent. Stigmas paler brownish yellow, not exserted. Anthers polliniferous; pollen grains irregular in size. Achene light grayish to pale brownish, 5.2–5.7 × ca. 1 mm; body ± smooth below, subdensely spinulose above, subgradually narrowing into a thin cylindric ca. 1 mm cone, spinules long, ± erect-patent, and acute; beak 8–10 mm. Pappus white, 7–8 mm. Fl. late spring. Agamosperm.*

*Open woodlands with Populus davidiana, Betula mongolica, and Spiraea spp.; 800–1200 m. N Korea.*
In regards to structural differences, *Taraxacum siphonanthum* does not deviate from the pattern observed in other sections of the genus, and its recognition as a separate genus is not justified.


*橘黄蒲公英* ju huang pu gong ying

Herbs 8–20 cm tall. Petiole purple on midvein or green, winged to narrowly winged in outer and middle leaves and unwinged in inner ones, base densely arachnoid; leaf blade glaucous-green and with a purplish or green midvein, narrowly elliptic to narrowly oblanceolate, 6–12 × 1.5–2.5 cm, arachnoid, ± pinnatisect or rarely outer leaves undivided; lateral lobes 3 or 4 pairs, triangular to narrowly triangular, recurved to subrecurved but distal part sometimes patent, apex acute, proximal margin entire or with a few teeth, distal margin usually sigmoid to ± straight and most often entire but sometimes with 1 or 2 acute teeth; interlobes spotted dark brownish purple, 3–5 × 3–4 mm, margin irregularly dentate; terminal lobe narrowly triangular to liguulate-elongated, distal margin concave or sigmoid and usually entire, apex acute. Scapes purplish green, equaling to overtopping leaves, densely arachnoid to almost tomentose. Capitulum 3–4(–5) cm wide. Involucrle light olivaceous green, ca. 1 cm wide, base ± rounded. Outer phyllaries 13–17, light olivaceous green, ± not imbricate, narrowly lanceolate to linear-lanceolate, outermost ones 6–7 × (1.5–)2–3 mm and ca. 2/3 as long as inner ones, erect but distal part often erect-arcuate, distinctly veined, border not distinct, suffused brownish purple or membranous, and 0.1–0.3 mm wide, margin ± long ciliate, apex with purplish brown horn; inner phyllaries 1.1–1.3 cm, apex dark corniculate. Ligules orange; outer ligules flat, outside striped faintly brownish purple; inner ligules with dark brownish purple apical teeth. Stigmas dark (brownish) purplish. Anthers without pollen. Achene light (yellowish) straw-colored brown, (4–)4.1–4.4(–4.6) × 1.1–1.3 cm; body densely spinulose-squamulose throughout or only in upper ca. 1/2 and then other parts ± rugose, ± abruptly narrowing into a subconic (0.7–)0.8–0.9(–1) × 0.3–0.4 mm cone, spines or squamales short; beak 8–9.5 mm, thin. Pappus yellowish white, 5–6 mm. Fl. spring. Agamosperm.

- Grasslands, roadsides; below 100–400 m. Jilin, Liaoning.

*Taraxacum variegatum* as treated in *FRPS* (80(2): 36. 1999, incl. *T. erythropodium*, here treated separately) is also reported from Beijing, Hebei, Heilongjiang, and Nei Mongol, but the material has not been revised.


*光苞蒲公英* guang bao pu gong ying

Herbs 7–18 cm tall. Petiole purplish, narrowly winged or (in inner leaves) unwinged; leaf blade mid-green, narrowly oblanceolate, 7–15(–18) × 0.8–3.5 cm, sparsely arachnoid, pinnatisect; lateral lobes 4–6(or 7) pairs, narrowly triangular, linear-triangulor, or seldom ± linear, usually 9–17 × 2.5–7 mm, recurved, proximal margin straight and usually entire, distal margin ± straight and entire or with 1–3 teeth; interlobes narrow, margin most often remotely dentate; terminal lobe narrowly triangular-sagittate or ± triangular, usually elongated, with 1 or 2 irregular lobules or incisions, apex acute. Scapes purplish green, equaling or ± overtopping leaves, sparsely arachnoid. Capitulum 3–4 cm wide. Involucrle 8–10 mm wide, base ± narrowly rounded. Outer phyllaries 8–12, dark or deep green but sometimes light green or blackish green, ± not imbricate, broadly lanceolate to ovate, outermost ones (6–)7–9(–10) × 2.5–4 mm and 1/2–3/5 as long as inner ones, ± loosely appressed but later often erect-patent, venation often prominent and midvein dark, border paler, light green to whitish green but often suffused purplish, 0.3–1 mm wide, membranous, and with a gradual transition to darker middle part, margin sparsely ciliate near apex, apex ± flat in early capitula but with a thick horn in later ones; inner phyllaries 1.4–1.7 cm, apex ± flat. Ligules yellow; outer ligules flat, outside striped dark gray. Stigmas deep dirty yellow to grayish yellow. Anthers polliniferous; pollen grains irregular in size. Achene light (yellowish) straw-colored brown, 0.7–1 × 0.3–0.5 mm cone, spinules or squamales short; beak 8–9.5 mm, thin. Pappus yellowish white, 5–6 mm. Fl. spring. Agamosperm.

- Grasslands, roadsides; below 100–400 m. S Gansu, W Sichuan.

*Taraxacum aurantiacum* probably also occurs in SE Xizang as the localities in Sichuan are very close to the Xizang border. This taxon was entirely overlooked as a member of the Chinese flora since its description. The report of *T. aurantiacum* from Afghanistan (Soest in K. H. Rechinger, Fl. Iranica 122: 244. 1977) is erroneous because the voucher specimens and the published description belong to another taxon.
in size. Achene ± light straw-colored brown, 3.7–4.2 × 1.2–1.3 mm; body densely spinulose in upper ca. 1/3, abruptly narrowing into a conic to subcylindric 0.5–0.8 mm cone, spinules short, thin, erect-patent to sometimes patent, and acute; beak 8–9 mm, thin. Pappus yellowish white, 6–8 mm. Fl. spring. Agamosperm.

- Hill slopes, fields; 100–300 m. Jilin.

Taraxacum lamprolepis was described from Jilin. FRPS (80(2): 19. 1999) reported it from Heilongjiang, Liaoning, and E Nei Mongol, but re-examination of the material is needed.

In the original description Taraxacum lamprolepis is compared with T. sinicum, but in FRPS (80(2). 19. 1999) T. lamprolepis is included in T. sect. Sinensis, corresponding in this conception to our T. sect. Stenoloba. Neither the achene features nor outer phyllaries point to T. sect. Stenoloba. The large thick horns developing on outer phyllaries of a few young flowering capitula, reticulate venation of outer phyllaries, relatively thick achenes, and outer phyllary shape all place this taxon in T. sect. Mongolica.


塔状蒲公英组 ta zhuang pu gong ying zu

Type: Taraxacum turritum Kirschner & Štěpánek.

Plantaes agamospermae subserotinae, plerumque altae, turritae, foliis erectis, rectis, subcoriaceis, pinnatisectis, lobis laterali-bus et lobo terminali acuminatis, petiolis anguste alatis, capitulis magnis, phyllariis involucralibus exterioribus numerosis (15 ad 25), angustis, linear-lanceolatis usque lanceolatis, suberectis usque arcuato-patentibus, olivaceo-viridibus, anguste indistincte marginatis, obscure callosis vel corollatis, ligulis luteis, tubo florculosam pubescente, achenis pallide stramineo-brunneis vel pal-lido olivaceo-brunneis, longissimis, (4–)5–6.1 mm longis, 1–1.3 mm latis, corpore superne subsparsae usque dense spinulosae, sensim vel subabruptae in pyramidem angustam subcylindricam (1–)1.2–2.2 mm longam transiente, rostro 0.8–1.2 cm, pappus albito-lutescentis 7–8 mm longo.

Plants usually tall. Leaves erect, straight, subleathery; petiole usually narrowly winged; leaf blade narrow, pinnatisect; lateral and terminal lobes usually acuminate at apex. Capitulum large. Outer phyllaries 15–25, linear-lanceolate to lanceolate, narrow, from suberect to arcuate-patent (of almost evenly “echinate” appearance), olivaceous green, indistinctly narrowly bordered, apex dark callose to less often corniculate. Ligules yellow; floret tube pubescent. Achenes light grayish straw-colored brown to light olivaceous brown, (4–)5–6.1 × 1–1.3 mm; body subsparsely to densely spinulose and/or squamulose in upper ca. 1/3, gradually to subabruptly narrowing into a ± thin subcylindric (1–)1.2–2.2 mm cone; beak 0.8–1.2 cm, thin. Pappus yellowish white to light brownish white, 7–8 mm. Agamosperms.

About six species: C Asia to China; three species (all endemic) in China.

1a. pollen absent .................................................. 68. T. turritum

1b. pollen present.

2a. Achene 5.3–5.6 mm, cone 1.3–1.6 mm .................................................................................................................... 69. T. celsum

2b. Achene 4.2–4.4 mm, cone ca. 1 mm ................................................................. 70. T. orientale

68. Taraxacum turritum Kirschner & Štěpánek, sp. nov.

塔状蒲公英 ta zhuang pu gong ying


Plantaes agamospermae, robustae, foliis ± subcoriaceis, plerumque pinnatisectis, lobis laterali-bus numerosis, linear-triangulatibus vel linearibus, lobo terminali acuminato, phyllariis involucralibus exterioribus 18 ad 20, angustis, linear-lanceolatis, erecto-arcuratis usque arcuato-patentibus, ecorollatis, stigmaulis luteo-viridibus, antheris polline carentibus, achenis griseo-striatis, eximie longis, supernae squamulosae, in pyramidem angustam subcylindricam 1–2.2 mm longam ± sensim aebunites.

Herbs 15–22 cm tall, usually robust. Petiole pinkish, broadly to narrowly winged; leaf blade light mid-green, ± ob lanceolate to linear-oblongolate, 11–22 × 2–3.5 cm, ± subleath ery, sparsely to ± densely arachnoid, usually pinnatisect; midvein usually pinkish near base otherwise pale green; lateral lobes 6 or 7(–9), to 1.8 cm, from ca. 0.8 cm wide at base narrowing into linear or linear-triangular acute distal part, usually ± patent, proximal margin ± straight and entire, distal margin concave and usually with a distinct basal lobule and/or a few teeth; interlobes 3–5 mm wide, margin sparsely dentate; terminal lobe ± narrowly triangular, 1.5–2.5 × ca. 1.5 cm, basal segments patent to subrecurred or ± curved upward, terminal with distal margin concave or straight and usually entire and apex acuminate. Scapes light green but light pinkish at base, ± equaling
leaves, ± densely arachnoid. Capitulum 3.5–4.5 cm wide. Involucre 8–10 mm wide, base broadly obconic. Outer phyllaries 18–20, dark brownish green, broadly lanceolate to linear-lanceolate, outermost ones 7–9 × 2–3 mm and 2.3–4.5 as long as inner ones, variously erect-arcuate to arcuate-patent but ± patent after anthesis, border paler membranous and 0.1–0.2 mm wide, margin sparsely ciliate and often remotely serrulate, apex dark callose; inner phyllaries 1.2–1.3 cm, apex ± flat. Ligules deep yellow; outer ligules ± flat, outside striped indistinctly grayish green; inner ligules with yellow apical teeth. Stigmas grayish yellowish green. Anthers without pollen. Achene grayish straw-colored brown, (4–)5.3–6.1 × 1–1.2 mm; body ± densely squamulose and spinulose in upper ca. 1/3, ± gradually narrow into a thin subcylindric (1–)1.5–2.2 mm cone, spinules curved upward; beak 1–1.3 cm. Pappus brownish white, ca. 7 mm. Fl. late spring. Agamosperm.

- Grazed alpine meadows, margins of Abies forests; 3200–4300 m. NW Yunnan.

69. **Taraxacum celsum** Kirschner & Štěpánek, sp. nov.


*Plantae agamospermae altae, foliis erectis subcoriaceis pinnatisectis, lobis lateralibus plumereos sursum curvatis, parte distali lingulatis, acutis, lobo terminali vulgo mucronulato, scapis dense araneosis, calathis usque ad 5 cm latis, saturate luteis, phyllariis involucralibus exterioribus 20 ad 25, lanceolatis vel anguste lanceolatis, phyllariis inferioribus fere aequilongis, apice arcuatis usque arcuato-recurvatis, callosis usque corneis, stigmatibus luteo-viridibus, antheris polliniferis, achenis griseo-stramineis, eximie longis, cor- pore supernae dense spinuloso, in pyramiden subcylindricam ca. 1.3–1.6 mm longam subabrupte aequilongis*

Herbs 25–35 cm tall, robust. Petiole purple, broadly winged in outer leaves but almost unwinged in inner ones; leaf blade light bright green and usually with a pale grayish pink midvein, ± narrowly oblanceolate to linear-lanceolate, 15–25 × 3.5–4.5 cm, subleathery, sparsely to ± densely arachnoid, pinnatisect; lateral lobes 4 or 5(or 6), ca. 2 cm, from ca. 1 cm wide abrly narrowing into a lingulate acute distal part, usually conspicuously pointing upward but less often ± patent, proximal margin ± straight, distal margin sigmoid, dentate, and incised; interlobes to 2 cm, margin sparsely dentate, teeth long and narrow; terminal lobe ± broadly triangular to deltoid, 1.5–2(–3.5) × 2–3.5 cm, basal segments patent to curved upward, terminal segment with distal margin concave and entire and apex acute and submucronate. Scapes light green but purplish at base, overtopping leaves, densely arachnoid. Capitulum ca. 3 cm wide. Involucre 8–10 mm wide, base broadly obconic to flat. Outer phyllaries 15–19, dark olivaceous green but later adaxially often brownish purple, lanceolate to narrowly lanceolate, outermost ones 6–9 × 2–3 mm and 2.5–1/2 as long as inner ones, of various posture from subrect-acute to arcuate-recurved, paler border indistinct, margin glabrous, apex often callose; inner phyllaries 1.2–1.3 cm. Ligules deep yellow; outer ligules ± flat, outside striped light grayish pink; inner ligules with reddish or yellow apical teeth. Stigmas greenish dirty yellow. Anthers polliniferous, striped brownish red on edges; pollen grains irregular in size. Achene grayish straw-colored brown, 5.3–5.6 × 1–1.3 mm; body ± densely spinulose in upper ca. 1/3, subabruptly narrowing into a subcylindric 1.3–1.6 mm cone, spinules long, thin, and ± suberect; beak ca. 1 cm. Pappus dirty white, 7–8 mm. Fl. late spring. Agamosperm.

- Mountain meadows; ca. 3500 m. W Sichuan.

70. **Taraxacum orientale** Kirschner & Štěpánek, sp. nov.

东方蒲公英  dong fang pu gong ying


*Plantae agamospermae, mediocres, foliis pinnatilobis usque pinnatisectis, lobis lateralis triangularibus, lobo terminali anguste triangulatis, petiolis anguste alatis, phyllariis involucralibus exterioribus 15 ad 19, lanceolatis usque anguste lanceolatis, subrecto-arcuatis usque arcuato-recurvatis, im-marginatis, ecorcadulatis, stigmatibus luteo-viridibus, antheris polliniferis, achenis griseo-stramineis, ecorniculatis, eximie longis, cor-pore supernae dense spinuloso, in pyramiden ± cylindricam ca. 1.5 mm longam ± abrupte transiente.*

Herbs 15–25 cm tall, medium-sized. Petiole dark purple, narrowly winged; leaf blade light green, linear-oblong to ± narrowly oblanceolate, 8–20 × 2–4 cm, ± subleathery, sparsely arachnoid, pinnatisect on outer leaves to pinnatisect in middle ones, midvein usually brownish purple but distally often light green; lateral lobes (3–)5–7, triangular and distally ± abruptly narrowing into a narrow acute apex, small, subrecurved or less often ± patent, proximal margin straight and entire, distal margin sigmoid and usually entire but sometimes dentate; inter-lobes short and broad, margin usually entire; terminal lobe ± narrowly triangular, (1–)1.5–2(–3.5) × 1–1.5 cm, basal seg-ments patent to subrecurved and apex acuminate, terminal seg-ment with distal margin sigmoid and entire or with a few asym-metric teeth and apex acute to acuminate. Scapes light green but later brownish, often pinkish at base, overtopping leaves, arach-roid but glabrescent. Capitulum ca. 3 cm wide. Involucre 8–10 mm wide, base broadly obconic to flat. Outer phyllaries 15–19, dark olivaceous green but later adaxially often brownish purple, lanceolate to narrowly lanceolate, outermost ones 6–9 × 2–3 mm and 2.5–1/2 as long as inner ones, of various posture from subrect-acute to arcuate-recurved, paler border indistinct, margin glabrous, apex often callose; inner phyllaries 1.2–1.3 cm. Ligules deep yellow; outer ligules ± flat, outside striped purplish grayish brown; inner ligules with reddish or yellow apical teeth. Stigmas yellowish green. Anthers polliniferous; pollen grains irregular in size. Achene grayish straw-colored brown, 4.2–4.4 × 1–1.4 mm, body densely spinulose in upper ca. 1/3, ± abruptly narrowing into a thin ± cylindric ca. 1 mm cone, spinules ± long; beak 8–9 mm. Pappus ± white, ca. 7 mm. Fl. late spring. Agamosperm.

- Mountain meadows; 3100–3300 m. W Sichuan.

Plants medium-sized. Leaves light green to deep green, arachnoid, not thickened; petiole usually purplish or pinkish, usually broadly to narrowly winged but in inner leaves sometimes unwinged; leaf blade usually pinnatisect; lateral lobes usually triangular, subrecurved. Outer phyllaries usually 13–19, ovate, broadly ovate, or sometimes ovate-lanceolate, usually appressed, loosely appressed erect, or ± erect-patent, venation distinct or not clearly visible, border narrow to broad, apex usually flat or sometimes corniculate. Ligules yellow; ligule tube pubescent with straight hairs. Achene grayish straw-colored brown, 3.6–5 × 0.9–1.2 mm; body often with prominent lateral ridges (narrowly winged), densely shortly spinulose above, abruptly to almost gradually narrowing into a conic to subcyllindric 0.4–0.8(–1.1) mm cone; beak usually 6–10 mm, thin. Pappus white or yellowish white.

About 35 species: centered in C Asia; 20 species (19 endemic) in China.

The sectional type, Taraxacum qaiseri Abedin from Pakistan, is based on a single, imperfectly prepared and preserved specimen, and it is difficult to interpret the section on this basis. The members of T. sect. Qaisera, as understood here, are superficially similar to those of T. sect. Taraxacum but have outer phyllaries very broad, usually ovate or broadly ovate, appressed to erect-patent, and sometimes even imbricate; petioles usually broadly winged; and ligule tube with straight hairs. Taraxacum sect. Qaisera is comprised of mostly agamospermous hybridogenous species of unknown parentage. We can hypothesize on the basis of morphological similarity that one of the parental taxa may belong to T. sect. Calanthisius.


Taraxacum pseudoalpinum Schischkin (Fl. Kazakhst. 9: 437, 571. 1966) and T. pseudoroseum Schischkin (Fl. URSS 29: 528, 744. 1964), described from C Tian Shan, belong to T. sect. Qaisera. They were reported as members of the Chinese flora (FRPS 80(2): 71–72. 1999), but we failed to find any specimens of these two taxa from China.

1a. Pollen absent.
2a. Stigmas yellow ........................................................................................................................................................... 75. T. flororum
2b. Stigmas discolored ................................................................................................................................................... 83. T. aeneum

1b. Pollen present.
3a. Pollen grains regular in size ............................................................................................................................................ 86. T. xinyuanicum
3b. Pollen grains irregular in size.

4a. Outer phyllaries with thick horns ......................................... 90. T. brevicorniculatum (see also key to T. sect. Ceratoidea)
4b. Outer phyllaries flat to ± minutely corniculate.

5a. Outer phyllaries patent, arcuate-patent, erect-patent or subrecurved, not appressed to erect.
6a. Outer phyllaries imbricate; leaves ± glabrous ................................................................. 79. T. tonsum
6b. Outer phyllaries not imbricate; leaves sparsely arachnoid.

7a. Outer phyllaries with a broad paler border to 2 mm wide .............................................. 71. T. horizontale
7b. Outer phyllaries with a narrow pale border 0.1–0.2 mm wide.

8a. Achene cone subcylindric, 0.8–0.9 mm .............................................................. 72. T. perplexans
8b. Achene cone ± conic, 0.5–0.7 mm ........................................................................ 80. T. dammahile

5b. Outer phyllaries appressed, loosely appressed, or erect.

9a. Outer phyllaries not imbricate.
10a. Achene body abruptly narrowing into a ca. 0.4 mm cone ............................................ 77. T. icterinum
10b. Achene body gradually narrowing into a 0.8–1.1 mm cone.

11a. Outer phyllaries 8–9 mm ...................................................................................... 84. T. simulans
11b. Outer phyllaries 4–7 mm.

12a. Stigmas yellow ............................................................................................................. 81. T. adglabrum
12b. Stigmas light discolored ............................................................................................. 88. T. puberulum

9b. Outer phyllaries imbricate.
13a. Stigmas yellow ............................................................................................................ 79. T. tonsum
13b. Stigmas discolored.

14a. Involute base obconic ................................................................................................. 78. T. cyathiforme
14b. Involute base rounded to truncate.

15a. Outer phyllaries 6–8 mm wide .............................................................................. 82. T. subcontristans
15b. Outer phyllaries 3–5 mm wide.

16a. Paler border to outer phyllaries 0.5–1 mm wide.
17a. Achene body subabruptly narrowing into a conic 0.7–0.9 mm 

cone; beak ca. 6 mm; stigmas blackish green ........................................... 87. T. potaninii

17b. Achene body ± gradually narrowing into a subcylindric

0.8–1 mm cone; beak ca. 9 mm; stigmas yellowish green ..... 89. T. protractifolium

16b. Paler border to outer phyllaries not developed or 0.1–0.2 mm wide.
71. Taraxacum horizontale Kirschner & Štěpánek, sp. nov.

平枝蒲公英  牟志普雄英

Type: China. Xinjiang: “Tian Shan [天山], pars montium Borohoro Shan [婆罗科努山], situ occid. a lacu Sayram Hu [赛里木湖],” 2109 m, 29 Sep 2004, P. Sekerka, P. Hanzelka & I. Bulánková 04/27, cultivated as JS 7957 (holotype, PRA; isotypes, MO, PE, PRA).

Herbs 15–22 cm tall. Petiole light green to faintly pinkish, very broadly winged; leaf blade yellowish green and usually with a faintly brownish purple midvein, ob lanceolate, 11–20 × 4–5.5 cm, sparsely arachnoid, regularly pinnatisect; leaf lobes 4 or 5 pairs, ± narrowly triangular, to 2.5 × 1.5 cm, patent to subcurved, distal margin slightly convex or ± sigmoid and usually entire, apex acute; interlobes evident, with purplish brown spots, margin dentate; terminal lobe triangular to broadly triangular, 1.5–2.5 × ca. 1.5 cm, margin entire, apex subacute. Scapes light brownish green, subequaling leaves, usually densely arachnoid. Capitulum ca. 4.5 cm wide. Involucre 1–1.2 cm wide, base ± rounded. Outer phyllaries 15–20, abaxially light green suffused pinkish and with a slightly darker middle part, adaxially slightly glaucous-green, ± not imbricate, lanceolate to ovato-lanceolate, outermost ones 10–12 × (3–)4–5 mm and ca. 3/4 as long as inner ones, ± irregularly patent, erect-patent, or arcuate-patent, laterally with gradual transition into a whitish green border to 2 mm wide and a membranous fringe 0.2–0.3 mm wide, margin sparsely ciliate, apex ± flat; inner phyllaries ca. 1.5 cm. Ligules deep yellow; outer ligules ± flat, outside striped purplish gray; inner ligules with grayish purple teeth at apex; ligule tube pubescent. Stigmas grayish greenish yellow. Anthers polliniferous; pollen grains irregular in size. Achene light grayish straw-colored brown, 3.6–3.8 × 1.2–1.4 mm; body subdensely spinulose-squamulose above, subapruptly narrowing into a conic ca. 0.5 mm cone; beak 8–10 mm. Pappus dirty white, 6–7 mm. Fl. late spring. Agamosperm.

- Montane meadows and pastures; 2000–2200 m. W Xinjiang.

72. Taraxacum perplexans Kirschner & Štěpánek, sp. nov.

惊喜蒲公英  既喜普雄英

Type: China. Xinjiang: “montes Altaj [阿尔泰山], situ boreal. a Qinghe [青河],” 1557 m, 23 Sep 2004, P. Sekerka, P. Hanzelka & I. Bulánková 04/06, cultivated as JS 7959 (holotype, PRA; isotypes, MO, PE, PRA).

Paratypes: China. Xinjiang: ibidem, P. Sekerka, P. Hanzelka & I. Bulánková 04/06, cultivated as JS 7958 (PRA); Korla Xian [库尔勒县], May 1999, P. Sekerka, Zhang Dao Yuan & V. Huml s.n., cultivated as JS 7383 (PRA); “Tian Shan [天山], Wang Mu Miao monastery near Tian Chi lake [天池湖],” 1950 m, 2 Oct 2003, P. Sekerka 03/2, cultivated as JK 4947 (PRA).

Herbs 15–22 cm tall. Petiole light purplish green, broadly winged in outer leaves but narrowly so in middle ones; leaf blade deep green, narrowly elliptic to narrowly ob lanceolate, 10–23 × 3–5.5 cm, ± sparsely arachnoid, pinnatisect, midvein adaxially brownish purple throughout; lateral lobes (4–)6 or 7 pairs, ± narrowly triangular, 1–2.5 × 1–1.5 cm, ± patent but sometimes slightly bent upward, distal margin of upper lobes ± entire but denticulate in lower ones, apex acute; ligules evident, bordered purplish brown and with raised denticulate margin; terminal lobe triangular to broadly triangular, 1–3.5 × 1.4–3 cm, margin entire or with 1 or 2 asymmetric incisions, apex subacute. Scapes purplish green, ± equaling leaves, usually
Herbs 14–18 cm tall. Petiole light purplish green, broadly winged in outer leaves, narrowly so in middle ones, arachnoid at base; leaf blade light green, ± narrowly elliptic to elliptic, 8–16 × 2.5–4.5 cm, arachnoid, pinnatisect, midvein darkly brownish purple in proximal part; lateral lobes 4–6 pairs, ± triangular to narrowly deltoid-triangular, to 2 × 1.5 cm, sub recurved to hamate-recurved, distal margin convex and entire or with 1 or 2 teeth, proximal margin straight to concave and entire or with 1 large tooth, apex acute; interlobes short, margin raised and dentate; terminal lobule triangle broadly triangular, 1–2.5 × 1.5–3 cm, margin usually entire, apex subacute. Scapes green but pinkish at base, ± equaling leaves, usually densely arachnoid. Capitulum ca. 3.5 cm wide. Involucre ca. 1 cm wide, base ± truncate. Outer phyllaries 14–17, abaxially dark (blackish) olivaceous green and wholly suffused brownish purple, ± imbricate, broadly lanceolate to ovate-lanceolate, outermost 8–9 × 3.5–4.5 mm and ca. 2/3 as long as inner ones, loosely appressed, with an indistinct dirty membranous 0.1–0.2 mm wide border, margin subglabrous to sparsely ciliate, apex ± flat; inner phyllaries 1.2–1.3 cm. Ligules deep yellow; outer ligules ± flat, outside striped purplish grayish brown; inner ligules with yellow teeth at apex; ligule tube pubescent. Stigmas greenish yellow, abaxially dark pubescent. Anthers polliniferous; pollen grains irregular in size. Achene light grayish olivaceous brown, 3.7–3.9 × 1–1.2 mm, with distinct lateral and ventral ridges; body densely spinulose in upper ca. 1/3, ± abruptly narrowing into a conic 0.5–0.6 × ca. 0.3 mm cone, spinules thin and often slightly recurved; beak ca. 1.1 cm. Pappus dirty white, 6–7 mm. Fl. late spring. Agamosperm.

74. Taraxacum pseudocalanthodium Kirschner & Štěpánek, sp. nov.

Herbs 15–20 cm tall. Petiole light purplish green, broadly winged in outer leaves but narrowly winged in middle ones; leaf blade light grayish green with a faintly brownish purple midvein, broadly oblongate to oblongate-lanceolate, 9–12 × 2–3 cm, sparsely arachnoid, pinnatisect to runcinate-pinnatisect; lateral lobes (3 or)4 or 5 pairs, ± triangular to ± deltoid-triangular, sub recurved, proximal margin straight to slightly concave and entire, distal margin convex and entire or with a few acute teeth, apex acute to sometimes ± obtuse; interlobes usually spotted purplish brown, short, margin often raised and entire; terminal lobe usually helmet-shaped, 2.5–4 × 2.5–3 cm, margin ± entire and often with 1 or 2 incisions, apex subacute. Scapes green but pinkish at base, ± overtopping leaves, usually sparsely arachnoid to glabrescent. Capitulum 3–3.5 cm wide. Involucre ca. 1 cm wide, base ± truncate. Outer phyllaries 14–17, abaxially dark (blackish) olivaceous green and wholly suffused brownish purple, ± imbricate, broadly lanceolate to ovate-lanceolate, outermost 8–9 × 3.5–4.5 mm and ca. 2/3 as long as inner ones, loosely appressed, paler border ± not developed or with membranous ca. 0.1 mm border, margin subglabrous or sparsely ciliate, apex ± flat; inner phyllaries ca. 1.3 cm, apex flat. Ligules deep yellow; outer ligules ± flat, outside striped purplish gray; inner ligules with purplish teeth at apex; ligule tube pubescent. Stigmas light greenish yellow, outside dark pubescent. Anthers polliniferous; pollen grains irregular in size. Achene light grayish olivaceous brown, 4.3–4.5 × ca. 1 mm; body ± densely spinulose-squamulose above, ± abruptly narrowing into a ± thin conic (0.9–)1–1.1 mm cone; beak 9.5–10.5 mm. Pappus white, 6–7 mm. Fl. late spring. Agamosperm.
75. **Taraxacum florum** Kirschner & Štépánek, *sp. nov.*

金发蒲公英  jin fa pu gong ying

Type: China. Xinjiang: “Ad ripam fluminis Ili He [伊犁河], haud procul ab oppido Yining [伊寧],” 600 m, 30 Sep 2004, P. Sekerka, P. Hanželka & I. Bulánková 04/32, cultivated as JŠ 7961 (holotype, PRA; isotypes, MO, PE, PRA).

Paratypes: China. Xinjiang: “Tian Shan [天山], shore of Tian Chi lake [天池湖],” 1914 m, 1 Oct 2003, P. Sekerka 03/1, cultivated as JK 4946 (PRA).

*Plantae agamospermae mediocres, foliis saturate viridis, indistincte brunoep-purpurascensitibus, ob lanceolatis, pinnatisectis, lobis lateralisibus 3 ad 5 utrinque, petolis folio-lateralisibus 3 vel 4 utrinque, petiolaribus exterioribus late alatis, ovatis vel ovato-lanceolatis, laxe adpressis, stigmatibus luto-purpureis, antheris polliniferis, acheniis vulgo 3.4–3.5 mm longis, superne dense squamuloso-spinulosis, in pyramidem subconica 0.4–0.5 mm longae subsemens abuntibus.*

**Herbs** 12–15 cm tall. Petiole brownish purple, narrowly winged in outer leaves but ± unwinged in middle ones; leaf blade deep green with a purplish midvein, narrowly oblongate to oblanceolate, 7–9 × 2–3 cm, sparsely arachnoid, pinnafractis, lateral lobes 3 or 4 pairs, ± triangular, ± recurved to hamate-recurred, proximal margin entire, distal margin convex and entire, apex acute; interlobes short and broad, margin often raised but entire; terminal lobe broadly triangular, margin entire, apex subobtuse. Scapes pale brownish green, overtopping leaves, arachnoid. Capitulum to 4.5 cm wide. Involucre 1.2 cm wide, base ± truncate. Outer phyllaries 17–19, abaxially dark olivaceous green to blackish green and suffused brownish purple in upper ca. 1/3, ± imbricate, ± ovate to ovate-lanceolate, outermost ones 8–9 × (3.5–)4.5–5 mm and 1/2–3/5 as long as inner ones, loosely appressed, venation slightly prominent, with whitish membranous border ca. 0.1(–0.2) mm wide, margin sparsely ciliate, apex flat; inner phyllaries 1.4–1.5 cm, apex flat. Ligules deep yellow; outer ligules ± flat, outside striped greenish pinkish gray; inner ligules with grayish purple teeth at apex; ligule tube pubescent. Stigmas greenish yellow, abaxially dark brownish purple. Anthers polliniferous; pollen grains irregular in size. Achenes light grayish olivaceous brown, 3.4–3.5 × ca. 0.9 mm; body ± densely spinulose-squamulose above, subgradually narrowing into a subconic 0.4–0.5 mm cone; beak ca. 9.5 mm. Pappus ± white, ca. 6 mm. Fl. late spring. Agamosperm.

- Montane meadows and pastures; 1800–2800 m. W Hubei.

77. **Taraxacum icterinum** Kirschner & Štépánek, *sp. nov.*

黄疸蒲公英  huang dan pu gong ying

Type: China. Sichuan: “Sichuan occid., urbis Kangding [康定; in urbis vicinatate boreo-orientalit;],” ca. 2650 m, 30 May 1992, L. Businská & R. Businsky 1, cultivated as JŠ 5106 (holotype, PRA; isotypes, MO, PE, PRA).


*Plantae agamospermae mediocres, foliis saturate viridis, anguste brunoep-purpurascentsitibus, pinnafractis, lobis lateralisibus 4 vel 5 utrinque, petiolaribus exterioribus 13 ad 15, ovato-lanceolatis, laxe adpressis, stigmatibus luteo-viridis, antheris polliniferis, acheniis vulgo 3.4–3.5 mm longis, superne dense squamuloso-spinulosis, in pyramidem subconica 0.4–0.5 mm longae subsemens abuntibus.*

**Herbs** 12–15 cm tall. Petiole purple, broadly winged in outer leaves but ± unwinged in middle ones; leaf blade deep green; leaf blade deep green with a purplish midvein, narrowly oblongate to oblanceolate, 7–9 × 2–3 cm, sparsely arachnoid, pinnafractis, lateral lobes 3 or 4 pairs, ± triangular, ± recurved to hamate-recurred, proximal margin entire, distal margin convex and entire, apex acute; interlobes short and broad, margin often raised but entire; terminal lobe broadly triangular, margin entire, apex subobtuse. Scapes pale brownish green, overtopping leaves, arachnoid. Capitulum to 4.5 cm wide. Involucre 1.2 cm wide, base ± truncate. Outer phyllaries 17–19, abaxially dark olivaceous green to blackish green and suffused brownish purple in upper ca. 1/3, ± imbricate, ± ovate to ovate-lanceolate, outermost ones 8–9 × (3.5–)4.5–5 mm and 1/2–3/5 as long as inner ones, loosely appressed, venation slightly prominent, with whitish membranous border ca. 0.1(–0.2) mm wide, margin sparsely ciliate, apex flat; inner phyllaries 1.4–1.5 cm, apex flat. Ligules deep yellow; outer ligules ± flat, outside striped greenish pinkish gray; inner ligules with grayish purple teeth at apex; ligule tube pubescent. Stigmas greenish yellow, abaxially dark brownish purple. Anthers polliniferous; pollen grains irregular in size. Achenes light grayish olivaceous brown, 3.4–3.5 × ca. 0.9 mm; body ± densely spinulose-squamulose above, subgradually narrowing into a subconic 0.4–0.5 mm cone; beak ca. 9.5 mm. Pappus ± white, ca. 6 mm. Fl. late spring. Agamosperm.

- Montane meadows and pastures; 1800–2800 m. W Hubei.
Herbs 15–20 cm tall. Petiole purple, broadly winged; leaf blade deep green, sometimes suffused brownish purple, and with a purplish midvein, narrowly oblanceolate to narrowly oblong, 7–15 × 1.5–3 cm, sparsely arachnoid, shallowly pinnatilobed to pinnatisect, margin sometimes undivided and entire in distal ca. 1/3; lateral lobes 4 or 5 pairs, ± broadly triangular, recurved, proximal margin entire, distal margin shallowly sigmoid and entire but dentate in lower lobes, apex acute; interlobes short and broad, margin ± entire; terminal lobe narrowly triangular to helmet-shaped, margin acute to mucronate. Scapes brownish green, overtopping leaves, sparsely arachnoid. Capitulum ca. 4 cm wide. Involucre 1–1.2 cm wide, base rounded. Outer phyllaries 13–15, abaxially blackish green, suffused brownish purple in upper part, and slightly pruinose; ± not imbricate, ± ovate-lanceolate, outermost ones 11–13 × 3–6 mm and almost as long as inner ones, loosely appressed, with a whitish 0.1–0.2 mm wide border, margin sparsely ciliate, apex flat. Ligules deep yellow; outer ligules ± flat, outside striped purplish brown gray; inner ligules with ± yellow teeth at apex; ligule tube sparsely pubescent to glabrous. Stigmas bright yellow, abaxially blackish pubescent. Anthers polliniferous; pollen grains irregular in size. Achene grayish brown, axially ovate to broadly ovate but some ovate-lanceolate, 1.4–1.5 cm. Ligules yellow; outer ligules ± flat, outside striped purplish brown; inner ligules with yellow or faintly pink teeth at apex; ligule tube sparsely pubescent to glabrous. Stigmas grayish green, abaxially blackish pubescent. Anthers polliniferous; pollen grains irregular in size. Achene light brown, 4–4.2 × 0.9–1.1 mm; body with prominent lateral conic. Outer phyllaries 12–17, abaxially grayish green and slightly pruinose, ± not imbricate, linear-lanceolate to lanceolate, outermost ones 7–9 × 2–3.3 mm and ca. 2/3 as long as inner ones, loosely appressed to erect, with a whitish 0.1–0.2 mm wide border, margin subglabrous, apex purplish and initially flat but in later capitula horned; inner phyllaries ca. 1.2 cm, apex ± flat. Ligules deep yellow; outer ligules ± flat, outside striped purplish brown; inner ligules with reddish teeth at apex; ligule tube sparsely pubescent to glabrous. Stigmas grayish green, abaxially blackish pubescent. Anthers polliniferous; pollen grains irregular in size. Achene light brown, 3.5–3.9 × ca. 1.1 mm; body densely spinulose-squamuloso above, ± abruptly narrowing into a subconic ca. 0.4 mm cone; beak ca. 5.5 mm. Pappus ± white, ca. 6 mm. Fl. late spring. Agamosperm.

Montane meadows and pastures; 2600–3500 m. W Sichuan.

78. Taraxacum cyathiforme Kirschner & Štěpánková, sp. nov.

杯形蒲公英 bei xing pu gong ying


Plantae agamospermae medioici, folis glaucescenti-viridibus, ob lanceolatis, fere glabris, pinnatisectis, lobis lateralibus 3 vel 4 utrinque, linear-lanceolatis, elongatis, apice angustatis, petiolis latisimis alatis, involucro basi subtrunco, phyllaris involucralibus inferioribus 12 ad 17, obscuro griseo-viridibus, subpuco nosis, lanceolatis vellinear-lanceolatis, laxe adpressis, stigma tibus saturate luteis, antheris polliniferis, achenis plerumque 4–4.2 mm longis, superne subdense spinuloso, in pyramidem subcylindricam 0.5–0.6 mm longam sub abrupte abeuntibus.

Herbs 15–20 cm tall. Petiole pinkish purple, narrow to broadly winged; leaf blade grayish green with a faintly pinkish midvein, oblanceolate, 9–19 × 1.7–2.8 cm, ± glabrous, regularly shallowly to deeply pinnatisect; lateral lobes 3 or 4(or 5) pairs, triangular to broadly so, 5–10 × ca. 10 mm, ± patent to subrecurved, distal margin straight to subconca ve and sparsely minutely dentate or ± entire, apex acute; interlobes unspotted, 5–8 × ca. 5 mm, margin sparsely dentate or entire; terminal lobe triangular to narrowly triangular, 1–4 × 0.8–2.3 cm, rarely 3-partite, margin entire or sparsely dentate, apex subacute. Scapes light green but purplish at base, subequalling leaves, usually sparsely arachnoid. Capitulum 2–2.5 cm wide. Involucre 8–10 mm wide, base flat, rounded. Outer phyllaries 17–20, light olive-green green but suffused purplish apically, imbricate, usually ovate to broadly ovate but some ovate-lanceolate, outermost ones (5,5–)7–8 × (3–)3.5–5 mm and 1/2–3/5 as long as inner ones, loosely appressed to erect-patent, with a distinct whitish 0.2–0.4 mm wide border, margin very sparsely ciliate, apex ± flat but subcuncinate in later capitula; inner phyllaries 1.4–1.5 cm. Ligules yellow; outer ligules ± flat, outside stri ped purplish black; inner ligules with yellow or faintly pink teeth at apex; ligule tube pubescent. Stigmas pure deep yellow. Anthers polliniferous; pollen grains irregular in size. Achene grayish light brown, 4.4 × 0.9–1.1 mm; body with prominent lateral...
ridges, subdensely spinulose, subabruptly narrowing into a subcylindrical 0.5–0.6 mm cone; beak 8–8.5 mm. Pappus dirty white, ca. 6 mm. Fl. late spring. Agamosperm.

- Grasslands, ruderal lawns, pastures; 1200–1400 m. SW Xiningjiang (Kashi).

80. Taraxacum dannabiale Kirschner & Štěpánek, sp. nov.


Plantaee agamospermae medici, foliis obscure viridibus, pinnatisectis, lobis lateralisibus numerosis, (4 vel)5 vel 6 vel 7 utrinque, triangularibus, subrecurrvis, plerumque linear-lanceolatis, interlobis bado-purpurise, petiolis alatis, phyllaribus involucralibus exterioribus ad 22, irregulariter patentibus usque acutu-recurrvis, ovato-lanceolatis vel lanceolatis, glaberrimis, stigmatibus saturate luteis, antheris polliniferos, achenis 3.7–3.9 mm longis, superne dense squamulo-so- spinulosis, in pyramide conicum 0.5–0.7 mm longam subsemis abeuntibus.

Herbs 14–17 cm tall. Petiole green or purplish, very broadly winged in outer leaves but narrowly so in inner ones; leaf blade dark green, usually suffused bronze, and with a brownish pink midvein, broadly linear-oblongate to narrowly oblong, 10–17 × 2–3.5 cm, arachnoid, pinnatisect; lateral lobes (4 or)5 or 6 (or 7) pairs, ± triangular, subrecurved, distal part sometimes linear-lanceolate, proximal margin straight and entire, distal margin shallowly sigmoid to ± straight and usually sparsely denticulate or sometimes entire, apex acute; interlobes with deep purple brown spots, short, 4–7 mm wide, margin irregularly dentate; terminal lobe to broad triangular to helmet-shaped, 1–3 × 1.5–2.5 cm, terminal segment elongated, margin usually entire or with irregular teeth or incisions. Scapes purplish green, subequaling leaves, ± densely arachnoid. Capitulum 3.5–4.5 cm wide. Involucr 1. wide base ± rounded. Outer phyllaries 16–22, abaxially deep olivaceous green and apically brownish pink, ± not imbricate, ovato-lanceolate to lanceolate, outermost ones 9–11 × 3–5 mm and ca. 2/3 as long as inner ones, conspicuously irregularly patent to recurved, border light grayish green but later abaxially also suffused brownish purple, membranous, and 0.1–0.2 mm wide, margin glabrous, apex ± callose; inner phyllaries 1.1–1.2 cm. Ligules deep yellow; outer ligules ± flat, outside striped greenish gray; inner ligules with dirty yellow or yellow teeth at apex. Stigmas grayish yellow, abaxially partly blackish pubescent. Anthers polliniferous; pollen grains irregular in size. Achenes light grayish straw-colored brown, (3.5–)4.3–4.5 × 0.7–0.8 mm; body with ± prominent lateral ridges, ± sparsely spinulose above, very gradually narrowing into a subcylindrical 0.8–1 mm cone; beak ca. 7 mm. Pappus ± white, 6–7 mm. Fl. late spring. Agamosperm.

- Grasslands, ruderal lawns, pastures; 1200–1400 m. SW Xiningjiang, Hubei, Shaanxi.

81. Taraxacum adglabrum Kirschner & Štěpánek, sp. nov.


Plantaee agamospermae submedici, foliis obscure viridibus, linear-oblanceolatis, subglabris, pinnatisectis, lobis lateralisibus 4 ad 6 utrinque, late triangularibus, recurvis, petiolis alatis purpurascens, phyllaribus involucralibus exteriusribus 11 ad 13, ovato-lanceolatis usque ovatis, obscure viridibus, late pallide marginatis, laxe adpressis, stigmatibus subgla­brosus, antheris polliniferis, achenis 4.3–4.5 mm longis, superne dense squamulo-so-spinulosis, persensim in pyramidem subcylindricam 0.8–1 mm longam abeuntibus.

Herbs to 15 cm tall. Petiole grayish purple to bright purple, winged; leaf blade grayish green, often slightly suffused brownish purple, and with a light purplish midvein, linear-oblongate to narrowly oblong, 9–13 × 1.7–2.5 cm, very sparsely arachnoid, pinnatisected to shallowly pinnatissect but sometimes undivided and coarsely dentate; lateral lobes 4–6 pairs, broadly triangular, to 8 × 10 mm, recurved, proximal margin ± straight and usually entire, distal margin straight or shallowly sigmoid and entire or sparsely denticulate, apex acute; interlobes not conspicuous, short and broad, margin ± entire or with a few small teeth; terminal lobe ± narrowly triangular to almost helmet-shaped, 1.5–3 × 1.5–2 cm, terminal segment subacute to acute, distal margin ± convex and entire or irregularly shallowly lobulate-dentate. Scapes pinkish green at base, purple above after anthesis, ± equaling leaves, arachnoid but later glabrescent. Capitulum ca. 1.5 cm wide, remaining partly closed. Involucre 8–9 mm wide, base flat to subtruncate. Outer phyllaries 11–13, dark green middle part with a gradual transition into light green to whitish green border, ± not imbricate, ovato-lanceolate to ovate, outermost ones 4–6 × 2.5–3.8 mm and 1/3–1/2 as long as inner ones, loosely appressed, border to 1.5 mm wide, margin 0.1–0.2 mm, membranous, subglabrous, and purplish on distal ca. 1/3, apex flat or dark callose; inner phyllaries ca. 1 cm. Ligules dark yellow; outer ligules canaliculate, outside striped grayish purple; inner ligules with yellow or purplish teeth at apex; ligule tube pubescent. Stigmas deep yellow. Anthers polliniferous; pollen grains irregular in size. Achenes light grayish straw-colored brown, (3.5–)4.3–4.5 × 0.7–0.8 mm; body with ± prominent lateral ridges, ± sparsely spinulose above, very gradually narrowing into a subcylindrical 0.8–1 mm cone; beak ca. 7 mm. Pappus ± white, 6–7 mm. Fl. late spring. Agamosperm.

无毛蒲公英 wu mao pu gong ying
82. Taraxacum subcontristans Kirschner & Štěpánek, sp. nov.

Type: China. Xinjiang: “In pascuo, coord. geogr.: 41°49′56″N, 82°24′05″E” [Baicheng Xian 拜城县], 1127 m, May 1999, P. Sekerka, Zhang Dao Yuan & V. Huml s.n., cultivated as JŠ 7374 (holotype, PRA; isotypes, MO, PE, PRA).


Planta agamospermae subrubrostaurae, foliis glaucescenti-viridibus, anguste lanceolatis vel angustis ellipticis, subglabris, irregulariter pinnatisectis, lobis lateralibus 5 vel 6 utrinque, lineari-triangulatis vel anguste triangulatis, patentibus vel recurvis vel sursum curvatis, marginibus distalibus dentatis et lobulatis, interlobis grosse dentatis vel lobulatis, petiolis alatis, griseo-purpureascentibus, phyllaris involucralibus exterioribus 13 ad 17, olivaceo-viridibus, imbricatis, ovaris usque subrutilatis, laxe adpressis usque erectis, marginibus pallide marcescentibus 0.2–0.6 mm latis, stigmatibus luteo-viridibus, antheris polliniferis, achenis 4.5–4.7 mm longis, superne dense spinulosis, in pyramide subcylindricam 0.9–1.1 mm longam subabrupte abruptis.

Herbs 20–25 cm tall. Petiole grayish purple, winged; leaf blade slightly grayish green, often suffused brownish, and with a purplish brown midvein, ± narrowly obovate, 12–18 × 2–3.5 cm, subglabrous, pinnatisect; lateral lobes 3 or 4(5) pairs, narrowly deltoid to hamate, with recurved distal part 0.8–1.5 cm, proximal margin entire, distal margin convex to sigmoid and with 1–3 distinct teeth, apex acute; interlobes brownish purple spotted, to 10 × 4 mm, margin usually entire; terminal lobe helmet-shaped to lingulate, 2–3.5 × 1.5–2.5 cm, distal margin concave and subentire or with asymmetric incisions. Scapes purplish at base, brown-purple below capitulum, and otherwise light green, ± equaling leaves, sparsely arachnoid. Capitulum ca. 2.5 cm wide. Involucre 8–10 mm wide, base rounded. Outer phyllaries 14–17; light green suffused purplish at apex, subimbricate, broadly ovate to ovate-lanceolate, outermost ones 7–8.5 × 3.5–5.5 mm and ca. 2/3 as long as inner ones, loosely appressed to irregularly erect-patent, vena-tion visible, border 0.2–0.4 mm wide and membranous, margin sparsely ciliate, apex flat or callose; inner phyllaries 1.1–1.2 cm. Ligules yellow; outer ligules ± flat, outside striped purplish grayish brown; inner ligules with purplish teeth at apex; ligule tube pubescent. Stigmas yellowish green, abaxially blackish pubescent. Anthers without pollen or pollen sparsely developed; pollen grains irregular in size. Achene light grayish straw-colored brown, 4.4–4.5 × 0.9–1.1 mm; body ± winged with prominent lateral ridges, densely spinulose above, subabruptly narrowing into a subcylindric 0.9–1 mm cone; beak 1.1–1.2 cm. Pappus dirty white, ca. 8 mm. Fl. late spring. Agamosperm.

83. Taraxacum aeneum Kirschner & Štěpánek, sp. nov.


Paratypes: China. Xinjiang: ibidem, P. Sekerka, Zhang Dao Yuan & V. Huml s.n., as JŠ 7389 (PRA); “In pascuo, coord. geogr.: 41°49′56″N, 82°24′05″E” [Baicheng Xian 拜城县], 1127 m, May 1999, P. Sekerka, Zhang Dao Yuan & V. Huml s.n., as JŠ 7372 (PRA).

Planta agamospermae mediovae, foliis subglaucescenti-viridibus, anguste obovatis, subglabris, pinnatisectis, lobis lateralibus 3 vel 4(5) utrinque, interlobis integerrimis bado-purpureascentibus, phyllaris involucralibus exterioribus 14 ad 17, pallide viridibus, venosis, late ovatis usque ova-to-lanceolatis, subimbricatis, laxe adpressis vel irregulariter erecto-patentibus, stigmatibus luteo-viridibus, antheris polliniferis, achenis 4.4–4.5 mm longis, superne dense spinulosis, in pyramide subcylindricam 0.9–1.1 mm longam subabrupte abruptis.

Herbs 16–20 cm tall. Petiole grayish purple, unwinged; leaf blade slightly grayish green, often suffused brownish, and with a purplish brown midvein, ± narrowly obovate, 12–18 × 2–3.5 cm, subglabrous, pinnatisect; lateral lobes 3 or 4(5) pairs, narrowly deltoid to hamate, with recurved distal part 0.8–1.5 cm, proximal margin entire, distal margin convex to sigmoid and with 1–3 distinct teeth, apex acute; interlobes brownish purple spotted, to 10 × 4 mm, margin usually entire; terminal lobe helmet-shaped to lingulate, 2–3.5 × 1.5–2.5 cm, distal margin concave and subentire or with asymmetric incisions. Scapes purplish at base, brown-purple below capitulum, and otherwise light green, ± equaling leaves, sparsely arachnoid. Capitulum ca. 2.5 cm wide. Involucre 8–10 mm wide, base rounded. Outer phyllaries 14–17; light green suffused purplish at apex, subimbricate, broadly ovate to ovate-lanceolate, outermost ones 7–8.5 × 3.5–5.5 mm and ca. 2/3 as long as inner ones, loosely appressed to irregularly erect-patent, vena-tion visible, border 0.2–0.4 mm wide and membranous, margin sparsely ciliate, apex flat or callose; inner phyllaries 1.1–1.2 cm. Ligules yellow; outer ligules ± flat, outside striped purplish grayish brown; inner ligules with purplish teeth at apex; ligule tube pubescent. Stigmas yellowish green, abaxially blackish pubescent. Anthers without pollen or pollen sparsely developed; pollen grains irregular in size. Achene light grayish oliveaceous brown, 4.4–4.5 × 0.9–1.1 mm; body ± winged with prominent lateral ridges, densely spinulose above and conspicuously so on ridges, subgradually narrowing into a subcylindric 0.9–1.1 mm cone; beak 8–9 mm. Pappus white, ca. 7 mm. Fl. late spring. Agamosperm.

Paratypes: Pastures, grasslands, ruderal lawns; 1000–1400 m. W Xinjiang, S Xizang.
84. Taraxacum simulans Kirschner & Štěpánek, sp. nov.

亚大斗蒲公英 ya da dou pu gong ying


Plantae agamospermae subparvae, foliis saturate viridibus, saepissime brunnescentibus, oblanceolatis, pinnatisectis, lobis lateralibus 4 ad 6 utrinque, triangularibus vel angustis triangularibus, subrecurvatis, integerrimis, phyllarisis involucralibus exterioribus 17 ad 20, imbricatis, obscure olivaceo-viridibus vel atro-viridibus, lanceolatis usque ovatis, late adpressis, apice plantis vel subcircularibus, stigmatibus luteovirescentibus, antheris polliniferis, achenis 3.8–4 mm longis, superne dense spinulosis, in pyramiden saepissime subconicam 0.8–0.9 mm longam subabrute abeuntibus.

Herbs 12–15 cm tall. Petiole grayish purple, winged; leaf blade grayish green, usually suffused bronze, and with a light purplish gray midvein, narrowly oblate to oblongate, 6–12 × 1.7–3.7 cm, very sparsely arachnoid, regularly pinnatisect; lateral lobes 4–6 pairs, triangular or narrowly triangular, to 1.5 × 1.2 cm, subrecurved, distal margin ± straight and entire, proximal margin entire or with a single broadly triangular tooth at base, apex acute; interlobes not spotted or faintly spotted, ca. 6 × 4–8 mm, margin usually ± entire; terminal lobe triangular, broadly triangular, or sometimes ± helmet-shaped, terminal segment with an entire margin, apex acute. Scapes purple-green at base but otherwise light green, ± equaling leaves, arachnoid. Capitulum 2.5–3 cm wide. Involucre 8–9 mm wide, base flat.


新源蒲公英 xin yuan pu gong ying

Herbs 5–18 cm tall. Petiole ± purplish, narrow; leaf blade mid-green, ± broadly oblongate, 4–10 × 1.5–3.5 cm, sparsely arachnoid but later glabrescent, deeply pinnatisect; lateral lobes 3–5, ± triangular to triangular-deltoid, subpatent to ± recurved, distal margin convex and entire or with 1 or 2 teeth; interlobes broad, margin dentate and/or lobulate; terminal lobe triangular to helmet-shaped, margin ± entire. Scapes greenish, ± overtopping leaves, sparsely arachnoid but densely so below capitulum. Involucr 6–7 mm wide, base ± rounded. Outer phyllaries 17–20, dark olivaceous green to blackish green and suffused purplish distally, imbricate, lanceolate to ovate, outermost ones 7–8 × 3–4 mm and 1/2–3/5 as long as inner ones, loosely appressed, border whitish membranous and 0.1–0.2 mm wide, margin sparsely ciliate, apices ± flat or coriaceous; inner phyllaries 1.2–1.3 cm. Ligules deep yellow; outer ligules flat, outside striped greenish gray; inner ligules with yellow teeth at apex; ligule tube pubescent. Stigmas dirty (greenish) yellow. Anthers polliniferous; pollen grains irregular in size.

Achene light grayish straw-colored brown, 3.8–4 × 0.9–1 mm; body ± densely spinulospe above, subapically narrowing into a subconic to subcylindric 0.8–0.9 mm cone; beak 8–8.5 mm. Pappus ± white, ca. 5 mm. Fl. late spring. Agamosperm.
Taraxacum xinyuanicum is the first sexual taxon recognized within T. sect. Quisera.


Herbs 15–35 cm tall. Petiole pinkish green, narrow; leaf blade pale green to mid-green, ± oblanceolate, 10–15 × 2.5–3.5 cm, sparsely arachnoid but later glabrescent, margin subentire to shallowly lobed; lateral lobes 2–5, ± flat triangular, ± recurved, distal margin straight and entire or dentate; interlobes indistinct; terminal lobe not clearly developed, broadly triangular, apex ± acute. Scapes brownish green, ± overtopping leaves, subglabrous. Involucre 9–10 mm wide, base rounded.

Outer phyllaries 13–16, dark green with a broad paler border, subimbricate, ovo-lanceolate to lanceolate, outermost ones 7–9 × 3–4 mm and ca. 1/2 as long as inner ones, ± appressed, border 0.5–1 mm, margin sparsely ciliate, flat and not corniculate below apex; inner phyllaries 1.3–1.8 cm, apically flat. Ligules (?pale) yellow; outer ligules flat, outside stripped dark; inner ligules with purplish long teeth. Stigmas dark to blackish green. Achene grayish straw-colored brown, 4.2–4.7 × 1–1.1 mm; body ± smooth below, apically subsparsely spinulose with thin acute spinules, ± subapically narrowing into a conic 0.7–0.9 mm cone; beak ca. 6 mm. Pappus yellowish white, ca. 5 mm. Fl. summer. Agamosperm.

Mountain slopes; 2000–2400 m. W Xinjiang (Tian Shan).

Taraxacum xinyuanicum is based on a single wild specimen and a few cultivated plants. The taxon has many features of T. sect. Quisera and many others it approaches T. sect. Cera toidea (achene characters, outer phyllary color, shape, and posture), but


Herbs to 25 cm tall, subrobus t. Petiole purplish, winged; leaf blade grayish green with a pinkish midvein, oblanceolate to broadly linear, 10–18 × 2.5–5 cm, subglabrous, regularly deeply lobed; lateral lobes 3–6 pairs, triangular, ± patent, apical margin concave and entire or minutely dentate, apex acuminate; terminal lobe triangular, apex subobtuse. Scapes brownish green, ± equaling leaves, apically arachnoid when young. Capitulum ca. 4 cm wide. Involucrc 1.1–1.5 cm wide, base broadly rounded. Outer phyllaries 15–19, ± imbricate, ovate to ovo-lanceolate, outermost ones 8–11 × 3–4.5 mm and ca. 1/2 as long as inner ones, loosely appressed to erect, usually not distinctly veined, middle part blackish green, border whitish pale green and to 1 mm wide, margin glabrous, not corculate below apex; inner phyllaries 1.7–1.8 cm. Ligules deep yellow; outer ligules outside stripped purplish; inner ligules with pinkish apical teeth; floret tube pubescent. Stigmas greenish. Anthers polliniferous; pollen grains irregular in size. Achene grayish straw-colored brown, 3.8–4 × 0.8–0.9 mm; body ± smooth below, apically spinulose with thin long acute spinules, ± gradually narrowing into a cylindrical 0.8–1 mm cone; beak ca. 8 mm. Pappus pure white, 5–6 mm. Fl. spring. Agamosperm.

Grasslands; ca. 1300 m. SW Xinjiang (Kashi).


Herbs 10–20(–25) cm tall. Petiole pale green or sometimes pinkish, ± winged; leaf blade bright light green with a greenish midvein, oblanceolate, (8–)10–14(–23) × 2–3 cm, sparsely arachnoid, sometimes undivided, usually pinnatilobed to pinnatisect; lateral lobes 4 or 5, triangular to deltoid, ± patent to subrecurved, distal margin usually convex to ± sigmoid and subentire, apex acute; interlobes ca. 10 × 5–8 mm, margin entire or sparsely denticulate; terminal lobe flat-triangular to flat-deltoid, margin entire, apex mucronate. Scapes pale green at base but brownish green above, usually overtopping leaves, floccose-arachnoid and densely so below capitulum. Capitulum 2.5–3.5 cm wide. Involucrc 9–10 mm wide, base rounded to slightly obconic. Outer phyllaries (12 or)13–15(or 16), light green, ± not imbricate, ovo-lanceolate to lanceolate, outermost ones 5.5–8
× 2–3 mm and 2/5–2/3 as long as inner ones, loosely appressed, erect to rarely irregularly patent, border ± distinct, whitish membranous, and 0.3–0.5(–0.9) mm wide, margin ± glabrous, apex suffused red with a short obtuse horn to 1 mm; inner phyllaries 1.3–1.5 cm, calloso to minutely (ca. 0.3 mm) corniculate near apex. Ligules yellow; outer ligules ± flat, outside broadly striped grayish pink; inner ligules with dirty yellow or pinkish apical teeth. Stigmas dirty yellow to slightly greenish yellow. Anthers polliniferous; pollen grains irregular in size. Achene grayish pale brown, (3.6–)4.2–4.5(–5) × (0.8–)0.9–1.2 mm; body densely spinulose in upper 1/3–1/5, subgradually to sub-


角状蒲公英组 jiao zhuang pu gong ying zu

Leaves usually slightly fleshy, light green to pale glaucous-green, sometimes suffused bronze, not spotted, subglabrous. Outer phyllaries usually light to yellowish green with an indistinct paler or whitish border but often reddish near apex, usually appressed to loosely appressed or erect, ovate, lanceolate, or rarely linear-lanceolate, usually 4–6.5 × 1–3.5 mm, apex with horn or at least corniculate. Outer ligules usually pale yellow, outside striped faintly reddish. Stigmas pure yellow. Achene light grayish straw-colored brown, usually 3–5 mm, to 0.9 mm wide; body relatively densely spinulose above, gradually to subgradually narrowing into sub-conic to subcylindric (0.7–)0.8–1(–1.6) mm cone, spinules usually thin, straight, erect, and acute; beak (3.5–)5–7(–8.5) mm. Pappus white, 5–6.5 mm. Fl. spring and early summer. Agamosperm. 2n = 24.

About six to eight species; centered in C Asia; two species in China.

Taraxacum glaucanthum (Ledebour) Candolle (Prodr. 7: 147. 1838, not Nakai & Koidzumi, 1936), another member of T. sect. Ceratoidea, was described from NE Kazakhstan in the vicinity of the Chinese border and might be detected in northwesternmost Xinjiang.

Taraxacum monochlamydeum Handel-Mazzetti (Monogr. Taraxacum, 43. 1907) was repeatedly reported to occur in Xinjiang (since G. E. Haglund in Persson, Bot. Not. 1938: 310. 1938). During that time, T. bicerne was believed to be a member of T. sect. Ceratophora (Handel-Mazzetti) A. P. Khokhrjakov (= T. sect. Borealu in the present treatise) and generally overlooked. Schischkin and Tzvelev (Fl. URSS 29: 483. 1964) recognized T. bicerne as a member of T. sect. Macrocornuta s.l. The Chinese material seen, partly also identified as T. monochlamydeum by G. E. Haglund, belongs to T. bicerne, and T. monochlamydeum probably is confined to more western parts of C Asia (being common in Turkmenistan and Uzbekistan). The occurrence of T. monochlamydeum in China remains to be confirmed, and further study is needed.

1a. Stigmas dirty yellow to light greenish yellow; pollen grains irregular in size; involucre 9–10 mm wide at base; paler outer phyllary border 0.3–0.9 mm wide ...

90. T. brevicorniculatum (see T. sect. Qaisera)

1b. Stigmas pure yellow; pollen grains regular in size; involucre to 8 mm wide at base; paler outer phyllary border 0.1–0.4 mm wide.

2a. Leaf lateral lobes with entire distal margin; inner phyllaries with a thin horn; achene beak 3–4.5 mm .......... 91. T. koksaghyz

2b. Leaf lateral lobes with denticulate distal margin; inner phyllaries with a thick short horn; achene beak 7–9 mm .......................................................... 92. T. bicerne


橡胶草 xiang jiao cao

Herbs 4–15 cm tall. Petiole pale green, winged; leaf blade light grayish green grayish green with a light green to rarely pinkish midvein, narrowly oblancoate to broadly oblancoate, 3–7(–10) × 1.2–3 cm, ± fleshy, very sparsely arachnoid to glabrous, undivided, margin remotely denticulate to regularly pin-natilobed to pinnatifid; lateral lobes 2 or 3(–5) pairs, broadly triangular, paten to subcurved, proximal margin ± straight and entire, distal margin convex and entire, apex obtuse to sub-acute; interlobes not spotted, broad, margin entire; terminal lobe usually triangular, margin entire, apex subobtuse. Scapes light green or pinkish, ± overtopping leaves, arachnoid. Capitulum 2–3 cm wide. Involute 5–8 mm wide, base obconic-rounded. Outer phyllaries 8–13, light green sometimes distally suffused purplish, not imbricate, linear-lanceolate to narrowly ovate, outermost ones 5.5–7 × (1–)1.2–2.2(–2.5) mm and 1/2–4/5 as long as inner ones but sometimes equaling them, loosely appressed to erect, border whitish light green or ± membranous and 0.1–0.3 mm wide, margin sparsely ciliate to glabrous, apex with a 2.5–4 mm horn of perpendicular to erect position; inner phyllaries 8–12 mm, apex with a thin 1–2 mm horn. Ligules light yellow; outer ligules flat, outside not striped or faintly striped purplish; inner ligules with yellow teeth at apex. Stigmas pure yellow. Anthers polliniferous; pollen grains regular in

Meadows and pastures, usually on subalpine soils; 1500–2000 m.

W Xinjiang [Kazakhstan].

Taraxacum brevicorniculatum is often a weed in plantations of T. koksaghyz in Russia and other countries where T. koksaghyz is grown as a source of biosynthetic rubber. Taraxacum brevicorniculatum is often mistakenly equated or confused with the sexual diploid T. koksaghyz of T. sect. Ceratoidea, which can be distinguished by purely yellow stigmas, fleshy glaucous grayish green leaves, obtuse leaf lobes, outer phyllaries with thin mostly 2.5–4 mm horns, inner phyllaries with thin mostly 1.7–2 mm horns, regular pollen, and achenes 2.8–3.8 × 0.7–0.9 mm with a beak to 4.5 mm. Taraxacum brevicorniculatum also has a much lower root rubber content. Genetic analyses (P. van Dijk, unpubl.) show that the triploid T. brevicorniculatum is a hybridogenous species with T. koksaghyz as one of the parental taxa. Taraxacum brevicorniculatum is in many respects intermediate between T. sect. Ceratoidea and T. sect. Qaisera.
size. Achene light grayish straw-colored brown, 2.8–3.8 × 0.7–0.9 mm; body ± densely spinulose above, subgradually narrowing into a subcylindric (0.5–)0.7–1 mm cone, spinules usually irregularly bent upward and not squamulose; beak 3–4.5 mm. Pappus ± white, 3.5–4.5 mm. Fl. late spring and early summer. Sexual. 2n = 16.

Medium-moist subsaline pastures with *Achnatherum splendens*, path margins, riverbanks; 1600–2000 m. W Xinjiang [Kazakhstan].


**Double角蒲公英** shuang jiao pu gong ying

Herbs 4–17 cm tall. Petiole pale green, narrowly winged; leaf blade glaucous-green with a light green to pinkish midvein, narrowly oblancoolate to narrowly oblong, 3–12 × 1.1–2.5 cm, slightly fleshy, glabrous, shallowly pinnatifid to pinnatifid; lateral lobes usually 4 or 5 pairs, deltoid, falcate, or broadly deltoid-triangular, patent to hamate-recurred, proximal margin ± entire, distal margin ± denticate, apex acute; interlobes often bordered reddish, margin subentire; terminal lobe triangular to 3-partite, margin ± entire, apex acute to subobtuse. Scapes brownish or purplish green, often overtopping leaves, arachnoid. Capitulum 2–3 cm wide. Involucrc 5–8 mm wide, base narrowly rounded. Outer phyllaries 9–14, light green, sometimes suffused purplish, ± not imbricate, ovate to broadly lanceolate, outermost ones 4–6(–7) × 1.7–2.8 mm and 1/4–1/3 as long as inner ones, loosely appressed to erect, border indistinct, whitish light green, with a gradual transition, and 0.4–0.6 mm wide, margin ± glabrous, apex with a ± thick suberect horn to 2 mm; inner phyllaries 1–1.4 cm, apex with thick short horn and often laterally dilated. Ligules light yellow; outer ligules flat, outside striped brownish purple; inner ligules with yellow teeth at apex; ligule tube pubescent. Stigmas pure yellow. Anthers polliniferous; pollen grains regular in size. Achene light grayish straw-colored brown, 3.7–4.2 × 0.8–0.9 mm; body ± densely spinulose above, subgradually narrowing into a subcylindric 0.8–1 mm cone, spinules thin, usually suberect, and not squamulose; beak 7–9 mm. Pappus bright white, 5–6 mm. Fl. late spring and early summer. Sexual.

Subsaline pastures, grasslands; 600–1800 m. Gansu, Qinghai, Xinjiang [Kazakhstan, Kyrgyzstan].

Reports of *Taraxacum bicone* from Nei Mongol and Ningxia (Higher Pl. China 11: 779. 2005) remain to be proven.


**大角蒲公英组** da jiao pu gong ying zu

Leaves deep green and suffused purplish or spotted on interlobes, usually thin, not thickened; petiole ± unwinged; leaf blade undivided to pinnatisect in a complicated manner. Outer phyllaries dark green, blackish green, or mid-green but often with a purplish apex or borders or entirely suffused purplish, linear-lanceolate to ovate-lanceolate, usually arctuate to patent or rarely erect-patient, apex calllose to coronulate; inner phyllaries often of unequal width, apex flat to horned. Stigmas usually discolored. Achene grayish straw-colored brown, usually 3–4 × 0.8–1 mm; body ± densely spinulose above, subapically to ± gradually narrowing into a subcylindric to cylindric 0.4–2 mm cone, spinules usually long, thin, and erect-patient; beak usually longer than 7–8 mm, thin. Pappus snow white.

About 25 species: centered in the region from Iran to C Asia; one species in China.

*Taraxacum* sect. *Macrocornuta* in China requires additional study where only one species was identified with certainty, but the diversity might be higher.

*Taraxacum* sect. *Macrocornuta* was not subjected to a taxonomic revision. The names published on the material from the vicinity of China form a complex of agamospermous and sexual populations, and without a field population study it is difficult to delimit individual taxonomic units. *Taraxacum alasanticum* Schischkin (Fl. URSS 29: 477, 731. 1964), *T. lipskyi* Schischkin (Fl. Turkmen. 7: 383. 1960), and *T. longipyramidatum* Schischkin (Fl. URSS 29: 489, 735. 1964) were reported from Xinjiang (C. H. An, Fl. Xinjiang. 5: 420, 425, 426. 1999; FRPS 80(2): 37, 48, 49. 1999), but both the complexity of the group and the lack of convincing material to prove the records make it advisable not to include these names in the present treatise. *Taraxacum wallichii* Candolle is a sexual taxon described from India; the name usually covers the whole section in the literature. We have failed to find any Chinese material approaching the morphology of *T. wallichii*.

The name *Taraxacum repandum* N. Pavlov refers to a taxon occurring in southwesternmost Tian Shan in Kazakhstan. It is a morphologically peculiar species, rather isolated in the flora of C Asia, and difficult to assign to a section. It might belong to *T. sect. Macrocornuta* as a marginal member, but further study is needed. We consider the report of its occurrence in China (FRPS 80(2): 63. 1999) as an error.


**多绒蒲公英** duo ting pu gong ying

Herbs 12–25 cm tall. Petiole purple, unwinged; leaf blade mid-green with a pinkish midvein, narrowly oblancoolate, 4–17 × 1.5–3 cm, subglabrous to glabrous, shallowly pinnatifoliated to pinnatisect but sometimes undivided and margin dentate; lateral lobes usually 2–4 pairs, deltoid to narrowly triangular, usually patent, proximal margin ± entire, distal margin ± entire or rarely remotely denticate, apex subacute; interlobes broad, margin subentire; terminal lobe ± triangular, margin ± entire, apex subacute. Scapes purple, overtopping leaves, glabrescent. Capitulum 2.5–3.5 cm wide. Involucrc ca. 1 cm wide, base rounded. Outer phyllaries 8–12, light green, slightly pruinose, and later suffused brownish pink, not imbricate, ovate to broadly lanceolate, outermost ones 4–7 × 2.5–4 mm and 1/3–1/2 as long as inner ones, reflexed with tips pointing toward scape, border indistinct, membranous, or pinkish and ca. 0.1 mm wide, margin ± glabrous, apex flat to coronulate; inner phyllaries 1.2–1.4 cm, apex dark coronulate. Ligules light yellow; outer ligules flat, outside striped faintly light grayish green; inner ligules with
yellow or light grayish teeth at apex; ligule tube pubescent. Stigmas light grayish green. Anthers polliniferous; pollen grains regular in size. Achene light grayish straw-colored brown, 3.7–4.2 × 0.7–0.9 mm; body ± densely spinulose above or often almost throughout, ± gradually narrowing into a subcylindrical 1–1.5 mm cone, spinules thin and usually suberect; beak 6–8 mm. Pappus bright white, 5–6 mm. Fl. spring and early summer. Sexual. 2n = 16.

Ruderal sites, pastures, along roads and paths, grasslands; 1200–2000 m. W Xinjiang [Kazakhstan].


Type: Taraxacum subglaciale Schischkin.

Plantae alpinae vel subnivales graciles, foliis plerumque indivisis, lobulatis, lineari-lanceolatis vel oblongo-lanceolatis, scapis plerumque glaberrimis, phyllariis involucralibus exterioribus non imbricatis vel inconspicue imbricatis, anguste lanceolatis usque lanceolatis, plerumque in parte media latissimis, subobtusis, planis vel callosis, raro minute callosi, suberecti vel in pyramidem indistinctam, raro late conici sensim abientibus, rostro crassiusculo disrumpente 1.5–5(–7) mm longo, pappo albo-lutescente 4–7 mm longo.

Plants delicate, usually glabrous to subglabrous. Petiole unwinged; leaf blade usually narrow, undivided or shallowly lobed. Capitulum often nodding after anthesis. Outer phyllaries 1–15, dark green to black, ± of equal length, appressed, loosely appressed, or rarely erect, narrowly lanceolate to lanceolate, usually broadest in middle, almost unbordered to bordered, margin usually glabrous but seldom sparsely ciliate, apex without a horn but sometimes callose. Ligules yellow, lilac, pinkish to violet. Achene usually grayish straw-colored brown to blackish brown, (3.9–)4–5(–5.7) × 0.8–1 mm; body smooth or less often sparsely minutely tuberculose above, cone absent or achene body gradually narrowing into an indistinct cone, cone (when developed) broadly conical to conical and 0.4–0.8 mm; beak 1.5–5(–7) mm, ± thick, easily breaking off. Pappus yellowish white or white, 4–7 mm.

About 15 species: C Asia; five species (one endemic) in China.

Taraxacum sect. Atrata has a center of diversity in NW China (W Xinjiang), Kazakhstan, Kyrgyzstan, NW Mongolia, and perhaps elsewhere in C Asia.

Taraxacum sect. Oligantha is the closest section to T. sect. Atrata but differs from it in having densely hairy scapes, imbricate and hairy outer phyllaries (often hairy on adaxial and/or abaxial surfaces and callosite) of paler color, outer phyllaries with a blackish corniculate apex, achene beak very thick (not caducous), and pappus fragile. Another similar taxon, T. glabrum of T. sect. Glabra, differs in the well-developed distinctly narrower cone and thin beak.

In addition to the species given below, there is another name, Taraxacum alpigenum Dshanaëwa (Fl. Kirgizsk. S.S.R. 1: 116. 1967), based on the material from a border range between W Xinjiang and Kyrgyzstan (Torugart Range). We have not seen the original material, and the protologue does not give enough facts to compare the name with the other members of the section (with the exception of the achene characters). If it proves to be a separate species, it should be included in the Chinese flora.


黑蒲公英组 hei pu gong ying zu

Herbs 5–12 cm tall. Petiole pale green, ± unwinged; leaf blade probably mid-green, oblong-lanceolate, 6–8 × 1.5–2 cm, glabrous, pinnatilobed, midvein pale green; lateral lobes 2 or 3 pairs, triangular to deltoid, to 1 cm, usually patent, margin usually entire; interlobes short, broad, margin ± entire; terminal lobe triangular. Scapes brownish green, ± equalling leaves, glabrous. Capitulum 2–3 cm wide. Involucre 8–11 mm wide, base rounded. Outer phyllaries 11–14, almost black, ± imbricate, ovate to ovate-lanceolate, outermost ones 5–7 × 2.5–4 mm and ca. 1/2 as long as inner ones, ± appressed to suberect, unbordered, margin ± glabrous, flat below apex; inner phyllaries 1.3–1.7 cm, flat below apex. Ligules yellow; outer ligules outside striped grayish pink; inner ligules with purple to blackish teeth. Stigmas blackish green. Anthers polliniferous. Achene grayish straw-colored brown, 4.5–5.2 × 0.9–1 mm; body ± smooth or apically very sparsely minutely tuberculose, very indistinctly and gradually narrowing into a broadly conic 0.6–0.9 mm cone or cone not discernible at all; beak 4–5 mm, thick. Pappus ± white, 6–7 mm. Fl. summer.

● Alpine slopes; ca. 3500 m. W Xinjiang (Tian Shan).
**Taraxacum sinotianschanicum** is known from the type specimen only. It deviates from the most common pattern of *T.* sect. *Atrata* in having outer phyllaries ± imbricate and of a broader shape.

95. **Taraxacum goloskokovii** Schischkin, Fl. URSS 29: 748. 1964.

小叶蒲公英  xiao ye pu gong ying

Herbs 5–8 cm tall. Petiole pinkish green, ± unwinged; leaf blade mid-green, linear to oblong-lanceolate, 5–8 × 0.3–0.5–0.7(–1.2) cm, glabrous, undivided, margin entire or with irregular short linear lateral teeth (1–3 on each side) or pinnatisect; lateral lobes 2 or 3 pairs, linear-triangular, to 5 mm, usually subrecurved, margin entire; interlobes narrow, margin ± entire; terminal lobe linear-triangular, base sagittate. Scapes brownish green, equaling leaves, glabrous. Capitulum ca. 1.5 cm wide. Involucre 6–7 mm wide, base ± rounded. Outer phyllaries 10–15, deep grayish green, not imbricate, narrowly lanceolate, outermost ones 5–6(–7) × 1.3–2 mm and ca. 1/2 as long as inner ones, ± appressed to loosely appressed, border paler, narrow, and indistinct or sharply delimited and 0.1–0.3 mm wide, margin glabrous, flat to blackish callose below obtuse apex; inner phyllaries 1–1.2 cm, flat to subcomniculate below apex. Ligules yellow; outer ligules outside striped pinkish black. Stigmas yellowish green. Anthers polliniferous; pollen grains irregular in size. Achene straw-colored brown, 4.5–5 × 0.9 mm; body ± smooth or apically with a few almost invisible tubercles, coned not discernible or broadly conic and 0.6–0.8 mm; beak 4–4.5 mm, ± thick. Pappus ± white, ca. 5 mm. Fl. summer. Agamosperm.

Along alpine streams, stream terraces; 3000–3700 m. SW Xinjiang [Kazakhstan].


窄边蒲公英  zhai bian pu gong ying


Herbs 5–10 cm tall. Petiole ± green, narrowly winged; leaf blade mid-green, ± oblanceolate, 5–8 × 1.2–2 cm, glabrous, undivided to shallowly sinuate-lobed, margin entire; lateral lobes 1 or 2 pairs, broadly triangular, to 5 mm, ± patent, margin entire; interlobes not distinctly developed, margin entire; terminal lobe broadly triangular, margin entire. Scapes brownish green, equaling leaves, glabrous. Capitulum ca. 2 cm wide. Involucre 8–10 mm wide, base narrowly rounded. Outer phyllaries 7–9, blackish green to deep grayish green, not imbricate, lanceolate to narrowly lanceolate, often broadest in middle or tapering from base, outermost ones 5–7 × 1.5–2.3 mm and ca. 1/2 as long as inner ones, ± appressed, border paler, narrow, and not always distinct or to 0.3 mm wide, margin glabrous or rarely sparsely ciliate, apex ± flat; inner phyllaries 1.1–1.4 cm, apex flat. Ligules yellow; outer ligules outside striped grayish pink. Stigmas yellow to dirty yellow. Anthers polliniferous; pollen grains irregular in size. Achene grayish straw-colored brown, 4.4–4.5 × 0.9 mm, smooth to very sparsely minutely tuberculata above, cone indistinct with body very gradually narrowing in beak; beak 2.5–4 mm, ± thick. Pappus white, 5–6 mm. Fl. summer. Agamosperm.

Plants morphologically similar to *Taraxacum lilacinum* but sexual have been reported (D. T. Zhang et al., Acta Bot. Boreal.-Occid. Sin. 17: 1–7, 1997), and their status remains to be studied.


寒生蒲公英  han sheng pu gong ying

Herbs 4–8 cm tall. Petiole purplish, unwinged; leaf blade mid-green, ± linear, 4–6 × 0.5–0.8 cm, glabrous, usually with a few lobules or pinnatisect but sometimes undivided; lateral lobes 1 or 2 pairs, linear-triangular to linear, usually ± recurved, margin entire; interlobes narrow, margin entire; terminal lobe linear, elongated-lingulate, basal segments ± linear and subcurved. Scapes brownish green, overlapping leaves, glabrous. Capitulum ca. 1.5 cm wide. Involucre 5–6 mm wide, base subobconic. Outer phyllaries 8–10, middle part deep grayish green with a very gradual transition into paler border, not imbricate, ± narrowly lanceolate, outermost ones 4.5–5 × ca. 1.5 mm and ca. 1/3 as long as inner ones, ± appressed to loosely appressed, border narrow, paler grayish green to whitish, and 0.2–0.3 mm wide, margin glabrous, flat below apex; inner phyllaries 1–1.2 cm, flat to blackish callose below apex. Ligules yellow. Stigmas yellowish green. Anthers polliniferous; pollen grains irregular in size. Achene grayish straw-colored brown, 3.9–4.1 × ca. 0.9 mm; body ± smooth or apically with a few almost invisible tubercles, coned not discernible or broadly conic and 0.6–0.8 mm; beak 4–4.5 mm, ± thick. Pappus ± white, ca. 5 mm. Fl. summer. Agamosperm.

Alpine slopes, on moist shallow soils; 3500–4500 m. Xinjiang [Kazakhstan].


紫花蒲公英  zi hua pu gong ying

Herbs 4–12 cm tall. Petiole green to pinkish, unwinged; leaf blade mid-green, ± spatulate-oblancoate, 2.5–8 × 0.5–1.7 cm, glabrous, undivided, margin usually remotely dentate or less often with remote short triangular lobules, apex subacute. Scapes brownish green, usually overtopping leaves, glabrous. Capitulum 2–2.5 cm wide. Involucre 7–9 mm wide, base broadly rounded. Outer phyllaries 8–13, middle part deep grayish green to blackish green, ± not imbricate, ± lanceolate, often broadest in middle, outermost ones 4–5(–8) × 1.5–2.3 mm and 1/2–2/3 as long as inner ones, ± appressed, unbordered or with a gradual transition into paler to whitish 0.1–0.3 mm wide border, margin glabrous, flat below apex; inner phyllaries 1.1–1.4 cm, ± flat below apex. Ligules deep pink to light pinkish violet; outer ligules faintly striped deeper pink. Stigmas dark (probably dark green). Anthers polliniferous; pollen grains irregular in size. Achene grayish straw-colored brown, 4.4–4.5 × ca. 0.9 mm, smooth to very sparsely minutely tuberculata above, cone indistinct with body very gradually narrowing in beak; beak 2.5–4 mm, ± thick. Pappus white, 5–6 mm. Fl. summer. Agamosperm.

Wet alpine slopes, gravelly sites, alpine meadows; 3000–3800 m. Xinjiang (Ketmen Tau, Tian Shan) [Kazakhstan, Kyrgyzstan].

Alpine or subalpine grasslands; probably above 3000 m. Xinjiang [Kazakhstan].

**北极蒲公英** 被 ji pu gong ying zu

Plants small, delicate. Leaves usually subglabrous to glabrous; petiole unwinged or rarely narrowly winged; leaf blade undivided or shallowly to deeply lobed, indentation sparse. Outer phyllaries usually few, 8–11(–15), ± blackish green to dark green, broadly ovate to broadly lanceolate, usually less than 5–6 mm, ± appressed to loosely appressed, rarely erect, unbordered or bordered whitish or purplish, margin usually glabrous or rarely ciliate, apex usually comiculate. Ligules yellow, pale yellow, whitish, white, or pinkish. Stigmas discolored. Achene brown, olivaceous brown, blackish, reddish, straw-colored brown, gray, etc., usually 3.5–4.5 mm, not thick; body very sparsely to ± densely spinulose and/or tuberculate above, ± gradually narrowing into a conic to subconic 0.3–0.8 mm cone; beak to 5 mm, thin to slightly thickened. Pappus white.

More than 40 species: tundra of European Arctic, Alps of Europe, mountains of C Asia; one species (endemic) in China.

*Taraxacum* sect. *Arctica* has rarely been reported to occur in C Asia or China, and reports (e.g., FRPS 80(2). 1999) did not cover members of the section. However, there are several taxa described from that territory that belong to it on the basis of achene and outer phyllary characters. They are *T. junatovii* Tzvelev (SW Mongolia), *T. heptapotamicum* Schischkin and *T. atrans* Schischkin (C Tian Shan), and *T. tzvelevii* Schischkin (Tajikistan). *Taraxacum alatopetiolum*, endemic to China, also belongs to this group.

*Taraxacum altaicum* Schischkin (Sist. Zametki Mater. Gerb. Krylova Tomsk. Gosud. Univ. Kuybysheva 1949(1–2): 6. 1949), reported as a Chinese species in FRPS 80(2): 37, 1999, is a marginal member of *T. sect. Arctica* or an intermediate between *T. sect. Arctica* and *T. sect. Borealia*. It occurs in the Russian part of the Altai and perhaps might be found in northernmost Xinjiang. However, the description in FRPS does not correspond to the characters of the species, and no Chinese material of this species has been revised by us.


**翼柄蒲公英** yi bing pu gong ying

Herbs 4–6 cm tall. Petiole narrowly winged; leaf blade ± mid-green, ob lanceolate, 2.5–4.5 × 0.5–0.9 cm, ± glabrous, not divided or margin shallowly pinnatifolied to remotely dentate; lateral lobes or teeth 1 or 2 pairs, triangular, 1–2 mm, patent to subrecurved, margin entire; interlobes broad or not developed in undivided leaves, margin entire; terminal lobe triangular, margin entire, apex subacute. Scapes suffused purplish, ± equaling leaves, arachnoid and densely white arachnoid below capitulum. Capitulum ca. 2 cm wide. Involucre 5–6 mm wide, base rounded. Outer phyllaries 11–15, surface evenly blackish dark gray, ± imbricate, ovate to broadly ovate, outermost ones (2.2–)3–4.5(–5.5) × (2.5–)3–4.2 mm and 1/2–3/5 as long as inner ones, appressed, margin glabrous, apex almost flat in first capitula but black comiculate in later ones; inner phyllaries blackish, 1–1.3 cm, ± flat or comiculate below apex. Ligules golden yellow; outer ligules flat, outside striped gray; floret tube glabrous. Stigmas blackish. Achene blackish brown, 3.7–4.3 × 1–1.1 mm; body sparsely and minutely spinulose or tuberculate above, ± gradually narrowing into a conic 0.5–0.6 mm cone; beak 4–5 mm. Pappus slightly yellowish white, ca. 5 mm, Fl. summer.

- Wet alpine grasslands; ca. 3400 m. Xinjiang.

*Taraxacum alatopetiolum* is similar to *T. atrans* Schischkin but differs in having more numerous outer phyllaries.


**光果蒲公英组** guang guo pu gong ying zu

Herbs small, glabrous. Leaves undivided. Outer phyllaries blackish green, ± not imbricate, ovate-lanceolate to linear-lanceolate, erect to arcuate-patent, without a paler border, margin glabrous, apex acute and ± flat. Achene long, slender, usually 4.3–5.7 × ca. 0.8 mm; body smooth or very sparsely spinulose or tuberculate above, very gradually narrowing into a subcylindric to cylindric 0.4–0.8 mm cone; beak 5–7 mm, thin. Pappus white or yellowish white, 5–6 mm.

Two species: centered in the Asiatic Arctic and reaching mountains of S Siberia and adjacent regions; one species in China.

For differences between *Taraxacum* sect. *Gabra* and *T. sect. Atrans* see the description of the latter and comments there.

100. *Taraxacum* glabrum Candolle, Prodr. 7: 147. 1838.

**光果蒲公英** guang guo pu gong ying

Herbs 6–20 cm tall, base glabrous. Petiole purplish, to 10 cm, very narrow, glabrous; leaf blade deep green with a purplish midvein, oblong-spatulate, 2.5–8 × 0.8–1.9 cm, glabrous, undivided, margin entire or remotely sinuate-dentate, apex subacute to obtuse; teeth 1–3 pairs, apex obtuse. Scapes brownish green, ± equaling but later overtopping leaves, glabrous. Capitulum 3–4 cm wide. Involucre 7–10 mm wide, base rounded. Outer phyllaries 13–18, dark blackish green, ± not imbricate, ovate-lanceolate to narrowly lanceolate, outermost ones 5–7 × 1.9–2.6 mm and ca. 1/3 as long as inner ones, erect to patent, paler border not developed, margin glabrous, apex subacute and ± flat; inner phyllaries 1.2–1.5 cm, ± flat near apex. Ligules deep yellow; outer ligules outside faintly striped grayish green; inner ligules with dark apical teeth. Stigmas grayish green. Anthers polliniferous; pollen grains irregular in size. Achene grayish light brown, 4.8–5.5 × ca. 0.8 mm; body smooth, very gradually narrowing into subcylindric to cylindric (0.6–)0.8 × 0.3 mm cone; beak 5–7 mm. Pappus yellowish white, 5–6 mm, Fl. summer. Agamosperm. 2n = 24.

Wet mossy subalpine to alpine sites, vicinity of springs; 1600–3000 m. N Xinjiang [Kazakhstan, Mongolia, Russia (Altai)].

**Bei fang pu gong ying**

Plants medium-sized, rarely robust. Leaves usually mid-green, not thickened, sparsely arachnoid to subglabrous; petiole broadly winged to narrowly winged; leaf blade shallowly to deeply pinnatifid to pinnatisect; lobes most often patent. Scapes usually growing laterally from leaf rosette, not from center. Outer phyllaries green to blackish green, ± not imbricate, lanceolate to ovate, loosely appressed, erect or erect-patent, usually with a paler broad to narrow border, margin glabrous to sparsely ciliate, apex with a conspicuous horn or sometimes only so in later capitula. Ligules yellow or whitish. Achene grayish straw-colored brown, rarely brown or reddish, usually 4.5–0.9–1.1 mm; body shortly spinulose above, usually subabruptly narrowing into a conic to subcylin-dric 0.5–1.4 mm cone; beak usually 6–11 mm, thin. Pappus white or yellowish white.

About 80 species: mostly in circumpolar subarctic regions, many in mountains of C Asia; three species (two endemic) in China.

Several species of *Taraxacum* sect. *Borealia* were described from the vicinity of the Chinese border: *T. karakoricum* Soest from the Karakoram of Pakistan, *T. stanjukoviczii* Schischkin from Upper Badakhshan of Tajikistan, and *T. pavlovii* Orazova from SE Kazakhstan. They have not been found in the material available but their occurrence in China is not improbable.

Variation is often but not always observed in the development of horns in the outer phyllaries. The first capitula to blossom often have flat or callose outer/inferior phyllaries while later capitula have a distinct horn on the phyllaries.

1a. Ligules white .................................................................................................................................................. 103. *T. pingue*

1b. Ligules yellow.

2a. Outer phyllaries with a sharply delimited pale 0.1–0.4 mm wide border .............................................. 101. *T. roborovskyi*

2b. Outer phyllaries with a gradual transition from dark middle part into a pale 0.6–1 mm wide border .......... 102. *T. qirae*


**Gao shan pu gong ying**

Herbs 20–35 cm tall. Petiole pinkish, narrowly winged; leaf blade mid-green with a pinkish midvein, oblongate, 15–25 × 3–4 cm, subglabrous, remotely and shallowly pinnatilobed; lateral lobes 2 or 3 pairs, deltoid, patent, margin ± entire; interlobes broad and long, margin entire; terminal lobe helmet-shaped to triangular, margin entire. Scapes brownish green, overtopping leaves, sparsely arachnoid below capitulum. Capitulum 30–40 mm wide. Involucre 1–1.2 cm wide, base rounded. Outer phyllaries ca. 19, black-green with sharply delimited white border, ± not imbricate, lanceolate, outermost ones 12–14 × 2.5–3.5 mm and 3/4–4/5 as long as inner ones, ± appressed, border (0.1–)0.3–0.4 mm wide, margin ± glabrous, with a thick large horn ca. 2 mm below apex; inner phyllaries 1.3–1.6 cm, with a thick horn below apex. Ligules yellow; outer ligules flat, outside striped purplish gray; inner ligules with purple teeth. Stigmas grayish green. Anthers without pollen. Achene unknown. Fl. summer. Agamosperm.

- Mountain meadows and pastures; ca. 2500 m. W Xinjiang (Tian Shan).

*Taraxacum roborovskyi* is known from the type specimen only.


**Jian jiao pu gong ying**

Herbs 5–12 cm tall. Petiole usually suffused purplish, winged in some leaves, base arachnoid; leaf blade mid-green with a green to pinkish midvein, ± oblongate, 2–9 × 1–1.5 cm, subglabrous, shallowly pinnatifid lobed to remotely dentate; lateral lobes or teeth 3–5 pairs, broadly triangular, 2–4 mm, usually recurved, margin entire; interlobes broad or not developed in undivided dentate leaves, margin entire; terminal lobe triangular, margin entire, apex subobtuse, basal lobules or teeth ± recurved. Scapes suffused purplish, ± overtopping leaves, sparsely arachnoid to subglabrous. Capitulum 2.5–3 cm wide. Involucre 8–10 mm wide, base ± rounded. Outer phyllaries 8–11, middle part blackish with a gradual transition into a whitish to white border, not imbricate, narrowly lanceolate, outermost ones 9–14 × 2–4 mm and ca. 3/4 as long as inner ones, ± loosely appressed, border 0.6–1 mm wide, margin glabrous, apex conspicuously corniculate; inner phyllaries blackish, 1.3–1.8 cm, corniculate below apex. Ligules yellow; outer ligules flat, outside striped gray; inner ligules with gray apical teeth. Stigmas blackish. Anthers polliniferous; pollen grains irregular in size. Achene ochraceous brown when unripe but later getting darker and becoming dark brown, 4.2–4.5 × 1–1.1 mm; body spinulose above, ± abruptly narrowing into a subconic 0.8–0.9 mm cone, spinules thin, erect-patent, and acute; beak 5–6 mm. Pappus ± white, ca. 6 mm. Fl. summer. Agamosperm.

- Mountain meadows and pastures; ca. 3100 m. S Xinjiang (Qira).

*Taraxacum qirae*, a species described from the Kunlun Shan, is clearly a member of the sect. *Borealia*. Its closest relative, *T. pavlovii* Orazova, growing in C Tian Shan of Kazakhstan, differs in having substantially more numerous outer phyllaries and totally different achenes. The geographically closest member of this section, *T. karakoricum* Soest, lacks the whitish borders to the outer phyllaries and has a different leaf shape. The latter species might be found in China as it was described from the Karakoram of Pakistan, not far from the Chinese border.


**Jian jiao pu gong ying**

Herbs 5–10 cm tall. Petiole usually suffused pinkish, winged, base arachnoid; leaf blade mid-green, ± oblongate to narrowly ovate, 4.8–1–2.5 cm, sparsely arachnoid, undivided and dentate to remotely shallowly lobulate, midvein pale pur-
plish but distally green; interlobes not developed; leaf apex subobtuse to acute. Scapes brownish green, subequaling leaves, arachnoid. Capitulum 3–4 cm wide. Involucre 1.1–1.5 cm wide, base rounded. Outer phyllaries 13–19, ± blackish green with a whitish border, not imbricate, ovate-lanceolate, largest ones 5–11 × 2–3.5 mm and ca. 3/5 as long as inner ones, ± loosely appressed, border membranous and to 0.5 mm wide, margin sparsely ciliate to glabrous, apex with a conspicuous thick horn; inner phyllaries blackish, 1.3–1.9 cm, corniculate below apex. Ligules white; outer ligules flat, outside striped grayish purple. Stigmas blackish green. Anthers polliniferous; pollen grains irregular in size. Achene light straw-colored brown, 4.5–4.8 × ca. 1 mm; body subsparisely spinulose above, subapically narrowing into a thick conic 0.7–0.8 mm cone; beak 6.5–8 mm. Pappus ± white, ca. 8 mm. Fl. summer. Agamosperm.

Alpine meadows, below glaciers; 2800–3000 m. NW Xinjiang (summit area of Saur Mountains) [NE Kazakhstan].

Reports of Taraxacum pingue from Hejing Xian and Taskorgan Xian (FRPS 80(2): 46. 1999) require further study.


Plants usually small to medium-sized. Petiole usually narrowly winged; leaf blade light grayish green or glaucous green, pinnatilobed to pinnatisect; lobes not numerous, triangular, simple, margin usually entire or sparsely denticate. Involucre usually 7–10 mm wide, base subobconic to ± rounded. Outer phyllaries not numerous, usually 8–12 (–20), pale green to light glaucous green with a narrow darker middle strip and paler surface, narrowly lanceolate to ± ovate, subimbricate, appressed to erect but sometimes some arcuate, border whitish and very narrow. Ligules yellow. Achene pale straw-colored brown, ochraceous, pale reddish straw-colored brown, or grayish to whitish straw-colored brown, 3.8–5.2 × 0.7–0.9 (–1) mm; body sparsely spinulose above, usually very gradually narrowing into a subcylindric 0.8–1.4 mm cone; beak 6–8 mm, thin. Pappus white, 5–7 mm. Sexual or agamospermous.

About 20 species: centered in the Himalaya, mainly in India, Nepal, and Pakistan; five species (two endemic) in China.

The name Taraxacum indicum Handel-Mazzetti (Monogr. Taraxacum, 50. 1907) (see FRPS 80(2): 26. 1999), according to the majority of the syntypes, belongs to T. sect. Parvula. However, the heterogeneity of the syntypes and their unsatisfactory quality do not allow a safe interpretation. The name requires further detailed study and is not interpreted in the present treatment.

1a. Pollen absent .................................................................................................................................................. 105. T. dasypodum
   1b. Pollen present.
      2a. Stigmas ± yellow ...................................................................................................................................... 104. T. parvulum
      2b. Stigmas pale greenish yellow to dark green.
         3a. Outer phyllaries 11–14, 1.5–2.2 mm wide ......................................................................................... 108. T. mitalii
         3b. Outer phyllaries 16–20, 3.5–5 mm wide.
            4a. Achene grayish light brown, 4.8–5 mm; cone 1–1.2 mm .................................................................... 107. T. consanguineum
            4b. Achene pale yellowish brown to pale grayish ivory white, 3.5–4.5 mm; cone (0.6–)0.7–0.9 mm .... 106. T. vendibile

104. Taraxacum parvulum Candolle, Prodr. 7: 149. 1838.

小花蒲公英 xiao hua pu gong ying

Taraxacum himalaiacum Soest.

Herbs 5–10 cm tall, small. Petiole pale green to pinkish, arachnoid at base, narrow to narrowly ± winged; leaf blade pale grayish green, oblanceolate to broadly oblanceolate, 4–9 × 1.2–2 cm, almost glabrous, pinnatifoliate; lateral lobes in 1–3 pairs, triangular to deltoid, recurved, margin ± entire; interlobes long, margin ± entire; terminal lobe triangular-sagittate, margin entire, apex ± acute. Scapes brownish green, ± equaling leaves, arachnoid. Capitulum 1.5–2.5 cm wide. Involucre 6–8 mm wide, base broadly subconic to ± rounded. Outer phyllaries 8–10, pale grayish green, ± imbricate, ± lanceolate or narrowly so, outermost ones (4)–4.5–5.5 × (1.5–)1.8–2.3 mm and 1/3–1/2 as long as inner ones, appressed, narrow middle part blackish green, border getting paler from pale greenish near middle to whitish green near margin and 0.2–0.3 mm wide, margin subglabrous, apex bordered pinkish and ± flat; inner phyllaries 1–1.2 cm, apex ± flat. Ligules yellow; outer ligules outside faintly striped grayish pink. Stigmas yellow to pale grayish yellow. Anthers polliniferous; pollen grains ± regular in size. Achene pale brownish orange, 3.8–4.6 × 0.8–0.9 mm; body ± smooth below, subsparisely spinulose above, apically gradually narrowing into a subcylindric (0.8–1)–1.2(–1.4) mm cone, spinules short and thin; beak ca. 6 mm. Pappus white, 6–7 mm. Fl. late spring to summer. Predominantly sexual.

Grassland slopes, pastures, river terraces; 2000–4500 m. Sichuan, Xinjiang, Xizang, Yunnan [Bhutan, India, Myanmar, Nepal].


丽江蒲公英 li jiang pu gong ying

Herbs 4–7 cm tall, small, base thickened by remnants of old petioles and arachnoid. Petiole pale green, ± winged; leaf blade pale grayish green, oblanceolate to broadly oblanceolate, 4–7 × 1.2–2 cm, sparsely arachnoid to glabrescent, pinnatilobed or shallowly so; lateral lobes 2 or 3, triangular to deltoid, ± patent to recurved, margin entire; interlobes short, margin entire; terminal lobe triangular, margin entire or sometimes with a single tooth, apex subobtuse. Scapes brownish green, ± equaling leaves, arachnoid. Capitulum ca. 2 cm wide. Involucre
6–7 mm wide, base broadly subconic. Outer phyllaries 8–11, pale green, ± imbricate, ovate to ovate-lanceolate, outermost ones 3–5 × 1.8–2.1 mm and ca. 0.2 as long as inner ones, appressed, narrow middle part blackish green, border getting paler from pale greenish near middle to whitish green near margin and 0.6–0.7 mm wide, margin subglabrous, apex subobtuse, bordered pinkish, and with a blackish callousity or ± flat; inner phyllaries 10–11 × ca. 2 mm, callose near apex. Ligules yellow; outer ligules outside faintly striped grayish pink; inner ligules with black apical teeth. Stigmas yellow. Anthers without pollen. Achene (not fully ripe) deep straw-colored brown, ca. 5 mm; body almost smooth, with sparse minute tubercles or spines, ± flat; inner phyllaries 2007, ca. 0.6–0.7 mm wide, margin subglabrous, apex subobtuse, narrow middle part blackish green, border getting gradually narrowing into a subcylindric 1–1.3 mm cone; bead 3–4 mm. Pappus white, ca. 6–7 mm wide, base rounded. Outer phyllaries 16–20, lanceolate to ovate, ± densely shortly spinulose in upper 1/5–1/4, narrow, relatively densely shortly spinulose in upper 1/5–1/4, very gradually indistinctly and very gradually narrowing into a subcylindric 1–1.3 mm cone; bead 3–4 mm. Pappus white, ca. 6–7 mm wide. Fl. late spring to summer. Agamosperm.

- Dry mountain pastures; ca. 2700 m. NW Yunnan (Lijiang).

Taraxacum dasyopodium is known only from the type gathering.

106. Taraxacum vendible Kirschner & Štěpánek, sp. nov.

Type: China. Yunnan: “Zhongdian [中甸] plateau (north), Napa Hai [纳帕海], meadows 7 km to NW of pass,” 4000–4230 m, Jun 1995, A. J. Richards s.n., cultivated as JK 4070 (holotype, PRA; isotypes, MO, PE, PRA).


Herbs 12–16(–25) cm tall, ± medium-sized. Petiole pinkish to purplish, short, ± broadly winged; leaf blade grayish green and slightly suffused reddish brown, oblongate to narrowly oblongate in outline, usually 8–14 × 1.5–2.5(–4) cm, sparsely arachnoid, deep pinnatifoliate, midvein pale green and adaxially sparsely arachnoid; lateral lobes 4–9, triangular, narrowly triangular, or deltoid, 0.8–1.2 × 4–10 mm, ± patent, proximal margin straight to ± concave and ± entire or sometimes with several minute teeth, distal margin ± straight to slightly sigmoid and entire or with a few teeth; interlobes not spotted, 4–8 mm wide, margin dentate, teeth of variable length and density and with an attenuate apex; terminal lobe ± broadly triangular, distal margin ± straight and entire, apex acute or mucronate. Ligules pinkish to purplish green at base, ± equaling or sometimes exceeding leaves, ± densely floccose-arachnoid. Capitulum ca. 4 cm wide, sometimes nodding after anthesis. Involucres 1–1.1 cm wide, base rounded. Outer phyllaries 16–20, lanceolate to ovate, outermost ones 7–10 × 3.5–4.5 mm and 1/2–2/3 as long as inner ones, erect, erect-patent, or loosely appressed, middle part dark grayish green with a gradual transition into a pale whitish green ca. 1 mm wide border, apical 1/4–1/3 commonly suffused purplish, margin sparsely ciliate, apex often slightly recurved, usually flat below tip; inner phyllaries 1.2–1.4 cm, apex flat. Ligules golden yellow; outer ligules ± flat, outside striped dark grayish green, with black apical teeth; inner ligules with yellow or red apical teeth. Stigmas dark yellow to greenish. Anthers polliniferous; pollen grains regular in size. Achene very pale yellowish brown to grayish ivory white, 3.5–4.5 × 0.7–0.9 mm; body narrow, relatively densely shrilly spinulose in upper 1/5–1/4, very gradually narrowing into a relatively thick subcylindric (0.6–)0.7–0.9 mm cone, spinules ± erect; bead 8.5–10 mm. Pappus slightly yellowish white, 6–7 mm. Fl. late spring to summer. Agamosperm.
107. **Taraxacum consanguineum** Kirschner & Štěpánek, sp. nov.

*Mountain grasslands and pastures, along mountain paths; 3200–4300 m. W Sichuan, SE Xizang, NW Yunnan [Russia].*

A marginal member of *Taraxacum* sect. *Parvula*. *T. vendibile* is widely distributed in Yunnan. While the achene characters (color, narrow shape, a very gradual transition of achene body into the cone) clearly belong to this section, the outer phyllary coloration is quite unique. A comparable pattern is found only in the closely related *T. consanguineum*.


*Mountain grasslands; ca. 3900 m. SE Xizang.*

**Taraxacum consanguineum** differs from the closely related *T. vendibile* primarily in the color and size of achenes and cone length, in the leaf coloration (a dark spot on the interlobes), longer outer phyllaries, and darker color of stigmas.


*Pyrrhopappus sect. Piesis* Candolle, Prodr. 7: 144. 1838.

*3900 m, 22 Jun 1999, R. Businský & L. Businská s.n.*

**Paratype:** China. Xizang: *ibidem*, cultivated as JS 7434 (holotype, PRA; isotypes, MO, PE, PRA).

**A Taraxaco vendibi** Kirschner & Štěpánek *interlobis foliorum obscure fusco-violaceis, phyllariis involucralibus externis longioribus, stigmatibus obscurioribus et achenis longioribus fuscogriseisque differt.*

**Herbs 12–20 cm tall, ± medium-sized. Petiole pinkish to purplish, short, ± broadly winged; leaf blade deep grayish green and slightly suffused reddish brown, oblanceolate to narrowly oblanceolate in outline, usually 8–14 × 1.5–3 cm, sparsely arachnoid, deeply pinnatilobed, midvein pinkish and adaxially sparsely arachnoid; lateral lobes 4–9, ± triangular, ± patent, distal margin ± straight to slightly sigmoid and entire or with a few teeth, proximal margin straight to ± concave and ± entire but sometimes with several minute teeth; interlobes distinctly colored brownish purple (spot often also covering bases of lateral lobes), broad, margin dentate to lobulate, teeth and lobules of variable length and density and with an attenuate apex; terminal lobe ± broadly triangular to 3-partite, distal margin ± entire, apex acute or mucronate. Scapes pinkish to purplish green at base, ± equaling leaves, ± densely floccose-arachnoid. Capitalium 4.5–4 cm wide. Involucre 1–1.2 cm wide, base rounded. Outer phyllaries 16–20, lanceolate to ovate, outermost ones 9–11 × 3.5–5 mm and 1/2–2/3 as long as inner ones, ± erect-patent, middle part dark grayish green with a gradual transition into a pale whitish green ca. 1 mm wide border, apical 1/4–1/3, usually suffused purplish, margin sparsely ciliate, apex often slightly recurved and usually flat tip; inner phyllaries 1.2–1.4 cm, apex flat. Ligules golden yellow; outer ligules ± flat, outside striped dark grayish, with black apical teeth; inner ligules with reddish apical teeth. Stigmas pale greenish to greenish, abaxially blackish pilose. Anthers polliniferous; pollen grains regular in size. Achene grayish brown, 4.8–5 × 1–1.1 mm; body narrow, shortly spinulose in upper ca. 1/4, very gradually narrowing into an almost cylindric 1–1.2 mm cone, spinules ± erect; beak 1–1.2 cm. Pappus dirty white, ca. 7 mm. Fl. late spring to summer. Agamosperm.*

**Herbs 8–15 cm tall. Petiole usually purplish to pinkish, arachnoid at base, narrow to narrowly winged; leaf blade grayish green, sometimes suffused brownish purple, ± oblanco-eolate, 7–11(–13) × 1.3–2 cm, arachnoid but later sparsely so, pinnatisect or less often pinnatilobated, midvein light green; lateral lobes 2–4 pairs, triangular to deltoid, recurved, proximal margin straight and ± entire, distal margin usually denticulate and straight or convex but in inner leaves often concave, apex acute; interlobes short, margin often raised and with a few teeth; terminal lobe triangular-sagittate but sometimes hastate, to 3 cm, margin ± entire or often with incisions or lobules, apex ± acute. Scapes brownish purple, subequalling leaves, arachnoid. Capitalium 2.5–3.5 cm wide. Involucres 8–9 mm wide, base ± rounded. Outer phyllaries 11–14, light grayish green, subimbricate, ± lanceolate or ovate-lanceolate, outermost ones 6–7 × 1.5–2.2 mm and 1/2–3/5 as long as inner ones, appressed, some erect-patent, narrow middle part blackish green, border getting paler from pale greenish near middle to whitish green near margin and 0.1–0.3 mm wide, margin subglabrous, apex pinkish and ± callose; inner phyllaries 1.2–1.5 cm, apex ± callose. Ligules yellow; outer ligules outside striped blackish pink, inner ligules with ± yellow apical teeth. Stigmas yellowish green but dark green when dry. Anthers polliniferous; pollen grains irregular in size. Achene light grayish straw-colored brown, 3.9–4.3 × 0.9–1 mm; body ± smooth below, ± densely spinulose above, apically subgradually narrowing into a subcylindric to subconic 0.9–1.1 mm cone, spinules thin and ± erect; beak ca. 7 mm. Pappus white, ca. 5 mm. Fl. late spring to summer. Agamosperm. 2n = 24.*

**Mountain grasslands and pastures, along paths; 3000–4300 m. S Xizang [India, Myanmar, Nepal].**


*窄苞蒲公英组* zhai bao pu gong ying zu

**Pyrrhopappus sect. Piesis** Candolle, Prodr. 7: 144. 1838.

*Involucres usually narrow at base, 4–6 mm wide, rarely 9–10 mm wide. Outer phyllaries linear to linear-lanceolate, usually appressed to erect, border usually pale greenish or pinkish, narrow, and membranous, apex callose to conspicuously coriocolate.*
Achene only sparsely and shortly spinulose above, gradually to (rarely) subabruptly narrowing into a subcylindric 0.4–1.9 mm cone; beak well developed, 2–7.5 mm. Pappus dirty yellowish to pale pinkish brown. Only sexual, predominantly diploid species.

About eight species: from W Europe to C Asia, Russia (SW Siberia), and China, with highest diversity centered in Turkey and the Caucasus; one species in China.


Kepai Pengongying zhai bao pu gong ying


Herbs 8–17 cm tall. Leaves prostrate to erect-patent, subglabrous; petiole pale green, rarely suffused pinkish, winged; leaf blade mid-green to pale yellowish green, narrowly oblancoeleate to narrowly elliptic, 8–18 × 1.5–2.5 cm, almost undivided, dentate, or pinnatifid; lateral lobes 4–6, usually patent, often slightly forward pointing, rarely triangular and downward pointing, distal margin ± convex and with 1( or 2) prominent tooth, apex acuminate; interlobes usually short to indistinct or less often narrowly triangular-longate, margin usually entire; terminal lobe triangular to elongate, 1–2 × 0.8–1 cm, margin entire or sparsely dentate, apex acuminate to subobtuse. Scapes about equaling leaves, sparsely arachnoid, rarely with bractlets below capitulum. Capitulum 1–2 cm wide. Involucral almost cylindrical, 5–7 mm wide, base narrowly rounded to obconic. Outer phyllaries 14–21, pale green to pale pinkish brown, linear to linear-lanceolate, (4–)5–6.5 × (0.6–)1–1.6(–2) mm, appressed, with an indistinct pale 0.2–0.4 mm wide border, slightly callose to minutely coriuncate below apex. Ligules pale yellow; outer ligules subcanaliculate, outside striped reddish or pinkish gray; inner ligules canaliculate, with yellow or reddish apical teeth. Stigmas yellow, dirty yellow, or pale green. Anthers polliniferous; pollen grains regular in size. Achene pale grayish straw-colored brown, (4.5–)5–5.5(–6.5) mm; body sparsely to densely and usually shortly spinulose above, gradually to subabruptly narrowing into a subcylindric 1.1–1.4(–1.7) mm cone; beak 4.5–5 mm. Pappus pale pinkish brown, 5.5–6.5 mm. Fl. Jul–Oct. Sexual. 2n = 16.

Wet saline meadows and pastures; 400–2000 m. Ningxia, Xinjiang [Kazakhstan, Mongolia, Russia].

The big gap between the common occurrence of Taraxacum bessarabicum in Xinjiang and an isolated locality in Ningxia might be a result of imperfect exploration of the regions between them. In particular, the species is to be looked for in W Nei Mongol.


紫果公英组 zi guo pu gong ying zu

Plants usually medium-sized, base without a tunic or with a few old petioles. Petiole unwinged or winged; leaf blade pinnatifid; lateral lobes few to numerous, usually triangular to narrow, margin often dentate or lobulate. Capitulum usually 3–4 cm wide. Outer phyllaries usually 12–20, lanceolate to broadly ovate, long, often imbricate, appressed, loosely appressed, or less often arcuate-recurved, usually distinctly broadly or narrowly bordered, apex usually coriuncate or horned. Ligules yellow; floret tube glabrous. Achene red, reddish brown, brown, castaneous, or straw-colored brown, usually 4.3–5.5 mm; body usually densely spinulose above, usually subabruptly narrowing into a distinct cylindric 1–1.5 mm cone, spinules long and thin; beak usually 0.8–1.3 cm. Pappus ± white.

About 40 species: centered in the Mediterranean region and Iran; one species (endemic) in China.

The name Taraxacum tianschanicum Pavlov (Vestn. Akad. Nauk Kazakhsk. S.S.R. 8: 30. 1950) was published on the basis of the material from the southwesternmost Tian Shan and probably belongs to T. sect. Erythrocarpa. It was reported to occur in China (FRPS 80(2): 64. 1999). We failed to find any specimen of this taxon from China. Also, geographically the occurrence of T. tianschanicum in China is rather improbable.

110. Taraxacum russicum Kirschn. & Stepánek, sp. nov.

红蒲公英 hong pu gong ying


Planta egeumpermeae, medioeirter altae, foliis pinnatisectis, immaculatissimis, lobo terminali parvo, triangulares vel triglobose, lobis lateralisibus 5 ad 7 utrinque, ± patentibus, triangul...
base; interlobes with purple-brown spots, to 5 mm, sparsely dentate, teeth large; terminal lobe ± triangular to 3-partite, terminal and basal segments narrow, often lingulate, apex acute. Scapes pinkish green, ± equaling leaves, arachnoid. Capitulum 2.5–3 cm wide. Involucre 1–1.1 cm wide, base rounded. Outer phyllaries 15–19, dark green and slightly pruinose, lanceolate to ovate, 8–10 × 3.4–4.5 mm, erect, ± patent, or arcuate-recurved, with a evident whitish (0.1–0.2–0.4 mm margin, margin sparsely ciliate, apex usually purplish and usually coriaceous; inner phyllaries 1.2–1.4 cm, often coriaceous near apex. Ligules (paler) yellow; outer ligules subcanaliculate, outside striped dark grayish; inner ligules with yellow to reddish apical teeth. Stigmas grayish green. Anthers without pollen. Achene cinnamon brown, 4.2–4.5 × 0.8–0.9 mm; body narrow, relatively densely shortly spinulose-squamulose above, very gradually narrowing into a cylindric 1–1.2 mm cone; beak 8–9.5 mm. Pappus slightly yellowish white, ca. 5 mm. Fl. late spring. Agamosperm.

- Ruderal sites, dry grasslands; 1500–2000 m. Guizhou, Yunnan.

*Taraxacum rassum* is probably native to China. The relatively robust growth; long, corniculate, and distinctly bordered outer phyllaries; and relatively large achenes point to *T.* sect. *Erythrocarpa.* The species is characterized also by cinnamon brown achenes, absence of pollen, deep grayish green stigmas, spotted interlobes, and arachnoid leaves.


香花蒲公英组 xiang hua pu gong ying zu

Plant base with remnants of brownish dry petioles. Petiole narrow, unwinged; leaf blade deeply lobed, with lobes most often patent. Scapes densely arachnoid. Involucre base rounded to slightly truncate. Outer phyllaries 9–12, ± imbricate, orbicular-ovate to broadly ovate, mostly 5–6(–7) mm, appressed, with broad paler margin, apex usually coriaceous. Achene 4.5–5 mm; body grayish straw-colored or red, densely spinulose above, very gradually narrowing into a conic-subcylindric 0.4–0.9 mm cone, spinules short and thin; beak 3–6 mm, slightly thickened. Pappus white [or whitish yellow], 5–6 mm. Fl. early spring. Agamosperm.

- Ruderal sites, dry grasslands; 3000–3300 m. Xinjiang (Tian Shan).

The occurrence of members of this section is imperfectly explored due to early vernal flowering and scarce material in herbarium collections. For the time being, a single species is known from China. Several distinct taxa, however, are known to occur in the close vicinity of the Chinese border in Kyrgyzstan and may also be found in China (Kirschner & Štěpánek, Preslia 77: 263–276. 2005). *Taraxacum sumneviczii* Schischkin (Sist. Zanetki Mater. Gerb. Krylova Tomsk. Gosud. Univ. Kuybysheva 1949(1–2): 8. 1949) was reported to occur in China (FRPS 80(2): 64. 1999) but the species was not present in the material studied by us. In all likelihood, the records are referable to *T. pseudosumneviczii*.

The name *Taraxacum wutaishanense* Kitamura (Acta Phytotax. Geobot. 40: 145. 1989), in all likelihood, belongs to *T.* sect. *Suavia.* However, the original material consists of a single plantlet without achenes, and the interpretation of the name is uncertain. The plant may also belong to *T.* sect. *Stenoloba* or *T.* sect. *Dissecta.*

Members of *Taraxacum* sect. *Suavia* are similar to those of *T.* sect. *Dissecta* but have longer achenes with a very gradual transition into a short conic-subcylindric cone, short beak, and subobicular outer phyllaries.

**111. ***Taraxacum pseudosumneviczii* Kirschner & Štěpánek, sp. nov.

假紫果蒲公英 jia zi guo pu gong ying

Type: China. Xinjiang: “Tian Shan [天山], 43°02′16″N, 86°47′16″E, alpine meadows with *Stipa purpurea*” [Heijing Xian 和静县], 3255 m, 4 Oct 2003, *P*. Sekerka 03/9, cultivated as JK 4950 (holotype, PRA; isotype, PRA).

*A Taraxaco sumneviczii* Schischkin, *specie valde simili, phyllariis involucralibus minoribus, numerosis, late ovatis usque ovato-lanceolatis, calathis viis opertis, floribus tubulosis, stigmatibus obscurotoribus et pyramide espumulosa bene distintu*.

Herbs 6–10 cm tall, delicate, base arachnoid and with a tunic. Petiole purplish, 1–2 cm, ± unwinged; leaf blade pale green with a pale greenish midvein, ± narrowly oblanceolate in outline, 4–7 × 0.8–1.2 cm, sparsely to densely arachnoid, deeply pinnatisect; lateral lobes 6–8, ± linear, 4–5 × 1–1.5 mm, ± patent or sometimes slightly curved upward, proximal margin straight to concave and entire, distal margin straight to ± sigmoid and entire or with a single tooth near base; interlobes ± short and narrow, margin entire or very sparsely dentate; terminal lobe ± narrowly triangular, 3-partite, basal segments narrow, 3–4 × ca. 1 mm, and patent, terminal segment narrowly spatulate, 8–10 × 1–2 mm, and apex acute. Scapes green but base pinkish green, ± equaling leaves, ± densely arachnoid. Capitulum 1–1.5 cm wide, remaining unopened. Involucre 6–7 mm wide, base rounded. Outer phyllaries 11–15, dark green, broadly ovate to ovate-lanceolate, outermost ones 3.5–5 × 2–2.5 mm and ca. 1/3 as long as inner ones, loosely appressed, dark middle part with a gradual transition into a paler to whitish 0.2–0.5 mm wide border, margin sometimes sparsely denticulate and glabrous or sparsely ciliate near apex, apex ± flat or dark callose; inner phyllaries 1.2–1.3 cm, apex ± flat. Ligules ± yellow, short; outer ligules ± tubular, outside striped grayish red; inner ligules usually with yellow apical teeth. Stigmas pale grayish green. Anthers without pollen. Achene reddish brown, 4.4–5.1 × 1–1.2 mm; body densely shortly spinulose in upper ca. 1/3, very gradually narrowing into a thick subconic 0.6–1 mm cone, spinules thin and ± erect; beak ca. 4 mm, ± thick. Pappus white, 5–5.5 mm. Fl. spring. Agamosperm.

- Mountain steppe dry grasslands; 3000–3300 m. Xinjiang (Tian Shan).

Early vernal small plants, base with a tunic. Petiole unwinged; leaf blade arachnoid, deeply lobed, lateral lobes patent or recurved. Scapes arachnoid. Involucres with rounded base, usually 7–10 mm wide. Phyllaries with apex flat and not corniculate or rarely slightly callose; outer phyllaries 10–16, imbricate or not so, appressed to patent, with a distinct paler border, margin ciliate. Florets yellow; stigma discolored. Outer and inner phyllaries flat, without corniculate at apex, rarely slightly callose. Achene grayish straw-colored brown, brown, or red, densely spinulose above, 3–4.4 × 0.7–0.9 mm; body subabruptly or ± abruptly narrowing into a cylindrical to conic-subcylindric 0.5–0.9 mm cone; beak 6–9 mm. Pappus white.

About ten species: widespread from E Kazakhstan, S Siberia, and Mongolia to NW China; one species (endemic) in China.


Plants usually small, base with a tunic. Petiole unwinged; leaf blade arachnoid, deeply pinnatifid; midrib green to pinkish and ± glabrous; lateral lobes 4 or 5 pairs, narrowly triangular to linear-triangular, ca. 5 × 2 mm, patent to subrecurved, distal margin convex or straight and entire or sparsely dentate; terminal lobes narrow, margin usually denticulate; terminal lobe narrowly triangular to 3-partite, margin entire. Scapes brownish or purplish green, overtopping leaves, sparsely arachnoid. Capitulum to 2.5 cm wide. Involucre 7–8 mm wide, base rounded. Outer phyllaries 10–13, imbricate, ovate to broadly ovate, outermost ones (3–)5–6 × 2.2–4 mm and 1/3–1/2 as long as inner ones, appressed, margin ciliate, apex ± flat; inner phyllaries 1–1.4 cm, apex blackish callose or flat. Ligules yellow; outer ligules flat, striped purplish gray outside; inner ligules with yellow or gray apical teeth. Stigmas light grayish green. Anthers without pollen. Achene pure brown or castaneous brown, 3.2–3.8 × 0.7–0.8 mm; body subdensely spinulose in upper ca. 1/4, subabruptly narrowing into a ± cylindrical 0.6–0.8 mm cone; beak ca. 6 mm. Pappus white, 4–5 mm. Fl. spring. Agamosperm.

- Dry gravelly slopes, dry grasslands; 500–1000 m. Xinjiang (Tian Shan).

Taraxacum dissectum (Ledebour) Ledebour and T. compactum Schischkin differ from T. spadiceum in fruit color and in having broadly bordered outer phyllaries. The former two species and T. collinum and T. compactum have dis-

瑞典蒲公英 rui dian pu gong ying

Herbs 10–20 cm tall. Petiole purplish, ± unwinged; leaf blade deep green, narrowly elliptic, usually 5–10 × 1.5–2.5 cm, sparsely arachnoid to subglabrous, deeply pinnatisect, midvein green or adaxially purplish and sparsely arachnoid; lateral lobes 3–5, triangular to narrowly triangular in outer leaves but in middle leaves narrowly triangular to linear-triangular, ± patent to slightly recurved, proximal margin ± entire, distal margin sigmoid to straight and entire or with several teeth or lobules near base; interlobes often with purplish brown margin, narrow, margin dentate and lobulate; terminal lobe ± triangular in outer leaves but 3-partite in middle ones, terminal segment elongated, narrow, often lingulate, with a few teeth or lobules at base, and apex acute. Scapes pinkish green but later purplish, ± equaling leaves, arachnoid. Capitulum 2.5–3 cm wide. Involucre 7–9 mm wide, base ± rounded. Outer phyllaries 10–15, lanceolate to narrowly so, 6.5–9 × 1–3.5 mm, ± patent to almost reflexed, abaxially deep green, adaxially pale glaucous green, border adaxially ± evident, whitish, and 0.1–0.2 mm wide, margin sparsely ciliate, apex usually corniculate; inner phyllaries 1.2–1.5 cm, often corniculate near apex. Ligules yellow; outer ligules flat, outside striped dark grayish green. Stigmas yellowish green. Anthers polliniferous; pollen grains irregular in size. Achenes light brown to slightly reddish brown, 3.4–3.6 × 0.8–0.9 mm; body narrow, subdensely shortly spinulose above, subgradually narrowing into a thin cylindric 0.9–1 mm cone; beak 7–8 mm. Pappus slightly yellowish white, ca. 5 mm. Fl. spring. Agamosperm. $2n = 24$.

Park grasslands, ruderal grasslands; 400–500 m. Liaoning [native to Europe].

This species is introduced from Europe, where the Taraxacum scanicum group consists of several closely related taxa (for review, see Vašut et al., Preslia 77: 197–210. 2005). The Chinese plant is in all respects, particularly in leaf shape, outer phyllaries, floret characters, and size and shape of achenes, almost identical with T. scanicum s.s., with the exception of the almost brown achenes (the European T. scanicum has achenes more reddish brown).

23. Taraxacum sect. Taraxacum

西洋蒲公英组 xi yang pu gong ying zu

Taraxacum officinale F. H. Wiggers, s.l.

Plants medium-sized or robust. Leaves numerous; petiole unwinged or winged; leaf blade usually broad (3–6 cm), deeply lobed to pinnatisect; lateral lobes variously triangular or deltoid, margin usually dentate or lobulate; interlobes evident, often spotted or bordered tan or brownish purple, margin usually dentate. Capitulum 3–7 cm wide. Involucre usually more than 1 cm wide, base rounded or flat. Outer phyllaries (12–)15–25(–28), usually mid-green to deep green and sometimes pruinose, variously arranged, broadly linear, linear-lanceolate, or less often lanceolate, usually 12–16 × 2.5–3.5 mm, usually irregularly patent to reflexed, unbordered or with inconspicuous narrow paler borders, apex usually flat but not infrequently callose or sometimes minutely corniculate. Ligules yellow; floret tube glabrous or sparsely arachnoid with variously curved soft thin hairs. Achenes grayish straw-colored brown or light olivaceous brown, usually 3–4.5 mm; body densely spinulose in upper 1/4–1/3, ± abruptly narrowing into a conic to subcylindric 0.2–0.9 mm cone; beak usually 0.9–1.3 cm, thin. Pappus white to dirty white, usually 6–7 mm. Sexual or agamospermous.

Numerous species: mostly known from Europe; three (or perhaps more) species (one endemic, two introduced) in China.

Taraxacum sect. Taraxacum in Europe has over 1,000 recognized agamospermous species, but in other continents the section is fragmentary. China has few agamospermous species in this section. Several species described from China undoubtedly belong to T. officinale, and another couple of agamospermous species were identified as T. oblongatum and T. rhodopodium. The low quality of herbarium material and lack of specialized collections do not allow any detailed taxonomic analysis. Taraxacum sect. Taraxacum is represented in China by several species, probably mostly introduced, and their taxonomy requires further study.

The name Taraxacum officinale is generally used to cover the diversity of this section. Until recently, the effective lectotypification restricted the usage of this name to what is most often called T. sect. Croceae M. P. Christiansen, a northern and alpine section. A corrected typification, returning the name to the most common usage (in the sense of T. sect. Ruderalia) was published recently (Kirschner & Štěpánek, Taxon 60: 219. 2011). From now on, the name T. officinale in its broad sense may be used for what is here treated as T. sect. Taraxacum (T. sect. Ruderalia), and the older records under T. officinale usually belong to this section, which is widespread in China.

The type specimen of Taraxacum brassicofolium Kitagawa (Rep. Inst. Sci. Res. Manchoukuo 2: 308. 1938) was not traced. From the description it is obvious that the type plant was an enormously robust “bloated” specimen. The taxon most probably belongs to T. sect. Taraxacum (the only feature not in full accordance with this assumption is the minute corniculation of outer phyllaries, but taxa in T. sect. Taraxacum do not infrequently have this trait). The whitish membranous bractlets on the receptacle margin are treated as a monstrosity. Because of the lack of material and insufficient original description, we do not include the taxon in this treatment.

As the following three species represent a minor fragment of totally unexplored morphological variation and taxonomic complexity of the section in China, we refrain from providing the identifying key.


椭圆蒲公英 tuo yuan pu gong ying

Herbs 10–25 cm tall. Petiole pinkish purple, winged; leaf blade deep green with a light green midvein sometimes pinkish near base, ± oblong-oblate lanceolate, 7–18 × 3–4 cm, sparsely arachnoid to subglabrous, ± pinnatisect; lateral lobes 3–5 pairs,
± triangular, relatively broad, usually hamate-recurved, distal margin convex and usually entire or seldom denticate; interlobes short but proximal ones longer, margin entire or denticate, often with a raised dark border; terminal lobe ± helmet-shaped or almost rounded, base often cordate, proximal margin ± straight or sigmoid, distal margin convex and ± entire, apex subobtuse to obtuse and mucronate. Scape light green but later brownish purple, ± arachnoid. Capitulum 3.5–5 cm wide. Involucre base ± rounded. Outer phyllaries 14–18, regularly arranged, linear-lanceolate to lanceolate, (10−)11–13(−14) × 2.3–3.5 mm, arcuate-recurved, abaxially dark green and often suffused purplish brown, adaxially grayish green, ± unbordered. Ligules deep yellow; outer ligules flat, outside striped light grayish brownish purple. Stigmas dark grayish green to almost blackish. Anthers polliniferous; pollen grains variable in size. Achene grayish straw-colored brown, (3.4–)3.8–4.3 mm, ± densely spinulose in upper ca. 1/4, ± abruptly narrowing into a ± conic 0.5–0.6 mm cone; beak 1–1.1 cm. Pappus ± white, ca. 6 mm. Fl. early summer.

Lawns, ruderal sites. Yunnan [native to Europe].


阴山蒲公英  yin shan pu gong ying

Herbs to 35 cm tall, robust. Petiole probably pinkish, winged; leaf blade deep green or ± glaucous green, ± broadly oblanceolate, 10–25 × 2.5–4 cm, ± sparsely arachnoid, pinnatilobed to pinnatisect, midvein purplish and arachnoid; lateral lobes usually 4 or 5, ± narrowly triangular, from broad base abruptly narrowing into a linear-triangular distal part, ± patent to pointing upward, proximal margin convex and usually denticate, distal margin usually ± straight and usually entire or rarely denticate, distal margin usually ± straight or convex and entire or ± denticate, apex acute; interlobes short, broad, margin denticate or entire; terminal lobe triangular to helmet-shaped, margin usually entire or with a single incision, apex subacute. Scape brownish green, overtopping leaves, arachnoid. Capitulum ca. 3 cm wide. Involucre 1.3–1.5 cm wide, base ± rounded. Outer phyllaries 13–16, lanceolate to broadly lanceolate, 13–14 × 2–3 mm, recurved to reflexed, abaxially dark green, adaxially suffused brownish purple, margin ± glabrous, apex flat; inner phyllaries 1.5–1.8 cm, neighboring pairs often fused and then very broad. Ligules deep yellow; outer ligules flat, outside striped grayish green. Stigmas yellowish green. Anthers polliniferous; pollen grains irregular in size. Achene grayish straw-colored brown, 3.2–3.5 mm; body ± densely spinulose above, ± abruptly narrowing into a ± conic 0.5–0.6 mm cone, spinules thin and acute; beak 9.5–10.5 mm. Pappus ± white, ca. 7 mm. Fl. late spring. 2n = 24.

Mountain grasslands, along paths; 3600–3700 m. Naturalized in Yunnan [native to (or at least described from) Europe].


假苦菜属  jia ku cai shu

Shi Zhu (石铸 Shih Chu); Norbert Kilian


Herbs, perennial, usually rather delicate, with a slender taproot and often with shoot-bearing lateral roots. Stems rather low, slender, often branched from base. Leaves in basal rosette or along stem, usually small, with orbicular to obovate and spatulate blade attenuate into a long petiole-like base, glabrous. Synflorescence mostly with rather few capitula. Capitula erect, with 5–15 florets. Involucre narrowly cylindric. Phyllaries in few series, glabrous or setulose or arachnoid hairy; outer phyllaries usually less than 1/4, rarely to 1/3, as long as inner ones; inner phyllaries linear-lanceolate, equal. Receptacle naked. Florets yellow or more rarely pale purplish red. Achene usually pale brown, slenderly cylindric to slenderly fusiform, with 10 thin equal ribs, apically truncate, attenuate, or shortly beaked. Pappus white, of scabrid bristles, usually caducous or persistent.

About 11 species: C, NE, and SW Asia, North America; six species (one endemic) in China.

Treatment of Askellia (with a basic chromosome number of x = 7) as a separate genus instead of as a section of Crepis (C. sect. Ixeridopsis) has been corroborated recently both by Sennikov and I. D. Illarionova (Komarova 5: 57–115. 2008), based, in particular, on carpological investigations,
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and Enke and Gemeinholzer (Taxon 57: 756–758. 2008), based on molecular phylogenetic analyses, yet with uncertain systematic position. More recently, J. W. Zhang et al. (in prep.) revealed in their molecular phylogenetic analyses of subtribe Crepidinae that Askellia is part of a well-supported clade including Ixeridium, Ixeris, and Taraxacum and sister to a subclade including Ixeris and Ixeridium.


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Herbs 3–4[–10] cm tall, perennial, glabrous, glaucescent. Roots and subterranean shoots often branched and slender. Stem delicate, erect or sometimes procumbent, branched from base or middle, leafy. Basal and lower stem leaves with a 1–1.5 cm petiole; leaf blade elliptic to narrowly elliptic-ovate, 7–10 × ca. 6 mm, base cuneate, margin entire or sinuate-dentate, apex acute. Upper stem leaves similar to lower stem leaves but narrowly elliptic, smaller, sometimes tinged with purple, margin entire. Synchronocence corymbiform, with few to several capitula. Capitula with 10–12 florets; peduncle filiform, 0.5–2 cm. involucre narrowly cylindric, 6–10 × 3–4 mm. Phyllaries abaxially glabrous but ciliate at apex; outer phyllaries green, ovate to lanceolate, longest 2–2.5 mm, margin thin and scarious, apex obtuse to acute; inner phyllaries 8, apex acute. Florets pale purple. Corolla 1–2.6[–3.5] × 0.4–1[–1.7] cm, base cuneate, margin entire, apex acute to rounded; lateral lobes (if present) (1–)3–5-paired, opposite or alternate, elliptic, linear, or toothlike, rarely pinnately divided. Middle and upper stem leaves similar to lower stem leaves but sessile or shortly petiolate and linear-lanceolate to narrowly linear, upward on stem gradually smaller. Synchronocence corymbiform and sometimes very densely so, with few to several capitula. Capitula with 9–11 florets; peduncle filiform, 2–8 × 0.2–2 cm, shallowly pinnatisect to pinnatifid to pinnatisect or more rarely univittate, base attenuate into a 0.5–1.5 cm petiole-like portion, base narrowly cuneate, margin entire, apex acute to obtuse; inner phyllaries with a scarious margin, apex obtuse to acute. Florets yellow. Corolla 0.9–1.1 cm. Anther tube 2–2.5 mm. Achene pale yellow, fusiform, 4–6 mm, apex attenuate. Pappus 4–6 mm. Fl. and fr. Jun–Oct. 2n = 14*.

Herbs 3–10 cm tall, perennial, glabrous. Stem erect, branched apically, base with residue of old petioles. Lower and middle stem leaves elliptic to oblanccolate, 5–9 × 0.5–1.1 cm including a 3–5.5 cm petiole, base narrowly cuneate, margin sinuate-dentate, apex rounded. Upper stem leaves sessile, linear to lanceolate, base cuneate, margin entire or subentire; uppermost leaves bractlike. Synchronocence corymbiform, with 8–12 capitula. Capitula with ca. 11 florets; peduncle shorter than involucre. Involucre narrowly cylindric, ca. 1.1 cm. Phyllaries abaxially glabrous; outer phyllaries narrowly ovate to lanceolate, longest ca. 2 mm, apex acute; inner phyllaries with a scarious margin, apex obtuse to acute. Florets yellow. Corolla 1–1.4 cm. Anther tube 3–4 mm. Achene brown, fusiform, ca. 6 mm. Pappus ca. 7 mm. Fl. and fr. Jun–Aug.

Gravelly areas on floodplains; 3100–4000 m. Xinjiang, Xizang [Tajikistan].


Herbs to 17 cm tall, perennial, glabrous. Stem erect, branched apically, base with residue of old petioles. Lower and middle stem leaves elliptic to oblanccolate, 5–9 × 0.5–1.1 cm including a 3–5.5 cm petiole, base narrowly cuneate, margin sinuate-dentate, apex rounded. Upper stem leaves sessile, linear to lanceolate, base cuneate, margin entire or subentire; uppermost leaves bractlike. Synchronocence corymbiform, with 8–12 capitula. Capitula with ca. 11 florets; peduncle shorter than involucre. Involucre narrowly cylindric, ca. 1.1 cm. Phyllaries abaxially glabrous; outer phyllaries narrowly ovate to lanceolate, longest ca. 2 mm, apex acute; inner phyllaries with a scarious margin, apex obtuse to acute. Florets yellow. Corolla 1–1.4 cm. Anther tube 3–4 mm. Achene brown, fusiform, ca. 6 mm. Pappus ca. 7 mm. Fl. and fr. Jun–Aug.

Gravelly areas on floodplains; 3100–4000 m. Xinjiang, Xizang [Tajikistan].


弯茎假苦菜 wan jing jia ku cai


Herbs 3–30 cm tall, perennial, glaucescent, glabrous. Roots and subterranean shoots often branched and slender. Caudex sometimes branched in older plants, with rosette leaves often well developed. Stem repeatedly divaricate and often intricately branched from base; branches few to numerous, usually rather delicate, ascending. Basal and lower stem leaves extremely variable, oblanccolate, ovate, elliptic, lanceolate, or more rarely linear, 2–8 × 0.2–2 cm, shallowly pinnatisect to pinnatifid to pinnatisect or more rarely univittate, base attenuate into a 0.5–1.5 cm petiole-like portion, margin entire to sinuate-dentate, apex acute to rounded; lateral lobes (if present) (1–)3–5-paired, opposite or alternate, elliptic, linear, or toothlike, rarely pinnately divided. Middle and upper stem leaves similar to lower stem leaves but sessile or shortly petiolate and linear-lanceolate to narrowly linear, upward on stem gradually smaller. Synchronocence of each branch corymbiform and sometimes very densely so, with few to several capitula. Capitula with 9–13 florets; peduncle filiform, extremely variable in length and ranging from much longer than involucre to almost absent. Involucre narrowly cylindric, 6–10 × 2–3 mm. Phyllaries green, abaxially glabrous; outer phyllaries ovate to ovate-lanceolate, longest usually ca. 2 mm, apex acute to obtuse; inner phyllaries 8, margin narrow and scarious, apex acute to obtuse. Florets yellow. Corolla 0.9–1.1 cm. Anther tube 3–4 mm. Achene pale yellow, fusiform, 4–6 mm, apex attenuate. Pappus 4–6 mm. Fl. and fr. Jun–Oct. 2n = 14*.

Gravelly areas on floodplains and bases of slopes, stream banks; 4600–4700 m. Xinjiang, Xizang [Kazakhstan, Mongolia, E Russia; North America].


长苞假苦菜 chang bao jia ku cai

Askellia flexuosa is the most widespread and frequent species of the genus in China, with a considerable ecological amplitude. The species is superficially similar to Crepidastrum akagii, but the latter differs by its blackish achene, with acute antorae papillae and less attenuate apex, and its somewhat thicker involucre, with outer phyllaries somewhat longer.

Askellia melanthera (= Crepis melanthera), only known from the type (not seen) collected in a schoolyard of the city of Ürümqi, Xinjiang, poorly described and diagnosed by blackish anthers and style branches, may perhaps otherwise match A. flexuosa and is tentatively included here.

### 73. Ixeridium (A. Gray) Tzvelev, Fl. URSS 29: 388. 1964.

小苦荬属 xiao ku mai shu

Shi Zhu (石铸 Shih Chu); Norbert Kilián


Herbs, perennial, often rosulate. Stem ascending-erect to erect, branched from base or higher up. Synflorescence usually corymbose or paniculately corymbose, with few to many capitula. Capitula with 5–11(–18?) florets. Involucre narrowly cylindric. Phyllaries in few series, margin narrow and scarios; outer phyllaries few, very short (at most ca. 2 mm, usually less), ± unequal; inner phyllaries 5 or (7 or)8, linear-lanceolate, equal. Receptacle naked. Florets some shade of yellow [or rarely white]. Achenes pale brown to brown, usually ± subfusiform, subcompressed, with 5 slender main ribs alternating usually with 1 (only exceptionally with 0 or 2) narrower to subequal secondary ribs, space between ribs widely U-shaped, apically often with antorae acute papillae, apex attenuate into a short slender beak. Pappus yellowish to straw-colored or rarely ?white, of scabrid bristles.

About 15 species: E and SE Asia; eight species (three endemic) in China.

The revised circumscription of Ixeridium employed here basically follows the treatment by Pak and Kawano (Mem. Fac. Sci. Kyoto Univ., Ser. Biol. 15: 29–61. 1992), based on carptological and karyological investigations, which has been corroborated recently in molecular phylogenetic analyses of subtribe Crepidinae by J. W. Zhang et al. (in prep.). The placement of the two little-known species with a white pappus is, however, tentative; otherwise, the genus only comprises species with a yellowish or straw-colored pappus. Its basic chromosome number is x = 7.

1a. Pappus white.

2a. Rosette leaves oblanceolate, lyrate lobed; leaf blade attenuate into a petiole much shorter than blade; stems and branches very sparsely white echinulate ........................................................ 7. I. aculeolatum

2b. Rosette leaves triangular or pentagonal, pinnately lobed; leaf blade contracted into a winged petiole longer than blade; stems and branches glabrous and smooth ................................................................. 8. I. sagittarioides

1b. Pappus yellowish or straw-colored.

3a. Inner phyllaries (7 or)8; florets 8–11.

4a. Basal leaves narrowly spatulate to almost linear, undivided, margin entire ........................................................ 1. I. gracile

4b. Basal leaves narrowly elliptic to linear-elliptic, undivided or more rarely pinnatifid, margin denticulate, sinuate-dentate, or more rarely entire ........................................................... 2. I. laevigatum

3b. Inner phyllaries 5; florets 5–8.

5a. Involucre 4.5–6.5 mm.

6a. Plants 20–80 cm tall; basal leaves crowded, 5–17 cm; pappus 2.5–3 mm ...................................................... 3. I. beauverdianum

6b. Plants only to 15 cm tall; basal leaves in a rosette, 2–4 cm; pappus ca. 4 mm ........................................... 4. I. yunnanense

5b. Involucre 7–8 mm.

7a. Herbs 20–50 cm tall; stems slender; basal leaves oblanceolate to elliptic, 1–3 cm wide; stem leaves lanceolate, basally widened, usually clasping ............................................................... 5. I. dentatum

7b. Herbs 10–20 cm tall; stems delicate; basal leaves narrowly elliptic to linear-elliptic, less than 1 cm wide; stem leaves (if any) linear-elliptic, basally attenuate, never clasping .......................................................... 6. I. transnokoense


细叶小苦荬 xi ye xiao ku mai

Lactuca gracilis Candolle, Prodr. 7: 140. 1838; Ixeris gracilis (Candolle) Seebins.

Herbs 10–50 cm tall, perennial. Stem erect to ascending erect, weakly to moderately branched from basal third or higher up, glabrous, distantly leafy. Basal leaves narrowly spatulate, narrowly elliptic, or almost linear, 4–15 × 0.4–1 cm, basally attenuate, margin entire, apex acute. Stem leaves narrowly lanceolate to linear-lanceolate, base semiamplexicaul but never clasping. Synflorescence corymbose to paniculiform-corymbose, with some to many capitula. Capitula with 8–11 florets; peduncle capillaceous. Involucre narrowly cylindric, 7–8 mm. Phyllaries abaxially glabrous; outer phyllaries 4–6, ovate, less than ca. 1 mm, apex acute; inner phyllaries 7 or 8. Florets yellow. Anther tube and style greenish to blackish upon drying. Achenes brown, subfusiform, 4.5–5.5 mm, apex attenuate into a slender 1–1.5 mm beak. Pappus pale yellow, ca. 3 mm. Fl. and fr. May–Jul.

Forests, forest margins; 1400–2700 m. Xizang, Yunnan [Bhutan, NE India, Nepal].
Starting with J. D. Hooker (Fl. Brit. India 3: 410–411. 1881; see also FRPS 80(1): 257. 1997) and X. Zhuang (Fl. Yunnan. 13: 723. 2004), *Ixeridium gracile* has long been confused with the widespread *L. beaverdiana (= I. makinoana)*, see below, which has smaller involucre with only 5 inner phyllaries. Actually, *I. gracile* has a very restricted distribution and is a rather rare species. However, it is quite similar to *L. laevigatum*, and the delimitation between the two species should be reassessed.


_Physalis laevis_ Blume, Bijdr. 886. 1826; *Crepis laevigata* (Blume) Zollinger; *Ixeridium oldhamii* (Maximowicz) Sennikov; *Ixeris laevigata* (Blume) Engler & Maximowicz; *I. laevigata var. oldhamii* (Maximowicz) Kitamura; *I. oldhamii* (Maximowicz) Kitamura; *Lactuca laevigata* (Blume) Candolle; *L. izonica* S. Vidal; *L. oldhamii* Maximowicz; *L. stenophylla* Makino.

Herbs 10–90 cm tall, perennial, with short oblique rhizome and fibrous roots. Stems solitary or few, erect, branched from above middle or less frequently from further below, distantly leafy. Basal leaves crowded, usually present at anthesis, narrowly elliptic, or linear-elliptic, 5–32 × 0.3–3.5 cm, undivided or more rarely pinnatifid to pinnatipartite, basally attenuate and oblanceolate, lanceolate, or linear-lanceolate, acute and often mucronate; lateral lobes (if present) 2–5 pairs, sinuate-dentate, or more rarely entire, apex rounded to sometimes with an unwinged petiole-like portion, margin dentate, sinuate-dentate, or more rarely entire, apex rounded to acute and often mucronate; lateral lobes (if present) 2–5 pairs, semiorbicular, triangular-ovate, or lanceolate. Stem leaves few, broadly elliptic, ob lanceolate, lanceolate, or linear-lanceolate, base attenuate, semiamplexicaul, undivided, margin entire to sinuate-dentate, apex acute. Synflorescence corymbiform, with some to many capitula. Capitula with 8–11 florets; peduncle capillaceous. Involucre cylindric, (5–)6–7(–8) mm. Phyllaries abaxially glabrous; outer phyllaries ovate-lanceolate, longest to 1.5 mm, apex acute; inner phyllaries 8, apex acute. Florets yellow. Anther tube and style greenish to blackish upon drying. Achene brown, subfusciform, 4–5 mm, apex attenuate into a slender 1–2 mm beak. Pappus straw-colored, 3–4 mm. Fl. and fr. Feb.–Oct. 2n = 14*

Forests, forest margins, fields, wastelands, meadows; 300–3000 m. Chongqing, Fujian, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Xizang, Yunnan, Zhejiang [Japan, Nepal, Thailand, Vietnam].

*Ixeridium beaverdiana* has long been confused in continental Asia with *I. gracile* (see there), while it was recognized as a separate species (under the names *Ixeris makinoana* and *Ixeridium makinoanum*) in Japan since the 1930s.


Herbs 8–15 cm tall, perennial, rosulate. Stems solitary or few, ascending-erect to erect, branched already from base, glabrous. Rosette leaves elliptic, lanceolate, or oblanceolate, 2–4 × 0.2–0.5 cm, base attenuate into a unwinged petiole-like portion, margin entire or weakly sinuate-dentate, apex acute to rounded and mucronulate. Stem leaves few, concentrated in basal portion, similar to rosette leaves but smaller. Synflorescence laxly corymbose, with few to several capitula. Capitula with 5–8 florets; peduncle capillaceous, 3–10 mm. Involucre narrowly cylindric, 5–6 mm. Phyllaries abaxially glabrous; outer phyllaries ca. 3, ovate, longest ca. 1 mm, apex acute; inner phyllaries 5, apex acute. Florets yellow. Achene yellowish brown, subfusciform, ca. 4 mm, apex attenuate into a slender 0.5–1 mm beak. Pappus straw-colored, ca. 4 mm. Fl. and fr. Jun.

- Grasslands on mountain slopes; 1700–3600 m. Yunnan.

The pappus color in the original description of *Ixeridium yunnanense* is erroneously given as white.


Herbs 20–50 cm tall, perennial. Rhizomes shortly oblique,
with fibrous roots. Stems solitary or few, slender, erect, branched from base or higher up, glabrous, sparsely leafy. Basal leaves crowded, usually present at anthesis, narrowly oblong-eellate, narrowly elliptic, or elliptic, 4–15 × 1–3 cm, undivided or pinnatifidate, base attenuate into a winged or unwinged petiole-like portion, margin entire or with slender or very fine teeth especially in basal half, apex acute to obtuse and mucronate; lateral lobes (if present) 1–3 pairs, on basal half of leaf, narrowly triangular. Stem leaves ± lanceolate, undivided, base usually expanded and amplexicaul or auriculately clasping, margin entire or with slender or very fine teeth especially in basal half. Synflorescence corymiform, with some to many capitula. Capitula with 5–7–[11] florets; peduncle capillaceous. Involucre cylindric, 7–8 mm. Phyllaries abaxially glabrous; outer phyllaries broadly ovate, ca. 1.5 × 1 mm; inner phyllaries 5–[8], apex acute. Florets yellow [or rarely white]. Anther tube outer phyllaries broadly ovate, ca. 1.5 × 1 mm; inner phyllaries 5–[8], apex acute. Florets yellow [or rarely white]. Anther tube and style greenish to blackish upon drying. Achene brown, fusiform, 3–3.5 mm, apex attenuate into a slender ca. 1 mm beak. Pappus straw-colored, 4–5 mm. Fl. and fr. Apr.–Aug. 2n = 14, 21, 28.

Forests on mountain slopes, moist places, fields; 300–1100 m. Anhui, Fujian, Guangdong, Hebei, Heilongjiang, Jiangsu, Jiangxi, Jinlin, Liaoning, Shandong, Zhejiang [Japan, Korea, E Russia].

Ixeridium dentatum forms a polyploid complex, and several sub-species have been described to classify the diversity within this complex (Pak & Kawano, Mem. Fac. Sci. Kyoto Univ., Ser. Biol. 15: 42–45. 1992; Yahara in Iwatsuki et al., Fl. Japan 3b: 18–19. 1995, under Ixeris). In China only Ixeridium dentatum subsp. dentatum occurs; its distributional range has not been fully established yet. It has sometimes been confused with I. laevigatum, which is, however, clearly distinguished from I. dentatum subsp. dentatum through the involucres with 8 (instead of 5) inner phyllaries, 8–11 (instead of 5–7) florets per capitulum, and never (instead of usually) clasping stem leaves.


能高小苦荬 neng gao xiao ku mai


Herbs 10–20 cm, perennial, with fibrous and spreading shoot-bearing roots. Stems solitary or few, delicate, erect or ascending, often branched already from lower half, ± glabrous, not or very sparsely leafy. Basal leaves crowded, usually present at anthesis, ± narrowly elliptic to linear-elliptic, 2–9 × 0.3–0.8 cm, undivided, base attenuate into an often unwinged petiole-like portion and semiamplexicaul, margin entire or with a few slender or fine teeth or shallowly and remotely sinuate-dentate, apex acute and often mucronate. Stem leaves 1–3, linear-elliptic, smaller than basal leaves, otherwise similar but upward on stem soon reduced to bracts. Synflorescence loosely corymiform, with few to several capitula. Capitula with 5 or 6 florets; peduncle capillaceous. Involucre narrowly cylindric, 7–8 mm. Phyllaries abaxially glabrous; outer phyllaries 4 or 5, ovate, less than ca. 1 mm, apex acute; inner phyllaries 5. Florets yellow, much exceeding involucre. Anther tube and style greenish to blackish upon drying. Achene pale brown, sub fusiform, 4–5 mm, apex attenuate into a slender 1–1.5 mm beak. Pappus yellowish, 4–5 mm. Fl. and fr. Jun.–Jul. 2n = 14*.

● Alpine grassy slopes; 2600–3300 m. Taiwan.


刺株小苦荬 ci zhu xiao ku mai

Herbs to 40 cm tall, perennial, rosulate, with shoot-bearing lateral roots. Stem solitary, grayish green, erect, ± branched from middle, very sparsely white echinulate. Rosette leaves oblong-cylindric, 3.5–5.5 × 1–1.5 cm, lyrate pinnatifid, abaxially very sparsely white echinulate on midvein, adaxially glabrous, base attenuate into a winged petiole-like portion, margin entire to sinuate; lateral lobes 2 or 3 pairs, ovate to suborbicular; terminal lobe ovate to orbicular, much larger than lateral ones. Stem leaves 2, similar to basal leaves but smaller. Synflorescence laxly paniculiform to corymbose, with some capitula. Capitula with ca. 10 florets; peduncle wiry, ca. 1.5 cm to several cm, sparsely white echinulate. Involucre cylindric, ca. 8 mm. Outer phyllaries lanceolate, longest ca. 2 mm, apex acute; inner phyllaries abaxially very sparsely echinulate on midvein, apex acute to obtuse. Florets yellow. Achene pale brown, fusiform, ca. 4 mm, apex attenuate into a slender ca. 2 mm beak. Pappus white, ca. 6 mm. Fl. and fr. Sep.

● Mountain slopes; ca. 4000 m. SE Xizang (Mainling).

Only known from the type and of unclear relationship, this taxon is probably not a member of Ixeridium in its revised circumscription.


戟叶小苦荬 ji ye xiao ku mai

Lactuca sagittarioides C. B. Clarke, Compos. Ind. 265. 1876; Ixeris sagittarioides (C. B. Clarke) Stebbins; Mycelis sagittarioides (C. B. Clarke) Sennikov.

Herbs 15–35–[55] cm tall, perennial, rosulate. Stem solitary, erect, branched from basal half or higher up, sparsely hairy. Rosette leaves petiolate; petiole 3–10–[30] cm, narrowly winged, margin entire or sinuate-dentate; leaf blade pentagonal or triangular, 2–8 × 1.5–6 cm, pinnately lobed, margin sinuate-dentate; lateral and terminal lobes triangular with an acute apex. Stem leaves none or few, similar to basal leaves but smaller and less incised or undivided. Synflorescence corymbose, with some to many capitula. Capitula with 8–16 florets; peduncle wiry. Involucre narrowly cylindric, 7–8 mm. Outer phyllaries ovate to lanceolate, apex acute; inner phyllaries ca. 8–12], apex acute. Florets yellow. Achene brown [or dark purple, 3–4 mm], narrowly ovoid, apex attenuate into a slender 0.5–1 mm beak. Pappus white, 3–4 mm. Fl. Mar.

Grasslands on mountain slopes; 1900–2000 m. Yunnan [Bhutan, N India, N Myanmar, Nepal, N Thailand].

Insufficiently known and of unclear relationship, this taxon is probably not a member of Ixeridium and perhaps not even of subtribe Crepidinae but of subtribe Lactucinae.

苦荬菜属 ku mai cai shu

Shi Zhu (石铸 Shih Chu); Norbert Kilian


Herbs, annual or perennial, often rosulate. Stems ± erect, sometimes also long creeping and with erect flowering branches. Synflorescence usually corymbose. Capitula with (12–)15–25–(40) florets. Involucre cylindric to narrowly campanulate. Phyllaries in several series, glabrous; outer phyllaries several, longest 1/4–1/2 as long as inner ones; inner phyllaries usually 8, linear-lanceolate to lanceolate, equal in length, glabrous, margin usually scarious. Receptacle naked. Florets yellow, rarely whitish or purplish. Achene brown, ± fusiform, not compressed, with 10 (5 main ribs alternating with 5 ± equal secondary ribs) very prominent ± winglike ribs, space between ribs narrowly V- or U-shaped, apex contracted or attenuate into a filiform or slender beak. Pappus white, bristles scabrid.

About eight species: E and S Asia; six species in China.

The revised circumscription of Ixeris employed here follows the treatment by Pak and Kawano (Mem. Fac. Sci. Kyoto Univ., Ser. Biol. 15: 29–61. 1992), based on carpological and karyological investigations, which also includes the former monotypic Chorisia accommodating I. repens. Pak and Kawano’s concept of the genus has been corroborated recently in molecular phylogenetic analyses of subtribe Crepidae by J. W. Zhang et al. (in prep.). Its basic chromosome number is x = 8.

1a. Plants with (above or below ground) long creeping stems.

2a. Leaves palmately 3–(5)–lobed ........................................................................................................... 3. I. repens

2b. Leaves undivided or pinnately lobed.

3a. Leaf blade spatulate, elliptic, or almost linear, 3–25–(35) cm; involucre (0.8–)1–1.4 cm ........................................... 2. I. japonica

3b. Leaf blade orbicular, broadly elliptic, ovate, or obovate, ≤ 3 cm; involucre ≤ 1 cm ................................... 4. I. stolonifera

1b. Plants without creeping stems.

4a. Stem leaves with sagittately clasping basal with lobes distinctly directed backward; involucre 5–6 mm .................................................................................................................................................. 1. I. polycephala

4b. Stem leaves usually with narrowed semiamplexicaul base or exceptionally clasping with almost rectangularly sideways directed basal lobes; involucre 6–11 mm.

5a. Longest outer phyllary 1–1.5 mm; capitula with 15–25 florets ........................................................................... 5. I. chinensis

5b. Longest outer phyllary ca. 3 mm; capitula with 25–40 florets ........................................................................ 6. I. tamagawaensis

1. Ixeris polycephala Cassini ex Candolle, Prodr. 7: 151. 1838.

苦荬菜 ku mai cai

Crepis bonii Gagnepain; Ixeris dissecta (Makino) C. Shih; I. fontinalis Candolle; I. matsumurae (Makino) Nakai; I. polycephala f. dissecta (Makino) Ohwi, I. polycephala var. dissecta (Makino) Nakai; Lactuca biariculata Vaniot & H. Léveillé; L. matsumurae var. dissecta Makino; L. polycephala (Cassini) Bentham.

Herbs 10–50 cm tall, annual. Stem solitary, erect, branched already in lower half or higher up, glabrous, leafy. Basal leaves present at anthesis, narrowly ob lanceolate, lanceolate, linear-lanceolate, or linear, 6–22 × 0.3–1.5 cm, undivided or pinnatifid to pinnatisect or runcinate so, base attenuate into a well-developed petiolo-like portion and ± semiamplexicaul, margin entire or dentate, apex acute; lateral lobes (if present) 2–5 pairs, on leaf blade basal 1/2–2/3. Stem leaves lanceolate to linear-lanceolate, smaller, rather undivided, base strongly sagittately clasping, margin mostly entire, otherwise similar to basal leaves. Synflorescence corymbose, with few to some capitula. Capitula with 20–25 florets; peduncle capillaceous. Involucre cylindric and 5–6 × 2–3 mm at anthesis, broadly campanulate and 7–8 × 4–5 mm in fruit. Phyllaries abaxially glabrous; outer phyllaries 4–6, ovate, longest less than 1 mm, apex acute; inner phyllaries 8, apex acute to obtuse. Florets yellow or rarely white. Anther tube and style greenish to blackish upon drying. Achene brown to reddish brown, ellipsoid, ca. 4 mm, apex contracted into a slender 1–1.5 mm beak. Pappus ca. 4 mm; Fl. and fr. Feb.–Oct. 2n = 16.

Forest margins, thickets, grasslands, along rivers and streams, by fields, open areas; 100–2000 m. Anhui, Chongqing, Fujian, Guangdong, Guangxi, Guizhou, ?Henan, ?Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Afghanistan, Bhutan, Cambodia, N India, Japan, Kashmir, Laos, Myanmar, Nepal, Vietnam].

The leaves of the species, as in other species of the genus, are very variable with respect to their division, ranging from entire to strongly dissected.

The entire plant is used medicinally. The many uses include detoxifying, stopping bleeding, promoting tissue regeneration, removing necrotic tissue, decreasing inflammation of soft tissues, and stopping uterine bleeding, but the main use is for treating furuncles.


剪刀股 jian dao gu

Lapsana japonica N. L. Burman, Fl. Indica, 174. 1768; Barkhausia repens (Loureiro) Sprengel; Chondrilla debilis
Herbs 15–35 cm tall, perennial, glabrous, rosulate. Taproot with lateral shoot-bearing roots producing secondary leaf rosettes. Stems several, flagelliform, long creeping above ground; nodes 1 to several cm apart, most with adventitious roots and a single leaf. Flowering stems from rosettes and leaf axils of creeping stems, erect, to 35 cm, with or without adventitious roots, producing secondary leaf rosettes. Leaf blades orbicular, broadly elliptic, ovate, or obovate 1–4 cm; leaf blade orbicular, broadly elliptic, ovate, or obovate, 1–3 × 0.8–1.5 cm, undivided or weakly pinnatifid, base rounded, cuneate, or truncate, margin entire, apex obtuse, rounded, or emarginate and often mucronulate; lateral lobes (if present) 1 to few pairs, triangular to elliptic, apex acute to obtuse. Flowering branches from leaf axils, erect, to 10 cm, with or without adventitious roots. Synflorescence laxly corymbiform, with 1–6 capitula. Capitula with 20–25 florets; peduncle wiry, 0.5–3 cm, with ovate bracts. Involucre cylindric, 10–12 × 4–5 mm at anthesis, to 1.4 cm in fruit. Phyllaries abaxially glabrous; outer phyllaries ovate to lanceolate, longest 4–6 mm, apex acute; inner phyllaries 8, apex acute. Florets yellow. Anther tube and style greenish to blackish upon drying. Achene brown, fusiform to subfusiform, 5–7 mm, apex attenuate into a moderately slender 0.5–2 mm beak. Pappus 5–6 mm. Fl. and fr. Apr.–Oct. 2n = 16*.

Open sandy beaches; near sea level. Fujian, Guangdong, Hainan, Hebei, Jiangsu, Liaoning, Shandong, Taiwan, Zhejiang [Japan, Korea, E Russia, Vietnam].


沙苦荬菜 sha ku mai cai

Ixeris capillaris Nakai; I. stolonifera subsp. capillaris (Nakai) Kitamura; I. stolonifera var. sinuata (Makino) Takeda; Lactuca nummulariaefolia H. Léveillé & Vaniot; L. stolonifera (A. Gray) Bentham ex Maximowicz; L. stolonifera var. sinuata Makino.

Herbs 10–15 cm tall, perennial, rosulate, glabrous. Taproot with lateral shoot-bearing roots, producing secondary leaf rosettes. Stems several, flagelliform, long creeping above ground; nodes 1–7 cm apart, most with adventitious roots and a single leaf. Flowering stems from rosettes and leaf axils of creeping stems, erect, to 15 cm, leafless. Leaves present at anthesis; petiole 1–4 cm; leaf blade orbicular, broadly elliptic, ovate, or obovate, 1–3 × 0.8–1.5 cm, undivided or weakly pinnatifid, base rounded, cuneate, or truncate, margin entire, apex obtuse, rounded, or emarginate and often mucronulate; lateral lobes (if present) 1 or 2 pair(s), on basal half of leaf blade, triangular, small. Synflorescence laxly and weakly corymbiform, with 1–6 capitula. Capitula with 15–25 florets; peduncle capillaceous, 0.1 cm. Involucre narrowly cylindric, 7–8 × 3–4 mm at anthesis, to 10 mm in fruit. Phyllaries abaxially glabrous; outer phyllaries ovate to lanceolate, longest to 2(–3) mm, apex acute; inner phyllaries 8, apex acute to obtuse. Florets yellow. Anther tube and style greenish to blackish upon drying. Achene brown, fusiform, 4–6 mm, apex attenuate into a filiform 1.5–3 mm beak. Pappus 4–5 mm. Fl. and fr. May–Oct. 2n = 16*.

Moist areas on gravelly mountain slopes; 1500–2000 m. ?Anhui, Jiangsu, Jiangxi, Taiwan, Zhejiang [Japan, Korea; introduced to E North America].


中华苦荬菜 zhong hua ku mai cai
CICHORIEAE

Herbs 5–50 cm tall, perennial, rosulate, glabrous. Taproot, often with shoot-bearing lateral roots. Stems usually few to several, rarely solitary, ascending-erect to erect, branched from base or higher up. Rosette leaves ob lanceolate, elliptic, nar rowly elliptic, or ± linear, 6–24 × 1–2 cm, undivided or pin natifid to pinnatifid, basally attenuate, margin entire or sinu ate-dentate, apex obtuse, acute, or attenuate; lateral lobes 2–7 pairs, narrowly triangular, linear-triangular, or linear. Stem leaves (0 or)1–4, narrowly lanceolate to linear-lanceolate, mostly undivided or more rarely pinnatifid, base semim plexicaul and usually not or rarely with a basal pair of sideward directed clasping lobes, margin entire, apex acuminate. Synflo rescence laxly corymbiform, with few to many capitula. Cap itu la with 15–25 florets; peduncle wiry, ca. 1 to several cm. In volucre cylindric, 6–11 mm. Phyllaries abaxially glabrous, apex acute; outer phyllaries ± ovate, longest 1–1.5 mm; inner phyllaries 8. Florets bright yellow, pale yellow, white, or purplish. Anther tube and style greenish to blackish upon drying. Achene brown, subfusciform, 4–6 mm, apex attenuate into a slender 2.5–3 mm beak. Pappus ca. 5 mm. Fl. and fr. Jun–Oct.

Grasslands on mountain slopes, forests, forest margins, along rivers, ravines, open areas, degraded shrublands, thickets, riverbanks, rock crevices, sandy soil areas, fields, field margins, wastelands, roadsides; below 100–4000 m. Anhui, Chongqing, Fujian, Gansu, Guang dong, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [Cambodia, Japan, Korea, Laos, Mongolia, E Russia, Thailand, Vietnam].

Ixeris chinensis includes diploid, triploid, and tetraploid cytotypes. Pak et al. (Acta Phytotax. Geobot. 48: 187–196. 1997) have shown that all three cytotype are present in mainland Asia, while in Taiwan only the diploid cytotype and in Japan only the triploid and tetraploid cytotypes occur. Otherwise, all three cytotypes frequently seem to occur sympatrically. The triploid and tetraploid cytotypes have been identified with I. chinensis subsp. strigosa (see Kitamura, Mem. Coll. Sci. Kyoto Imp. Univ., Ser. B, Biol. 23: 112–116. 1956), which has long involucres (9–10 mm) and achenes as well as whitish or pale purplish florets. The diploid cytotype has been identified with I. chinensis subsp. chinensis, which has involucres of 6–8 mm and yellow florets. The third subspecies recognized by Kitamura, I. chinensis subsp. versicolor (sometimes even treated as two separate species, I. graminicola and I. graminifolia, see, e.g., under Ixeridium, in Tzvelev, Fl. URSS 29: 388–392. 1964; Rast. Tsentral. Azii 14b: 62–65. 2008) appears rather to include forms intermediate between the former two at least with respect to involucre length (8–9 mm) and floret color (variably yellow, white, or purplish). It was not included in the analysis by Pak et al. (loc. cit.) and is little understood, even with respect to its actual delimitation from I. chinensis subsp. strigosa. Until further studies, such as started by Pak et al. (loc. cit.), are available that also include I. chinensis subsp. versicolor, the taxonomy of I. chinensis remains unsatisfactory. For the time being, it appears appropriate basically to maintain the classification of Kitamura (loc. cit. 1956) with three subspecies, the delimitation between them, however, not being clear-cut, and especially between I. chinensis subsp. versicolor and I. chinensis subsp. strigosa often questionable in material from China. The distribution ranges given below should therefore be taken with great caution. Leaf shape is very variable in I. chinensis; this variation, however, follows patterns not unusual in the genus and the tribe and is taxonomically of no value.

1a. Involucre 6–8 mm; florets bright or pale yellow; stem leaves usually 2–4 .......................... 5a. subsp. chinensis

1b. Involucre 8–11 mm; florets white, pale yellow, purplish, or rarely bright yellow; stem leaves usually 1 or 2.

2a. Involucre 9–11 mm; florets white to pale purplish; plants 25–50 cm tall ........................................ 5b. subsp. strigosa

2b. Involucre 8–9 mm; florets variable within a population and white, purplish, pale yellow, or rarely also bright yellow; plants usually 10–20 cm tall ............................. 5c. subsp. versicolor

5a. Ixeris chinensis subsp. chinensis

中华苦荬菜(原亚种) zhong hua ku mai cai (yuan ya zhong)

Prenanthes chinensis Thunberg in Murray, Syst. Veg., ed. 14, 174. 1784; Barkhausia tenella Bentham; Chondrilla chinensis (Thunberg) Poiret; Ixeridium chinense (Thunberg) Tzvelev; Ixeris chinensis var. saxatilis (Kitamura) Kitamura; I. lacerrima (Hayata) Kitagawa; Lactuca chinensis (Thunberg) Nakai; L. flavissima Hayata; L. lacerrima Hayata; L. lacerrima var. saxatilis Kitamura; L. taitoensis Hayata; Paraixeris chinensis (Thunberg) H. S. Pak; Youngia chinensis (Thunberg) Candolle.


Grasslands on mountain slopes, open areas, degraded shrublands, thickets, riverbanks, rock crevices, fields, field margins, roadsides; below 100–4000 m. Anhui, Chongqing, Fujian, Gansu, Guangdong, Guizhou, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [Cambodia, Korea, Laos, E Russia, Thailand, Vietnam].

5b. Ixeris chinensis subsp. strigosa (H. Léveillé & Vaniot)


光滑苦荬 guang hua ku mai


Herbs 25–50 cm tall. Stems solitary or few, erect. Rosette leaves to 24 cm. Stem leaves 1, 2, or rarely more. Capitula with 20–25 florets. Involucre 9–11 mm. Florets white to pale purplish. Achene 5–6 mm. Fl. and fr. Apr–Jul. 2n = 24, 32*.

Grasslands on mountain slopes, open areas; 500–1500 m. ?Anhui, Hebei, Heilongjiang, ?Hebei, Jiangsu, Jilin, Liaoning, Nei Mongol, ?Shandong, ?Shanxi [Japan, Korea, Mongolia, E Russia].

Delimitation of Ixeris chinensis subsp. strigosa from I. chinensis subsp. versicolor needs thorough evaluation, and the present delimitation may perhaps be artificial. The distribution ranges of these two subspecies are therefore questionable.


*Shi Zhu* (石铸 Shii Chu); Norbert Kilian

**Herbs** 10–50 cm tall, perennial, with a taproot and shoot-base; leaves usually 10–20 cm tall. Herbs usually 10–20 cm tall. Stems several, ascending-erect. Rosette leaves to 17 cm. Stem leaves usually (0 or)1 or 2. Capitula with 15–25 florets. Involucre 8–9 mm. Floret color variable within a population, white, purplish, pale yellow, or rarely also bright yellow. Achene 4–6 mm. Fl. and fr. May–Aug.


*Shi Zhu* (石铸 Shii Chu); Norbert Kilian

**Herbs** 10–20 cm tall. Stems several, ascending-erect. Rosette leaves to 17 cm. Stem leaves usually (0 or)1 or 2. Capitula with 15–25 florets. Involucre 8–9 mm. Floret color variable within a population, white, purplish, pale yellow, or rarely also bright yellow. Achene 4–6 mm. Fl. and fr. May–Aug.


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stem similar to lower ones but gradually smaller and narrower toward stem apex, margin rather entire. Synflorescence narrowly racemiform, with many capitula. Peduncle wiry, 0.5–2 cm. Involucre brownish green, narrowly cylindric, 8–9 mm. Phyllaries abaxially glabrous; outer phyllaries ovate to lanceolate, longest 2.5–3 mm, apex acute; inner phyllaries ca. 8, mid-vein subapically often crested, apex acute and ± ciliate. Achene greenish brown, fusiform, 4.5–6.5 mm, apex truncate. Pappus ca. 6 mm. Fl. and fr. Jul–Sep. 2n = 16.

Sandy soil in steppes, alkaline areas; 900–1500 m. Gansu, Nei Mongol [Mongolia, E Russia].

All parts of this herb are used medicinally, in particular for treating serious cases of furuncles.


草甸小苦荬菜  cao dian xiao ku ju cai

*Sonchus dentatus* Ledebour, Icon. Pl. 1: 21. 1829; *Crepis pratensis* C. Shih; *Prenanthes angustifolia* Boulos; *Sonchella dentata* var. *tibetica* (Ostenfeld) Sennikov; *S. pratensis* (C. Shih) Tzvelev; *S. tibetica* (Ostenfeld) Tzvelev; *Sonchus dentatus* var. *tibeticus* Ostenfeld.

Herbs 15–50 cm tall, perennial, with a taproot and shoot-bearing lateral roots. Caudex with residues of old leaf bases. Stem solitary, erect, mostly unbranched below synflorescence, ± glabrous, leafy. Basal and lower stem leaves narrowly spatulate, 3–11 × 0.7–1.5 cm, often somewhat fleshy, glabrous, base attenuate into a petiole-like portion and semiamplexicaul, margin entire or sinuate-dentate, apex obtuse to acute. Middle and upper stem leaves few, lanceolate, similar to lower ones but gradually smaller and narrower toward stem apex, margin rather entire. Synflorescence paniculiform, with many capitula. Peduncle wiry, usually shorter than involucre. Involucre dark green, narrowly cylindric, 8–10 mm. Phyllaries abaxially ± glabrous [to setose along midvein]; outer phyllaries ovate to lanceolate, longest 2.5–3 mm, apex acute; inner phyllaries 8, mid-vein subapically usually plane, apex ± acute. Achene brown, fusiform, ca. 5 mm, apex truncate. Pappus ca. 7 mm. Fl. and fr. Jun–Sep.

Marshes and saline meadows by lakes and streams; 2500–3700 m. Qinghai [Mongolia, E Russia].

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76. **Dubyaea** Candolle, Prodr. 7: 247. 1838.

厚喙菊属  hou hui ju shu  Norbert Kilián

Herbs, perennial, often rosulate, caulescent or rarely acaulescent with 1 or few scapes. Stems leafy or leafless, with ± stiff, yellowish brown, reddish to purplish brown, or blackish mostly glandular hairs, rarely glabrous. Synflorescence of a solitary capitulum or corymbiform, rarely umbelliform with few to several or rarely to 20 capitula. Capitula declined, pendent, or erect, with several (ca. 7) to numerous (ca. 70) florets. Involucre cylindric, broadly campanulate, or almost hemispheric. Phyllaries in several series, often dark green to purplish or blackish mostly glandular hairs, rarely glabrous. Phyllaries abaxially ± glabrous, leafy. Basal and lower stem leaves few, lanceolate, similar to lower ones but gradually smaller and narrower toward stem apex, margin rather entire. Synflorescence paniculiform, with many capitula. Peduncle wiry, usually shorter than involucre. Involucre dark green, narrowly cylindric, 8–10 mm. Phyllaries abaxially ± glabrous [to setose along midvein]; outer phyllaries ovate to lanceolate, longest 2.5–3 mm, apex acute; inner phyllaries 8, mid-vein subapically usually plane, apex ± acute. Achene brown, fusiform, ca. 5 mm, apex truncate. Pappus ca. 7 mm. Fl. and fr. Jun–Sep.

About 15 species: Bhutan, SW China, N India, N Myanmar, Nepal; 12 species (eight endemic) in China.

*Dubyaea forrestii* Mangain & R. R. Rao (Edinburgh J. Bot. 65: 1. 2008) was described from rocky alpine slopes in Gaoligong Shan in NE Myanmar, close to the border with China or possibly inside Yunnan (“[F]lank of the N’Maikha–Salwin [Nu Jiang] divide, lat. 26°30'N, alt. 11,000’ [3700 m]”). It was described as being similar to *D. atrapurpurea* and is known only from the type, *G Forrest 29660* (holotype, BM; isotype, E), collected in 1931.

1a. Florets yellow.

2a. Stems, branches, and phyllaries glabrous; leaves undivided and entire or very scarcely and shallowly dentate, mostly rosulate and stem with bracts only .................................................................................. 5. *D. tsarongensis*

2b. Stems, branches, and phyllaries with stiff yellowish brown, reddish, purplish brown, or blackish mostly glandular hairs; leaves dentate to pinnately lobed, sometimes basally crowded but usually caulescent.

3a. Stem with yellowish brown stiff hairs .......................................................................................... 4. *D. emeiensis*

3b. Stem with brown, reddish brown, purplish, or blackish stiff long glandular or non-glandular hairs.

4a. Capitula with 40–50 florets; involucre broadly campanulate ............................................... 1. *D. hispida*

4b. Capitula with less than 15 florets; involucre cylindric or narrowly cylindric.

5a. Involucre ca. 1.5 cm; capitula with 9–19 florets; achene ca. 7 mm ........................................ 2. *D. jinyangensis*

5b. Involucre 1–1.1 cm; capitula with 9–13 florets; achene 4.5–5.5 mm ........................................ 3. *D. blinii*

1b. Florets of some shade of purple (pale, bluish, reddish, or brownish) or blue.

6a. Plants rosulate, acaulescent; capitula on 1–7 scapes, less than 10 cm.

7a. Rosettes with 3–7 scapes; plants with long stiff glandular hairs especially on scapes 10. *D. amoena*

7b. Rosettes with a solitary scape; plants glabrous ............................................................................. 11. *D. gombalana*
6b. Plants rosulate or not, caulescent with branched leafy or more rarely leafless but branched stem (15–)30–100 cm tall.

8a. Capitula erect; pappus ?whitish ................................................................. 7. D. cymiformis

8b. Capitula nodding; pappus yellowish to brown.

9a. Lower and middle stem leaves at most tapering toward base but not contracted into a petiole-like rachis; stems, branches, and phyllaries glabrous ......................................... 9. D. glaucescens

9b. At least lower and middle stem leaves contracted into a petiole-like unwinged or winged rachis; long stiff blackish hairs present at least in apical portion of stem.

10a. Phyllaries glabrous except for a ciliate margin ........................................................................... 12. D. stebbinsii

10b. Phyllaries on abaxial midvein with long stiff brown to blackish glandular hairs.

11a. Involucre broadly campanulate, 1.8–2.2 × 2–2.5 cm ............................................................. 6. D. atropurpurea

11b. Involucre campanulate, 1.5–1.7 × 1–1.5 cm ................................................................. 8. D. rubra

1. **Dubyaea hispida** Candolle, Prodr. 7: 247. 1838.

厚喙菊  hou hui ju

*Hieracium hispidum* D. Don, Prodr. Fl. Nepal. 165. 1825, not Forsskål (1775); *Crepis blinii* Hutchinson; *C. duboaea* (C. B. Clarke) C. Marquand & Airy Shaw; *Dubyaea hispida* (Hutchinson) C. Shih; *D. lanceolata* C. Shih; *D. pteropoda* C. Shih; *Lactuca duboaea* C. B. Clarke.

Herbs 20–60 cm tall, perennial, with creeping rhizomes. Stem erect, branched from below middle or higher up, leafy, with long blackish stiff glandular hairs and pale curly weak hairs. Basal and lower stem leaves sessile or base attenuate into a long petiole-like portion, oblanceolate, elliptic, or narrowly obovate, 5–18 × 1.5–6 cm, sinuate-dentate to shallowly lyrate-pinnatifid, both faces with hairs or mainly abaxially, both faces with hairs or mainly abaxially, base narrowly to widened and ± clasping, margin mucronulate-dentate, apex acute to acuminate. Middle and upper stem leaves similar to lower stem leaves but ± lanceolate, smaller, base auriculately clasping; uppermost stem leaves linear-lanceolate, reduced in size. Synflorescence corymbose, with 2–7 capitula. Capitula nodding, with 40–50 florets; peduncle blackish pilose. Involucre campanulate, 1.8–2 × 1–1.5 cm. Phyllaries with long dark brown to blackish stiff glandular hairs on midvein except on innermost ones; outer phyllaries rather few, narrowly lanceolate to linear, closely approaching inner ones in length, apex acute to acuminate; inner phyllaries many, lanceolate, margin acutely often ± brownish ciliate to fringed. Florets yellow. Achene brown, 7–9 mm, with several ribs, apex long attenuate and paler. Pappus yellowish, 0.8–1.2 cm. Fl. and fr. Jul–Nov. 2n = 16.

Forests, forest margins, meadows, thickets; 2700–4500 m. Sichuan, Yunnan [Bhutan, India (Sikkim), N Myanmar, Nepal].

*Dubyaea hispida* is here considered in the wider sense established by Stebbins (Mem. Torrey Bot. Club 19(3): 19, 1940) and taken up by X. Zhuang (Fl. Yunnan. 13: 704. 2004), who consequently included also the segregates *D. lanceolata* and *D. pteropoda*, distinguished only by minor differences in leaf shape. The underground parts are usually described as creeping rhizomes from which the stems arise; no specimen, however, has been seen where a true rhizome is preserved. The underground parts preserved in the material seen could also be interpreted as root-borne shoots.


金阳厚喙菊  jin yang hou hui ju

Herbs to 15 cm tall, perennial, with taproot. Stem solitary, erect, apically branched and with lanceolate bracts, with long stiff blackish hairs. Leaves sessile, narrowly elliptic, isomorphic, 7–8 × ca. 2 cm, abaxially with long reddish brown to brown hairs on veins, base auriculate and semiamplexicaul, margin coarsely dentate to ± lobed, apex acuminate. Synflorescence corymbose, with ca. 9 capitula. Capitula erect, with ca. 7 florets. Involucre narrowly cylindric, ca. 1.5 × 0.5 cm. Phyllaries dark green, abaxially with long stiff blackish hairs on midvein; outer phyllaries rather few, ovate to lanceolate, 2–5 × ca. 1 mm, apex acute to obtuse; inner phyllaries lanceolate, apex acute to obtuse. Florets yellow. Achene brown, ca. 7 mm, with 8 unequal ribs, apex truncate. Pappus brownish, ca. 7 mm. Fl. and fr. Sep.

- Mountain slopes; ca. 3400 m. S Sichuan (Jinyang).

3. **Dubyaea blinii** (H. Léveillé) N. Kilian, comb. nov.

刚毛厚喙菊  gang mao hou hui ju


Herbs 15–35 cm tall, perennial, ± rosulate. Caudex strong, with residues of old leaf bases, brown lanate in leaf axils. Stem erect or curved-erect, usually branched apically, densely setose with brownish to purplish spreading hairs, moderately leafy. Rosette leaves (present or not at anthesis) and lower stem leaves oblanceolate to elliptic, 7–18 × 1.5–4 cm, undivided and coarsely sinuate-dentate or runcinate-dentate to pinnatifid, abaxially densely and adaxially sparsely setose with brownish to purplish spreading hairs, base attenuate into a cuneately winged petiole-like portion and semiamplexicaul, margin sinuate-dentate, apex acute to acuminate; lateral lobes triangular, ± retrorse, apex acute. Middle and upper stem leaves similar to lower leaves but smaller, base without a petiole-like portion but semiamplexicaul. Synflorescence densely corymbose, with 10–20 capitula. Capitula erect, with 9–13 florets; peduncle 2–8 mm, densely setose with brownish to purplish spreading hairs. Involucre cylindric, 1–1.1 cm. Phyllaries abaxially brownish to purplish setose along midvein; outer phyllaries triangular to lanceolate, longest 2.5–3 mm, apex acute; inner phyllaries ca. 8, with thin scarious margin, apex acute. Florets yellow. Achene pale brown, 4.5–5.5 mm, with ca. 12 unequal ribs, glabrous, apex truncate. Pappus pale brown, 5–7 mm. Fl. and fr. Jul–Oct.

- Mountain pastures, open grassy slopes; ca. 2600 m. W Sichuan, SW Yunnan.
Dubyaea biliii has been considered as a species of Youngia since its inclusion by Babcock and Stebbins (Univ. Calif. Publ. Bot. 18: 227–229, 1943, as *T. setigera*) in that genus. Examination of the type material, however, revealed that it is grossly misplaced in *Youngia*, from which it differs by the indumentum of leaves, stems, and phyllaries, and its achene and pappus features, but conveniently fits into *Dubyaea*, where it may perhaps be more closely related to *D. jinyangensis*.


峨眉厚喙菊 e mei hou hui ju

Herbs to 13 cm tall, perennial. Stem erect, apically branched, purplish red and glabrous below middle, pale green and densely hispid with stiff yellowish brown hairs above middle, leafy. Lower and middle stem leaves oblanceolate to elliptic, 5–9 × 2–3 cm, thick, glabrous, abaxially dark purple, base cuneate-attenuate and tapering into a narrow or petiole-like portion, margin dentate, apex acute to acuminate. Upper stem leaves opposite, sessile, lanceolate, 5–6 × 2–3 cm, base rounded to cuneate, otherwise like middle stem leaves; uppermost leaves reduced in size to broadly linear acuminate bracts. Synflorescence umbelliform, with 7 capitula each with a peduncle equal length. Capitula with 20–25 florets; peduncle ± thickened, with stiff brown hispider hairs. Involucre narrowly campanulate, 1.8–2.2 × 1.3–1.5 × ca. 0.8 cm. Phyllaries abaxially blackish green and with stiff brown hairs on midvein; outer phyllaries triangular to lanceolate, longest ca. 4.5 × 1.2 mm, apex acute; inner phyllaries with apex obtuse to rounded. Florets yellow. Achene brown, ca. 5 mm, with ca. 14 unequal ribs. Pappus yellowish, ca. 7 mm. Fl. and fr. Jul.

- Forests; ca. 2500 m. Sichuan (Emei Shan).

*Dubyaea emeiensis* is a poorly known species only known from the type collection from Emei Shan.


察隅厚喙菊 cha yu hou hui ju


Herbs 6–30 cm tall, perennial, usually rosulate, with a taproot and a short ± subterranean caudex. Stem slender, usually unbranched or rarely 1-branched, glabrous, leafless and with only a few linear bracts or more rarely with a few leaves in basal portion. Rosette leaves oblanceolate to elliptic, 3–11 × 0.5–1.5 cm, glabrous, base usually ± attenuate into a petiole-like portion, margin entire or sparsely mucronulate-dentate, apex rounded and mucronulate. Stem leaves (if present) 1–3, oblanceolate to lanceolate, smaller than rosette leaves, base attenuate to ± auriculately clasping, otherwise similar to rosette leaves. Capitulum solitary or more rarely a pair, pendent, with 15–25 florets. Involucre narrowly campanulate, 1.2–1.6 cm. Phyllaries abaxially ± uniformly dark green, glabrous, apex acute; outer phyllaries ovate to broadly lanceolate, approaching inner ones in length; inner phyllaries ca. 8. Florets yellow. Achene not seen when mature, ca. 5 mm, apex truncate. Pappus yellowish, 6–8 mm. Fl. and fr. Aug–Oct.

Herbs to 13 cm tall, perennial. Stem erect, basally branched from basal portion, leafy; branches ascending, densely covered with dark brown to blackish long stiff glandular hairs. Basal and lower stem leaves hairy or sometimes glabrescent, base narrowed and sometimes ± expanded and clasping, margin mucronulate-sinuate-dentate; terminal lobe triangular-ovate, to 20 × 20 cm, basally cordate to sagittate then contracted into a at least distally winged petiole-like rachis to 50 cm with 0–3 pairs of small somewhat distant broadly triangular lateral lobes in apical portion, apex obtuse, acute, or rounded. Middle and upper stem leaves similar to lower stem leaves but (much) smaller; leaf blade lanceolate, oblanccolate, or elliptic, less or not divided and sinuate-dentate, proximally much less narrowed and base distinctly clasping; uppermost stem leaves ± elliptic, with a narrow base. Synflorescence corymbiform, with 3–8 capitula. Capitula nodding, with 60–70 florets; peduncle usually long, blackish pilose. Involucre broadly campanulate, 1.8–2.2 × 2.5 cm. Phyllaries dark green to blackish, with stiff long blackish glandular hairs along midvein except for innermost ones; outer phyllaries few, narrowly lanceolate, approaching inner in length; inner phyllaries many, broadly lanceolate, 4–6 mm wide, margin apically brownish ciliate to fringed, apex acute to acuminate. Florets dark purplish. Achene brown, 6–8 mm, with several strong ribs. Pappus dirty yellowish to pale brownish, 7–10 mm. Fl. and fr. Jul.–Oct.

*Picea* forest margins, alpine meadows, thickets; 3000–4100 m. Sichuan, Yunnan [NE Myanmar].

The basionym *Lactuca atropurpurea* is illegitimate as a later homonym; thus, according to Art. 58.1 of the Vienna Code, the combination *Dubyaea atropurpurea* is treated as a replacement name.

Following X. Zhuang (Fl. Yunnan. 13: 705. 2004), *Dubyaea panduriformis*, distinguished from *D. atropurpurea* by minor leaf features only, is considered as conspecific.


紫花厚喙菊 zi hua hou hui ju

Herbs 30–80(–120) cm tall, perennial, with a stout taproot. Stem stout, erect, branched from middle or higher up, with long stiff dark brown to blackish glandular hairs, leafy. Basal and lower stem leaves hairy or sometimes glabrescent, base narrowed and sometimes ± expanded and clasping, margin mucronulate-sinuate-dentate; terminal lobe triangular-ovate, to 20 × 20 cm, basally cordate to sagittate then contracted into a at least distally winged petiole-like rachis to 50 cm with 0–3 pairs of small somewhat distant broadly triangular lateral lobes in apical portion, apex obtuse, acute, or rounded. Middle and upper stem leaves similar to lower stem leaves but (much) smaller; leaf blade lanceolate, oblanccolate, or elliptic, less or not divided and sinuate-dentate, proximally much less narrowed and base distinctly clasping; uppermost stem leaves ± elliptic, with a narrow base. Synflorescence corymbiform, with 3–8 capitula. Capitula nodding, with 60–70 florets; peduncle usually long, blackish pilose. Involucre broadly campanulate, 1.8–2.2 × 2.5 cm. Phyllaries dark green to blackish, with stiff long blackish glandular hairs along midvein except for innermost ones; outer phyllaries few, narrowly lanceolate, approaching inner in length; inner phyllaries many, broadly lanceolate, 4–6 mm wide, margin apically brownish ciliate to fringed, apex acute to acuminate. Florets dark purplish. Achene brown, 6–8 mm, with several strong ribs. Pappus dirty yellowish to pale brownish, 7–10 mm. Fl. and fr. Jul.–Oct.


伞房厚喙菊 san fang hou hui ju

Herbs to 45 cm tall, perennial. Stem erect, basally and middle tinged with purplish red, branched from basal portion, leafy; branches ascending, densely covered with dark brown to blackish long stiff glandular hairs. Basal and lower stem leaves oblanceolate to elliptic, ca. 18 × 4 cm, lyrately pinnatipartite,
basally attenuate, margin mucronulately dentate; lateral lobes 4 or 5 pairs, elliptic to oblquely ovate; terminal lobe broadly elliptic to oblanceolate. Middle stem leaves similar to lower stem leaves but base ± auriculately clasping; uppermost stem leaves linear to lanceolate, undivided or almost so, apex acute to rounded. Synflorescence corymiform, with ca. 15 capitula. Capitula erect, with numerous florets. Involucre broadly campanulate, ca. 1 × 2 cm. Phyllaries dark green, apex acute to acuminate; outer phyllaries rather few, narrowly lanceolate, with long brown stiff glandular hairs and weak curly pale uniseriate hairs on midvein and along margin; inner phyllaries except innermost ones with long, brown stiff glandular hairs along midvein. Florets purplish. Achene not seen when mature. Pappus with the whitish, ca. 1 cm. Fl. Jul.

Known only from the type, this species is probably related to Dubyaea oligocephala (Schultz Bipontinus) Stebbins from the W Himalaya and D. hispida C. Shih.


Herbs 30–60 cm tall, perennial. Stem erect, branched apically or rarely from basal portion, and middle usually purplish red, with long blackish stiff glandular hairs and pale curly weak hairs, leafy. Basal and lower stem leaves hairy particularly abaxially, margin mucronulately sinuate-dentate; terminal lobe triangular to triangular-ovate, 3.5–8 × 2.5–6 cm, basally cordate, truncate, or shortly cuneate and contracted into an unwinged or at least apically winged petiole-like rachis of 4–10 cm with 0–3 pairs of small sometimes indistinct triangular to ovate lateral lobes in upper portion, apex acute. Middle and upper stem leaves similar to lower stem leaves but without or with a short winged petiole-like rachis, lanceolate to ovate-lanceolate, small, base narrow to somewhat auriculately clasping. Synflorescence sparsely and ± distantly corymiform, with 3–6 capitula. Capitula nodding, with 50–60 florets; peduncle usually long blackish pilose. Involucrum campanulate, 1.5–1.7 × 1–1.5 cm. Phyllaries dark green to blackish, with long blackish stiff glandular hairs along midvein except in innermost ones and all ± with weak curly pale multicellular uniseriate hairs especially along margin and apically, apex acute; outer phyllaries rather few, linear-lanceolate, approaching inner ones in length; inner phyllaries many. Florets pale purple. Achene brown, ca. 8 mm, with several ribs, apex long attenuate and paler than remainder. Pappus yellowish, ca. 8 mm. Fl. and fr. Jul–Sep.


Herbs 40–60 cm tall, perennial, with a taproot. Stem erect, glabrous, apically sparsely branched, leafy. Leaves glabrous. Basal and lower stem leaves oblanceolate to obovate, 20–24 × 6–8 cm, sinuate-dentate to pinnatifid with triangular lobes, glabrous, basally attenuate to an auriculately clasping base, margin sparsely mucronulate-dentate, apex acute to acuminate. Middle stem leaves similar to lower stem leaves but smaller and rather more sinuate-dentate than shallowly pinnatifid, less attenuate toward base and broadly auriculately clasping. Synflorescence very laxly corymiform, with 2–4 capitula. Capitula nodding, with numerous florets; peduncle 7–22 cm, stout. Involucre broadly campanulate, 1.8–2 × 1.5–2 cm. Phyllaries abaxially dark green and glabrous, apex acute; outer phyllaries ovate to triangular-ovate, largest 4–6 × 2–3 mm; inner phyllaries with margin and apex shortly brownish fimbriate. Florets blue to purple. Achene brownish, ca. 3.5 mm, apex truncate. Pappus yellowish to pale brownish, 9–10 mm. Fl. Jun–Jul.


Herbs to 7 cm tall, perennial, rosulate, acaulescent, with a taproot. Caudex short, ± subterranean, with 3–7 scapes. Rosette leaves oblanceolate to narrowly elliptic, 4–10(–12) × 1–3 cm, sinuate-dentate or lyrate pinnatifid to subpinnatisect; lateral lobes elliptic to triangular, gradually smaller toward leaf base, abaxially with dark brown multicellular uniseriate hairs on veins, adaxially glabrous, margin entire or very scarcely and shallowly mucronulate-dentate; terminal lobe ovate to triangular, apex rounded, acute, or shortly acuminate. Scapes sometimes with 1 or 2 linear bracts, with dense long dark brown stiff glandular hairs. Capitula erect, with 10–16 florets. Involucre narrowly campanulate, 1.5–1.8 × 0.7–1 cm. Phyllaries abaxially brownish purple and with deep brown long stiff glandular hairs on midvein; outer phyllaries narrowly triangular to linear-lanceolate, approaching inner ones closely in length, apex acute to obtuse; inner phyllaries 8–10. Florets blue to bluish purple. Achene brown to dark brown, 4.5–6.5 mm, with 5 main ribs, apex truncate. Pappus brown, 1–1.2 cm. Fl. and fr. Jul–Sep.


Dubyaea grandis Handel-Mazzetti.

Herbs to 10 cm tall, perennial, with a taproot. Caudex short, ± subterranean, with 1 scape and sometimes with 1 lanceolate bract. Rosette leaves narrowly elliptic to oblanceolate, 3–9 × 0.5–0.7 cm, glabrous, base attenuate into a petiole-like portion, margin
Herbs, annual or perennial, acaulescent and rosulate, or, exceptionally, acaulescent with thick and hollow, densely leafy stem, sometimes from thin, vertical, subterranean shoot with scaly leaves. Rosette shoot inflated at apex to a flat, convex, hollow receptacle, carrying usually some to numerous, densely crowded sessile or subsessile capitula, often with a reduced, linear subtending leaf. Capitula with 3 or 5 florets. Involucre narrowly cylindric. Phyllaries in 1 row; outer phyllaries absent; inner phyllaries 3 or 5, ± lanceolate, subequal in length, connate in basal part, hardened at maturity. Receptacle naked. Florets yellow or pale to medium purple. Involucre narrowly campanulate, 1.1–1.3 × 1–1.5 cm. Phyllaries blackish green, with a ciliate margin especially apically otherwise glabrous; outer phyllaries ovate to lanceolate, largest 8–10 × 3–4 mm; inner phyllaries many, 3–5 mm wide, apex acute to obtuse. Florets reddish mauve to bluish purple. Achene not seen when mature, glabrous, with ca. 8 ribs, apex truncate. Pappus brownish, 8–10 mm.


合头菊属 he tou ju shu

Shi Zhu (石铸 Shih Chu); Norbert Kilian

Herbs, perennials. Caudex subglobose. Stem to 1 m tall, glabrous or apically sparsely hairy. Basal leaves unknown. Lower and middle stem leaves with margin coarsely mucronate to sinuate-dentate; terminal lobe to 15 × 12 cm, basally cor- date to shortly cuneate then contracted into an unwinged petiole-like rachis to 7 cm with apically 1 or 2 pairs of elliptic to obovate lateral lobes 1–3 × 0.5–2 cm, apex acute. Upper stem leaves similar to middle stem leaves but gradually smaller and without lateral lobes. Synflorescence corymbiform, with 1–4 capitula. Capitula nodding, with numerous florets; peduncle 12–22 cm, apically pubescent. Involucre campanulate, 1.3–1.5 × 1–1.5 cm. Phyllaries blackish green, with a ciliate margin especially apically otherwise glabrous; outer phyllaries ovate to lanceolate, largest 8–10 × 3–4 mm; inner phyllaries many, 3–5 mm wide, apex acute to obtuse. Florets reddish mauve to bluish purple. Achene not seen when mature, glabrous, with ca. 8 ribs, apex truncate. Pappus brownish, 8–10 mm.

1b. Capitula with 3 florets; phyllaries 3 or 4; florets purplish.

1a. Capitula with 5 florets; phyllaries 5; florets yellow.

2a. Leaf blade narrowly obovate to narrowly oblancoceolate; florets with ligule ca. 3 mm ........................................ 1. S. disciforme

2b. Leaf blade orbicular or ovate; florets with ligule 8–9 mm ........................................................................... 2. S. chrysocephalum


盘状合头菊 pan zhuang he tou ju


Herbs 2–5 cm tall, perennial, rosulate, acaulescent. Taproot slender. Rosette leaves narrowly obovate to oblancoceolate, 2–5 × 0.4–1.5 cm, green or particularly on rachis tinged purplish red, sinuate-dentate to pinnately lobed with toothlike lobes, ± pilose, base attenuate into a basally widened petiole-like portion. Synflorescence flat conical, 2–7 cm in diam., with some to numerous capitula. Capitula with 5 florets. Involucre narrowly cylindric, 10–12 × ca. 3 mm. Phyllaries 5, lanceolate, abaxially sparsely pilose on midvein, apex rounded to obtuse. Florets yellow, ligule ca. 3 mm. Achene brown, obconical, 3–4 mm, compressed, apex truncate. Pappus 6–8 mm. Fl. and fr. Sep–Oct. 2n = 16×.

• Alpine meadows, scree slopes, mountain slopes, gravelly areas; 3900–4800 m. Gansu, Qinghai, Sichuan.

Led astray by the collector’s note, Mattfeld described the species as having purple florets, although he stated that the corolla appears yellow in the type material. The erroneous color designation has since been repeated in the literature, but it is clear that the species in fact has yellow florets. Leaf incision varies even within a population from weakly sinuate-dentate to pinnately lobed. Therefore, no differences exist with

1b. Capitula with 3 florets; phyllaries 3 or 4; florets purplish.

Herbs 3–5 cm tall, perennial, rosulate, acaulescent. Taproot slender. Rosette leaves ovate to ovate-orbicular, 2–8 × 0.8–1.5 cm, green or tinged purplish red, glabrous or ± villous, base abruptly contracted into a basally widened winged or unwinged petiole-like portion with or without a few pairs of small lateral lobes, margin dentate, apex obtuse, acute, or rounded. Synflorescence flat conical, 2–3 cm in diam., with few to some capitula. Capitula with 3 florets. Involucre narrowly cylindric, 10–12 × ca. 3 mm. Phyllaries 5, lanceolate, abaxially sparsely pilose, apex rounded. Florets yellow, ligule 8–9 mm. Anthers 2.5–4 mm. Achene brown, obconical, ca. 3 mm, compressed, apex truncate. Pappus 6–7 mm. Fl. Jul. 2


Herbs 1–5 cm tall, perennial, rosulate, acaulescent to subacaulescent. Taproot slender. Rosette leaves petiolate; petiole 2–3 cm, wings sometimes dentate; leaf blade often dark purple, ovate, oblanceolate, or elliptic, 1.5–3 × 0.5–2 cm, undivided to basally lyrate, margin shallowly to coarsely dentate, apex rounded to obtuse. Synflorescence flat conical, 2–6 cm in diam., with some to numerous capitula. Capitula with 3 florets. Involucre narrowly cylindric, 7–9 × 2–3 mm. Phyllaries 3 or 4, lanceolate, abaxially glabrous or white villous, apex obtuse. Florets purple, ligule 5–7 mm. Anthers 2.5–4 mm. Achene brown, obconical, ca. 3 mm, compressed, apex truncate. Pappus 6–8 mm. Fl. and fr. Jun–Oct. 2n = 16*.


Herbs 1–5 cm tall, rosulate, acaulescent to subacaulescent. Taproot slender. Rosette leaves petiolate; petiole 2–3 cm, wings sometimes dentate; leaf blade often dark purple, ovate, oblanceolate, or elliptic, 1.5–3 × 0.5–2 cm, undivided to basally lyrate, margin shallowly to coarsely dentate, apex rounded to obtuse. Synflorescence flat conical, 2–6 cm in diam., with some to numerous capitula. Capitula with 3 florets. Involucre narrowly cylindric, 7–9 × 2–3 mm. Phyllaries 3 or 4, lanceolate, abaxially glabrous or white villous, apex obtuse. Florets purple, ligule 5–7 mm. Anthers 2.5–4 mm. Achene brown, obconical, ca. 3 mm, compressed, apex truncate. Pappus 6–8 mm. Fl. and fr. Jun–Oct. 2n = 16*.


Herbs, perennial, rosetulate and acaulescent or exceptionally caulescent with a thick hollow densely leafy stem to 20 cm tall. Taproot slender. Leaves glabrous; petiole to 1 cm, broadly winged; leaf blade obovate, elliptic, or ovate, 3–8 × 0.5–2.2 cm, base cuneate, margin coarsely dentate, apex rounded to obtuse. Leaves immediately below synflorescence somewhat smaller. Synflorescence flat conical, 5–6 cm in diam., with numerous capitula. Capitula with 3 florets. Involucre narrowly cylindric, 10–13 × ca. 3 mm. Phyllaries 3(4), lanceolate, abaxially glabrous, apex obtuse to rounded. Florets pale rose. Achene not seen when mature, brown, obconical, compressed, apex truncate. Pappus 8–9 mm. Fl. and fr. Aug.

340 CICHORIEAE


全光菊属 quan guang ju shu

Herbs, perennial, ± glabrous, with rhizomes. Stems well developed, erect, leafy. Basal and stem leaves linear-lanceolate, grass-like. Synflorescence laxly paniculiform to corymbiform, with few to many capitula. Capitula erect; peduncle wiry, few to some cm. Involucre cylindric. Phyllaries glabrous; outer phyllaries in several series, gradually longer centripetally, longest ca. 1/2 as long as inner ones; inner phyllaries ± linear-lanceolate, ± equal in length. Receptacle naked. Florets yellow. Achene blackish brown and straw-colored mottled, subcylindric to weakly angular, with 5 weak main ribs, secondary ribs indistinct, base attenuate, apex truncate. Pappus straw-colored, of scabrid brittle bristles.

About three species: E Asia; one species in China.

全光菊 quan guang ju


Herbs, perennial, rhizomatous. Stem 60–100 cm tall, erect, branched in upper half, leafy. Basal leaves few, present or absent at anthesis. Basal and lower stem leaves linear-lanceolate, usually 15–40 × 0.5–2(–3) cm, base ± expanded and semiamplexicaul, margin entire, apex acute to acuminate. Middle and upper stem leaves similar to basal leaves but gradually smaller upward on stem; uppermost stem leaves linear-subulate, reduced in size. Synflorescence paniculiform to paniculiform-corymbiform, usually with 10–25 capitula. Capitula with 20–25 florets; peduncle wiry, usually 0.5–3 cm. Involucre cylindric, 1–1.3 cm. Phyllaries with an obtuse apex; outer phyllaries ovate to broadly lanceolate, longest 5–6 mm; inner phyllaries 12–14, apically ciliate. Florets pale yellow. Achenes ca. 6 mm. Pappus ca. 7 mm, ± caducous. Fl. and fr. Jul.–Sep.

Meadows, marshy meadows, damp places near small streams; 700–2200 m. Heilongjiang, Jiangsu, Jilin, ?Liaoning, Nei Mongol, ?Shandong, Zhejiang [Japan, Korea, SE Russia].


耳菊属 er ju shu

Shi Zhu (石铸 Shih Chu); Norbert Kilian

Herbs, perennial. Stem erect, leafy. Synflorescence paniculiform, with many capitula. Capitula often nodding, with 5–25 florets. Involucre narrowly cylindric to narrowly campanulate. Phyllaries in few series; outer phyllaries gradually longer centripetally, to 1/2 as long as inner ones; inner phyllaries ± equal in length. Receptacle naked. Florets yellow, pale purplish, whitish, or greenish. Achene brownish, of scabrid brittle bristles.

About 15 species: E Asia, North America; two species in China.

The presence of Nabalus acerifolius Maximowicz in China, given by W. Wang and C. Y. Li (Fl. Pl. Herb. Chin. Bor.-Orient. 9: 419, 2004) under the name Prenanthes acerifolia (Maximowicz) Matsumura, appears most unlikely. The bluish white flowered species with palmately 3–7-lobed, long petiolate, mostly basal leaves, is otherwise endemic to Japan.

1a. Capitula with 20–25 florets; florets yellow; achene 7–8 mm

1b. Capitula with 5 florets; florets pale purplish, or whitish, or greenish; achene 3.5–4.5 mm


耳菊 er ju

Lactuca blinii H. Léveillé; L. ochroleuca (Maximowicz) Franchet; Prenanthes blinii (H. Léveillé) Kitagawa; P. maximowiczii Kirpicznikov, nom. illeg. superfl.; P. ochroleuca (Maximowicz) Hemsley.

Herbs to 90 cm tall, perennial, with thick rhizomes. Stem solitary, erect, branched in apical portion, with scaly dark brown and crisped hairs or glabrous. Lower and middle stem leaves petiolate; petiole to 26 cm, basally expanded and semi-amplexicaul, wing sinuate-dentate; leaf blade lyrate pinnatisect, adaxially usually with multicellular brown hairs, margin irregularly coarsely sinuate-dentate; leaf blade additionally with 1 pair of shallowly impressed teeth, apex acute to acuminate or leaf blade additionally with 1 pair of mucros. Base cordate, hastate, truncate, or cuneate, margin coarsely sinuate-dentate with mucronate teeth, and apex acute to acuminate or leaf blade additionally with 1 pair of mucros. The bluish white flowered species with palmately 3–7-lobed, long petiolate, mostly basal leaves, is otherwise endemic to Japan.


全光菊 quan guang ju


Herbs, perennial, rhizomatous. Stem 60–100 cm tall, erect, branched in upper half, leafy. Basal leaves few, present or absent at anthesis. Basal and lower stem leaves linear-lanceolate, usually 15–40 × 0.5–2(–3) cm, base ± expanded and semiamplexicaul, margin entire, apex acute to acuminate. Middle and upper stem leaves similar to basal leaves but gradually smaller upward on stem; uppermost stem leaves linear-subulate, reduced in size. Synflorescence paniculiform to paniculiform-corymbiform, usually with 10–25 capitula. Capitula with 20–25 florets; peduncle wiry, usually 0.5–3 cm. Involucre cylindric, 1–1.3 cm. Phyllaries with an obtuse apex; outer phyllaries ovate to broadly lanceolate, longest 5–6 mm; inner phyllaries 12–14, apically ciliate. Florets pale yellow. Achenes ca. 6 mm. Pappus ca. 7 mm, ± caducous. Fl. and fr. Jul.–Sep.

Meadows, marshy meadows, damp places near small streams; 700–2200 m. Heilongjiang, Jiangsu, Jilin, ?Liaoning, Nei Mongol, ?Shandong, Zhejiang [Japan, Korea, SE Russia].


耳菊属 er ju shu

Shi Zhu (石铸 Shih Chu); Norbert Kilian

Herbs, perennial. Stem erect, leafy. Synflorescence paniculiform, with many capitula. Capitula often nodding, with 5–25 florets. Involucre narrowly cylindric to narrowly campanulate. Phyllaries in few series; outer phyllaries gradually longer centripetally, to 1/2 as long as inner ones; inner phyllaries ± equal in length. Receptacle naked. Florets yellow, pale purplish, or whitish, or greenish. Achene brownish, of scabrid brittle bristles.

About 15 species: E Asia, North America; two species in China.

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1b. Capitula with 5 florets; florets pale purplish, or whitish, or greenish; achene 3.5–4.5 mm


耳菊 er ju

Lactuca blinii H. Léveillé; L. ochroleuca (Maximowicz) Franchet; Prenanthes blinii (H. Léveillé) Kitagawa; P. maximowiczii Kirpicznikov, nom. illeg. superfl.; P. ochroleuca (Maximowicz) Hemsley.

Herbs to 90 cm tall, perennial, with thick rhizomes. Stem solitary, erect, branched in apical portion, with scaly dark brown and crisped hairs or glabrous. Lower and middle stem leaves petiolate; petiole to 26 cm, basally expanded and semi-amplexicaul, wing sinuate-dentate; leaf blade lyrate pinnatisect, adaxially usually with multicellular brown hairs, margin irregularly coarsely sinuate-dentate; leaf blade additionally with 1 pair of shallowly impressed teeth, apex acute to acuminate or leaf blade additionally with 1 pair of mucros. Base cordate, hastate, truncate, or cuneate, margin coarsely sinuate-dentate with mucronate teeth, and apex acute to acuminate or leaf blade additionally with 1 pair of mucros. The bluish white flowered species with palmately 3–7-lobed, long petiolate, mostly basal leaves, is otherwise endemic to Japan.
nate teeth, apex acute to acuminate. Upper and uppermost stem leaves similar to middle stem leaves in division but smaller and broadly triangular-ovate, linear-lanceolate, subrhombic, broadly ovate, or ovate, base truncate to cuneate, apex shortly to long acuminate. Synflorescence paniculiform, with some to many capitula. Capitula pendent at anthesis, erect in fruit, with ca. 5 florets; peduncle capillaceous, shorter than involucrle, often densely pilose with multicellular hairs. Involucrle narrowly cylindric, 10–13 × 1.5–2.5 mm. Outer phyllaries few, ovate to triangular-ovate, longest 2–3 mm, apex acute to obtuse; inner phyllaries 5, linear-lanceolate to linear, ± with scarious margin abaxially often sparsely pilose, apex obtuse to rounded. Florets pale purple, pink, whitish, or greenish. Anther tube brownish purple. Achene brown, 3.5–4.5 mm, apex truncate. Pappus brown to brick-colored, 6–8 mm.

Mountain slopes, forests in mountain valleys, forest margins, forests, grasslands, moist places by water, moist places with thick grass; 500–3000 m. Gansu, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan [Korea, SE Russia].

Plants with ± deeply dissected terminal leaf lobe apparently occur in the central part of the distribution range of *Nabalus tatarinowii*, and they have been treated as a variety (*N. tatarinowii var. divisa*), sub-species (*Prenanthes tatarinowii* subsp. *macrantha*), or separate species (*P. macrophylla*). Stebbins (Contr. U.S. Natl. Herb. 28: 672. 1941) stated a correspondence of the pinnately lobed terminal leaf lobe with longer involucres (presumed to represent a tetraploid cytotype as inferred from pollen size). However, involucres to 1.3 cm also occur in plants with undivided terminal leaf lobes, and this corroborates Stebbins's summarizing statement that the species “consists of a complex of closely interrelated diploid and polyploid forms” (loc. cit.). Today, still little is known about geographical and altitudinal distribution, ecology, and infrapopulational and interpopulational variation in this complex. For the time being, therefore, two entities are distinguished tentatively delimited by their conspicuous leaf features and, following Stebbins (loc. cit.), treated at the rank of subspecies. *Prenanthes angustiloba* and *P. leptantha*, each described on the basis of a single specimen from Sichuan with dissected leaves and delimited from this species by minor and infrapopulational and interpopulational variation in this complex.

### 2a. *Nabalus tatarinowii* subsp. *tatarinowii*

*Nabalus tatarinowii* (Stebbins) N. Ki- lian, comb. nov.

**多裂耳菊**

**Pan guo ju (yuan ya zhong)**

*Basionym:* *Prenanthes tatarinowii* subsp. *macrantha* Stebbins, Contr. U.S. Natl. Herb. 28: 672. 1941; *Nabalus angustiloba* (C. Shih) Sennikov; *N. leptantha* (C. Shih) Sennikov; *N. tatarinowii* var. *divisa* Nakai & Kitagawa; *P. angustiloba* C. Shih; *P. leptantha* C. Shih; *P. macrophylla* Franchet; *P. tatarinowii* var. *divisa* (Nakai & Kitagawa) Kitagawa.

Lower and middle stem leaves with leaf blade either ovate to triangular-ovate, 5–15 × 6–15 cm, undivided, base cordate, hastate, truncate, or cuneate, margin subentire to sinuate-dentate with mucronate teeth, and apex acute to acuminate or leaf blade additionally with 1 pair of elliptic to obliquely ovate lateral lobes 0.6–5.5 × 0.4–4.5 cm. Upper and uppermost stem leaves with leaf blade broadly triangular-ovate, linear-lanceolate, subrhombic, broadly ovate, or ovate, similar to middle stem leaves but smaller and more frequently not divided, base truncate to cuneate, apex shortly to long acuminate. Fl. and fr. Aug–Oct. 2n = 16*.

Mountain slopes, forest margins, forests, grasslands, moist places by water; 500–3000 m. Gansu, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan [Korea, SE Russia].

### 2b. *Nabalus tatarinowii* subsp. *macrantha* (Stebbins) N. Kilian

*多裂耳菊*** duo lie er ju*

**Pan guo ju (yuan ya zhong)**

*Basionym:* *Prenanthes tatarinowii* subsp. *macrantha* Stebbins, Contr. U.S. Natl. Herb. 28: 672. 1941; *Nabalus angustiloba* (C. Shih) Sennikov; *N. leptantha* (C. Shih) Sennikov; *N. tatarinowii* var. *divisa* Nakai & Kitagawa; *P. angustiloba* C. Shih; *P. leptantha* C. Shih; *P. macrophylla* Franchet; *P. tatarinowii* var. *divisa* (Nakai & Kitagawa) Kitagawa.

Lower and middle stem leaves with leaf blade to 29 × 22 cm and divided; lateral lobes 1–3 pairs, elliptic, ovate, or lanceolate, much smaller than terminal lobe, margin subentire to coarsely sinuate-dentate with mucronate teeth, apex acute; terminal lobe broadly triangular-ovate, suborbicular, or broadly lanceolate in outline, pinnatipartite to pinnatisect with segments lanceolate, elliptic, or oblong-lanceolate, base cordate to cuneate, margin coarsely sinuate-dentate with mucronate teeth, apex acute to acuminate. Upper stem leaves similar to middle stem leaves but smaller and less divided; uppermost stem leaves elliptic, rhombic, or lanceolate, pinnatipartite or coarsely sinuate-dentate to entire, base cuneate, apex shortly acuminate to long acuminate. Fl. and fr. Jul–Oct.

Mountain slopes, forests in mountain valleys, moist places with thick grass; 1100–2700 m. Gansu, Hebei, Henan, Shaanxi, Shanxi, Sichuan.

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*绢毛菊属* **juan mao ju shu**

*Shi Zhu* (石铸 Shih Chu); Norbert Kilian

*Stebbinsia* Lipschitz; *Tibetoseris* Sennikov.

*Herbs, perennial, roslulate, often acaulescent, sometimes from a stout vertical subterranean rosette shoot with scalelike leaves*
1b. Rosette leaves and lower stem leaves (if any) spatulate, elliptic, or lanceolate and very gradually attenuate.

Phyllaries in few series; outer phyllaries mostly 2, linear, similar to uppermost leaves; inner phyllaries 4–15, ± lanceolate, subequal in length, connate or distinct in basal part, herbaceous at maturity. Receptacle naked. Florets yellow, sometimes basally blackish, more rarely white. Achene subcylindric, subfusiform, obcolunnar, or narrowly obconical, subcompressed, with 5 mostly rather slender and sometimes weak main ribs and 1–3(or 4) secondary often ± subequal ribs in between but otherwise smooth, inconspicuously or rarely apically conspicuously acutely papillate, apex ± truncate or rarely shortly beaked. Pappus whitish to straw-colored, often apically grayish, bristles stiff, coarse, scabrid, and usually ± caducous.

About seven species: Bhutan, W China, N India, Kashmir, Nepal, Pakistan; seven species in China.

Cytological and molecular work by J. W. Zhang et al. (Bot. J. Linn. Soc. 154: 79–87. 2007; Taxon 60: 15–26. 2011) confirmed the very close relationship between the monotypic genus *Soroseris* (accommodating *S. umbrela*) and *Soroseris*, and supports its unification with the latter. Further evidence comes from the molecular phylogenetic analysis of subtribe Cripidinae by J. W. Zhang et al. (in prep.) revealing that *Youngia depressa*, recently separated for convincing morphological reasons from *Youngia* (see also there, p. 252) in a new genus *Tibetoseris* (Sennikov & I. D. Illarionova, Komarovia 5: 96. 2008), which subsequently was, similarly convincingly, most recently recircumscribed to become a monotypic genus for *Y. depressa* by D. Maity & Maiti (Compositae Newsletter. 48: 22–42. 2010), actually is also nested in the clade of *Soroseris*. *Soroseris depressa*, in fact, well agrees morphologically; it strongly resembles *S. umbrela* in leaf shape and habit, while in the number of phyllaries it is intermediate between *S. umbrela* and the remainder of *Soroseris*. We therefore understand *Soroseris* in this wider sense, including both *Soroseris* and *Tibetoseris* s.s. As has been shown by J. W. Zhang et al. (Taxon 60: 15–26. 2011), speciation in *Soroseris* is rather recent, their relationship being not resolved in their molecular analyses. Also morphologically, distinction is not always easy, especially between *S. glomerata* and *S. hookeriana*, and more studies are needed.

1a. Rosette leaves orbicular to ovate and abruptly contracted into an unwinged petiole-like basal portion; involucre with 8–15 inner phyllaries; capitula with 15–30 florets.

2a. Rosette leaves mostly < 3 cm wide; involucre with 10–15 inner phyllaries; florets white; achene apex truncate ...

2b. Rosette leaves mostly > 3 cm wide; involucre with ca. 8 inner phyllaries; florets yellow; achene apex shortly beaked ...

3a. Synflorescence elongate and cylindric ................................................................. 7. *S. teres*

3b. Synflorescence hemispheric.

4a. Leaves pinnatifid to pinnatisect (rarely mostly entire and only few of them pinnately lobed); leaf rosette present; achene usually with an attenuate apex; pappus (0.7–)0.9–1.5 cm ................. 6. *S. hookeriana*

4b. Leaves undivided and entire to coarsely dentate; leaf rosette present or not; achene usually with a truncate apex; pappus 0.7–1.1 cm.

5a. Scalelike leaves (cataphylls) in basal portion below well-developed leaves missing or very few; well-developed leaves usually along an aerial stem (to 30 cm tall); leaf margin entire and flat or undulate ................................................................. 5. *S. erysimoides*

5b. Scalelike leaves (cataphylls) in subterranean or basal portion below leaf rosette usually some to many; well-developed leaves usually rosulate; leaf margin entire to remotely dentate or coarsely dentate.

6a. Leaf margin entire or remotely denticulate; involucre 1–1.5 cm ..................................... 3. *S. glomerata*

6b. Leaf margin coarsely dentate; involucre 0.7–0.9 cm ................................................. 4. *S. pumila*


肉菊 rou ju

*Crepis umbrela* Franchet, J. Bot. (Morot) 9: 255. 1895; *Stebbinsia umbrela* (Franchet) Lipschitz.

Herbs 3–15 cm tall, perennial, rosulate. Taproot ramose or simple. Rosette shoot with conspicuous subterranean portion with cataphylls. Cataphylls below rosette leaves numerous, ovate to lanceolate but higher up also linear, 1–3 × 0.3–1 cm, apex acute. Above-ground leaves in a ± dense leaf rosette, often purplish red; petiole-like basal portion 4–18 cm, sometimes winged and apically pinnately lobed, sparsely brownish yellow pilose; bladelike portion orbicular, ovate, or ovate-elliptic, 2–15 × (1.5–)13–11 cm, glabrous to ± pilose, base shallowly cordate to cuneate, margin mucronately dentate and sinuate-dentate, apex rounded. Synflorescence umbelliform to corymbiform, with some to many capitula. Capitula with 15–30 florets; peduncle of 1.5–8 cm, thick, ± pilose. Involucre campanulate, 1.4–2 × 0.8–1.5 cm. Phyllaries dark green to blackish; outer phyllaries few, linear, approaching inner ones in length, mostly pilose; inner phyllaries 10–15, abaxially or on midvein pilose, apex acute to obtuse. Florets white. Achene some shade of brown, columnar to obcolumnar, 4–6 mm, weakly ribbed, between main ribs usually with ca. 3 often inconspicuous secondary ribs, apex truncate. Pappus whitish, ca. 1 cm. Fl. and fr. Jul–Sep. 2n = 16n.

Alpine meadows, scree slopes; 2600–4600 m. Sichuan, Xizang, Yunnan [Bhutan, India (Sikkim)].


矮生绢毛菊 ai sheng juan mao ju
Basionym: **Crepis depressa** J. D. Hooker & Thomson, Fl. Brit. India 3: 397. 1881; *Lactuca cooperi* J. Anthony; *L. pseudoumbrellula* D. Maity & Matti; *Tibetoseris depressa* (J. D. Hooker & Thomson) Sennikov; *Yongxia depressa* (J. D. Hooker & Thomson) Babcock & Stebbins.

Herbs 2–3 cm tall, perennial, rosulate, acaulescent, with a taproot. Cauldron woody. Rosette leaves with a basally gradually thickened petiole as long as or longer than blade; leaf blade obovate, broadly ovate, or deltoid, 1.5–4 × 1–3.5 cm, axially puberulent, base broadly cuneate to rounded, margin subentire to sinuate-dentate, apex obtuse, rounded, or acute. Synflorescence subumbellate to hemispheric, 3–5 cm in diam., with numerous closely crowded capitula. Capitula with 15–20 florets; peduncle usually 0.5–2 cm. Involucre green or purplish red, cylindrical, 1.3–1.6 cm. Phyllaries ± setose along midvein; outer phyllaries several, linear-lanceolate, 3–4 mm, almost equal in length, apex acute; inner phyllaries ca. 8, midvein subapically often faintly crested, margin ± scarious, apex obtuse to acute. Florets yellow. Anther tube blackish with usually a single somewhat more slender secondary rib, apically acutely papillate, apex attenuate into a yellowish beak. Pappus white, 9–10 mm. Fl. and fr. Aug–Sep. 2n = 16.

Grasslands on mountain slopes, alpine meadows; 3200–4500 m. Xizang [Bhutan, India (Sikkim), Nepal].

A subspecies with pinnatisect leaves and shorter achene and pappus described from India (Sikkim) and Nepal (as *Tibetoseris depressa* subsp. *gauri* D. Maity, Candollea 65: 213. 2010) is so far not known to occur in China.


絨毛菊 ai xiao juan mao ju

*Prenanthes glomerata* Decaisne in Jacquemont, Voy. Inde 4(Bot.); 99. 1843; *Crepis gilii* S. Moore var. *bellidifolia* Handel-Mazzetti; *C. glomerata* (Decaisne) Bentham & J. D. Hooker; *C. rosularis* Diels; *C. sorophalata* Hemsl.; *Lactuca deasyi* S. Moore; *Soroseris bellidifolia* (Handel-Mazzetti) Stebbins; *S. deasyi* (S. Moore) Stebbins; *S. rosularis* (Diels) Stebbins.

Herbs, perennial, rosulate. Taproot ramose or not ramose. Rosette shoot with conspicuous subterranean portion with cataphylls. Cataphylls below leaf rosette numerous, ovate, long ovate, or narrowly lanceolate, 7–15 × 3–5 mm, apex acute. Above-ground leaves in a dense to loose rosette, with 4 or 5 florets; peduncle 2–15 mm. Involucre narrowly cylindrical, 10–15 × 2–3 mm. Outer phyllaries linear, shorter or longer than inner ones, ca. 1 mm wide, pilose; inner phyllaries 4 or 5, pilose or rarely glabrous, apex obtuse, acute, or rounded. Florets yellow or rarely white. Anther tube yellowish, reddish, or blackish. Style yellowish, greenish, or blackish. Achene brown, narrowly obconical, 5–8 mm, subequally ribbed and between main ribs usually with 3 or 4 secondary ribs, apex ± truncate. Pappus whitish or straw-colored and grayish apically, 7–11 mm. Fl. and fr. May–Sep. 2n = 16*, 32*.

Meadows, scree slopes; 3200–5600 m. Gansu, Qinghai, Sichuan, Xinjiang, Xizang, Yunnan [N India, Kashmir, Nepal, Pakistan]. *Soroseris glomerata* is here treated in a wider sense, rather representing a complex, and including three little-known entities, *Soroseris bellidifolia*, *S. deasyi*, and *S. rosularis*. Variation, distribution, and delimitation of taxa (probably most appropriately on subspecies rank) in this complex are insufficiently known at present and in need of revision.


矮小絨毛菊 ai xiao juan mao ju

Herbs, perennial, rosulate, with a taproot. Rosette shoot with conspicuous subterranean portion with cataphylls. Cataphylls below rosette leaves several to many, ovate to narrowly lanceolate and higher up linear, apex acute. Above-ground leaves in a dense rosette, often abaxially purplish, with a 1–5 cm petiole; leaf blade spatulate, 0.5–2.5 × 0.3–1 cm, ± pilose, base cuneate, margin coarsely dentate to shallowly pinnatifid, apex obtuse. Synflorescence flat to hemispheric, with numerous closely crowded capitula. Capitula with 4 florets; peduncle 2–10 mm. Involucre narrowly cylindrical, 7–9 × 3–4 mm. Outer phyllaries ca. 2, linear, slightly longer than inner ones, pilose; inner phyllaries 4, apex obtuse to subacute. Florets yellow. Anther tube and style blackish. Achene brown, subfusiform, 3.5–4.5 mm. Pappus whitish to straw-colored and grayish apically, 8–10 mm.

Scree slopes; 4300–4900 m. S Xizang (Yadong) [Bhutan, India (Sikkim)].


空桶参 kong tong shen


Herbs, perennial, usually conspicuously caulescent, usually without scalelike leaves above root. Taproot long. Stem solitary, 5–30 cm tall, 1–2 cm in diam., erect, hollow, leafy. Leaves oblong-lanceolate, lanceolate, elliptic, or linear, 2–11 × 0.2–1.5 cm, base long attenuate, margin entire and flat or undulate, apex obtuse to rounded; upper leaves on stem similar but gradually smaller, glabrous or ± pilose; uppermost leaves on stem subdenticulate and on peduncles reduced in size, almost linear, 15–20 × < 1 mm, glabrous to pilose. Synflorescence hemispheric, with numerous closely crowded capitula. Capitula with 4 florets; peduncle usually shorter than capitulum. Involucre narrowly cylindrical, 7–12 × 2–3 mm. Phyllaries olive to dark green, glabrous or sparsely pilose; outer phyllaries ca. 2, similar to uppermost reduced leaves, mostly ± as long as to longer than inner ones; inner phyllaries 4. Florets yellow. Anther tube and style blackish. Achene brown, subfusiform to obcolumbar, 4–6 mm, subequally ribbed and between main ribs...
usually with 2 or 3 secondary ribs. Pappus whitish to straw-colored and grayish apically, 7–11 mm. Fl. and fr. Jun–Oct. 2n = 16*.

Alpine thickets, meadows, scree slopes; 3000–3500 m. Gansu, Qinghai, Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, India (Sikkim), Nepal].

The entire plant is used medicinally mainly for treating fractures.

Soroseris erysimoides is the most widespread and common species of the genus in China. It shares the conspicuously developed leafy stem with the following two species.


皱叶绢毛菊 zhou ye juan mao ju

Crepis hookeriana C. B. Clarke, Compos. Ind. 255. 1876, not Ball (1873); C. gillii S. Moore; C. gillii var. hirsuta J. Anthony; C. trichocarpa Franchet; Soroseris gillii (S. Moore) Stebbins; S. gillii subsp. handeli Stebbins; S. gillii subsp. occidentalis Stebbins; S. hirsuta (J. Anthony) C. Shih; S. occidentalis (Stebbins) Tzvelev; S. trichocarpa (Franchet) C. Shih.

Herbs, perennial, with a long taproot, usually without cataphylls above root, caulescent and rosulate to conspicuously caulescent with a solitary stem. Stem (if present) to 10–20 cm tall, erect, hollow, distally glabrous or white to brownish pilose, leafy. Leaves lanceolate to ob lanceolate, 2–9 × 0.3–2 cm, shallowly pinnatifid to runcinately pinnatisect or very rarely most leaves undivided, glabrous to pilose, base long attenuate into a ± winged or unwinged petiole-like portion, margin flat or undulate, apex acute to acutish, lobes ± triangular, margin entire or sparsely dentate, apex acute; upper leaves on stem gradually smaller, mostly ± pilose; uppermost leaves on stem subtending capitula and on peduncles reduced, linear, pilose or more rarely glabrous, margin entire. Synflorescence ± hemispheric, with numerous closely crowded capitula. Capitula with 4 florets. Peduncle usually shorter than capitulum. Involucre narrowly cylindric, (8–)10–15(–17) × 2–3 mm. Phyllaries usually dark green, mostly pilose; outer phyllaries ca. 2, similar to uppermost reduced leaves, mostly ± as long as to longer than inner phyllaries; inner phyllaries 4, glabrous or abaxially pilose along midvein. Florets yellow, sometimes with blackish corolla tube and ligule base. Anther tube and style blackish. Achene cylindrical to subfusiform, to 5 mm, subequally ribbed and between main ribs usually with 1 or 2( or 3) secondary ribs, often shortly acutely papillose, base attenuate, apex shorter or longer attenuate. Pappus whitish to straw-colored and mostly ± grayish apically, (0.7–)0.9–1.5 cm. Fl. and fr. Jul–Aug. 2n = 16*.

Alpine meadows, scree slopes, rocky slopes, alpine thickets, rock crevices in glacial streams; 2800–5500 m. Gansu, Qinghai, Sichuan, Xizang, Yunnan [Bhutan, N India, Nepal].

Stebbins (Mem. Torrey Bot. Club 19(3): 41. 1940) has already stated that delimitation between Soroseris hookeriana and S. gillii is problematic and may need reconsideration. It still can be agreed with Stebbins that delimitation of his former S. hookeriana subsp. erysimoides (now treated as a separate species S. erysimoides) from both the typical subspecies and S. gillii appears sound. On the basis of the richer material meanwhile available, Stebbins’s delimitation of S. gillii (the correct name of which would actually be S. trichocarpa) from S. hookeriana subsp. hookeriana, however, fails, as does his infraspecific classification of the variation, mainly in the size of the involucres and in the indumentum, within S. gillii. Actually S. gillii and S. hookeriana belong to the same complex, widespread in W China, the subdivision of which (probably most appropriately at subspecies level) is in need of revision. Also included is S. hirsuta, based on Crepis gillii var. hirsuta, which separates the pilose plants of this complex and seems particularly artificial. For the time being, it appears at least a pragmatic solution to treat this complex as a single species.


柱序绢毛菊 zhu xiu juan mao ju

Herbs, perennial, conspicuously caulescent, without cataphylls above root. Taproot long. Stem solitary, 10–33 cm tall, 1–2 cm in diam., erect, hollow, leafy. Leaves narrowly elliptic, 4–13 × 1.5–3.5 cm, pinnatifid to pinnatisect, glabrous or sparsely pilose, lobes ± triangular; upper stem leaves similar but gradually smaller and densely pilose. Synflorescence cylindric, elongate, to 13 cm, with numerous densely crowded capitula. Capitula with 4 florets. Peduncle < 10 mm. Involucre narrowly cylindric, 10–11 × 2–3 mm. Phyllaries dark green, densely pilose; outer phyllaries 2, linear, ca. 10 × 0.5 mm, yellow pilose; inner phyllaries 4, brown villous, apex obtuse. Florets yellow. Anther tube and style blackish. Achene cylindric to subfusiform, ca. 5 mm, subequally ribbed and between main ribs usually with 3 or 4 secondary ribs, apex truncate. Pappus whitish but grayish apically, 0.9–1.1 cm. Fl. and fr. Jul–Sep. 2n = 16*.

Alpine meadows, thickets; 3900–4300 m. S Xizang (Yadong) [Bhutan].


猫儿菊属 mao er ju shu

Shi Zhu (石铸 Shih Chu); Norbert Kilian

Achyrophorus Scopoli; Trommsdorffia Bernhardi.

Herbs, perennial or rarely annual, often rosulate, usually with rigid simple hairs. Stems solitary to few [or sometimes acaulescent], usually sparsely branched or more rarely simple, leafless or sparsely leafy. Synflorescence single-headed or weakly corymbiform with few to several capitula. Heads with ca. 20 to many florets. Involucre cylindric, narrowly campanulate, or broadly hemispheric. Phyllaries ± glabrous or hispid; outer phyllaries in several series, gradually longer centripetally, ± imbricate, often ca. 3/4 or more as long as inner ones; inner phyllaries ± linear-lanceolate to linear, ± equal in length. Receptacle with linear scarious scales ± as long as involucre and enclosing base of florets. Florets yellow or white. Achene mostly rather long, homomorphic or dimorphic; body cylindric to fusiform, with 5 muricate main ribs, with or without secondary ribs, with or more rarely without a
slender to capillaceous beak often longer than body. Pappus white or dirty white, with all bristles stiffly fimbriately plumose or inner ones plumose and outer ones scabrid.

About 60 species: Asia, Mediterranean region, South America; six species (four introduced) in China.

1a. Pappus of two series of bristles with inner ones plumose and outer ones scabrid.
   1b. Pappus of one series of plumose bristles.

1. Hypochaeris maculata (Linnaeus) Bernhardi.

   Herbs 20–60 cm tall, annual, rosulate. Stems 1 or few, ascending to erect, simple or apically sparsely branched, glabrous, leafless or with few triangular-ovate bracts. Rosette leaves obovate to oblanceolate, 3–5 × 0.5–1.5 cm, subglabrous to hispidulous, base narrowly ± truncate and ± auriculately cuneate, apex obtusely rounded to acute. Stem leaf or leaves if any narrowly lanceolate to lanceolate, smaller than rosette leaves otherwise similar. Capitula 1–3, terminal, long pedunculate, with many florets. Involucre broadly campanulate to hemispheric, 1.5–2.5 × 1.5–2.5 cm. Phyllaries with ciliate margin and sparsely arachnoid hairy; outer phyllaries ovate to broadly lanceolate, conspicuously imbricate; inner phyllaries lanceolate. Florets yellow, slightly longer than involucre. Achene to 2 cm; body pale brown, ± fusiform, with 5 ribs, rugose, apically attenuate into a slender beak as long as or slightly longer than body. Pappus 7–12 mm, all bristles plumose. Fl. and fr. Jun–Aug. 2n = 10, 20.


   Arnica ciliata Thunberg in Murray, Syst. Veg., ed. 14, 768. 1784; Achyrophorus aurantiacus Candolle; A. ciliatus (Thunberg) Schultz Bipontinus; A. grandiflorus (Ledebour) Ledebour; Hypochaeris grandiflora Ledebour; Trommsdorffia ciliata (Thunberg) Sojak.

   Herbs 20–60 cm tall, perennial, with a taproot. Stem erect, simple, glabrous or entirely or only basal half covered with rigid bristles, leafy, base with dark brown residue of old leaf bases. Basal leaves rosulate, elliptic, narrowly elliptic, or oblanceolate, 9–20 × 2–2.5 cm, scabrid, attenuate into winged petirole-like basal portion of 2–5 cm, margin ± sharply dentate, apex acute to rounded. Lower stem leaves similar to basal leaves; middle and upper stem leaves sessile, elliptic to ovate, smaller, ± sparsely arachnoid hairy, basally ± truncate and ± auriculately cuneate, margin finely dentate, otherwise similar to lower leaves. Capitulum solitary, terminal on stem, with many florets. Involucre broadly campanulate to hemispheric, 1.5–2.5 × 1.5–2.5 cm. Phyllaries with ciliate margin and sparsely arachnoid hairy; outer phyllaries ovate to broadly lanceolate, conspicuously imbricate; inner phyllaries lanceolate. Florets golden yellow. Achene pale brown, cylindrical, ca. 8 mm, with 15 ribs, apex slightly attenuate and truncate. Pappus ca. 1.5 cm, all bristles plumose. Fl. and fr. Mar–Apr. 2n = 10.


   Argyranthemum glabrum (Linnaeus) Scopoli; Trommsdorffia glabra (Linnaeus) Bernhardi.

   Herbs 10–30 cm tall, perennial, rosetulate, with a taproot. Stem erect, simple or sparingly branched, hirsute, leafy, base with dark brown residue of old leaf bases. Rosette leaves subovate, lanceolate, elliptic, or oblanceolate, 9–20 × 2–2.5 cm, scabrid, attenuate into winged petirole-like basal portion of 2–5 cm, margin ± sharply dentate, apex acute to rounded. Lower stem leaves similar to basal leaves; middle and upper stem leaves sessile, elliptic to ovate, smaller, ± sparsely arachnoid hairy, basally ± truncate and ± auriculately cuneate, margin finely dentate, otherwise similar to lower leaves. Capitulum solitary, terminal on stem, with many florets. Involucre broadly campanulate to hemispheric, 1.5–2.5 × 1.5–2.5 cm. Phyllaries with ciliate margin and sparsely arachnoid hairy; outer phyllaries ovate to broadly lanceolate, conspicuously imbricate; inner phyllaries lanceolate. Florets yellow, slightly longer than involucre. Achene brown, domorphic; outer achenes cylindrical, 3–4 mm, ribbed, mucrate, truncate; inner achenes with fusiform body, 3–4 mm, ribbed, mucrate, beak capillaceous and as long as or longer than body. Pappus 7–8 mm, inner bristles plumose, outer bristles scabrid and shorter. Fl. and fr. Mar–Apr. 2n = 10.

Herbs 15–60 cm tall, perennial, rosetulate, with a taproot. Stems few to several, ascending to erect, simple or apically branched, leafless except for few to several bracts. Rosette leaves oblanceolate, (4)–8–15(–30) × 1–3(–7.5) cm, undivided or pinnatifid, base narrowly, margin sinuate-dentate, apex rounded to subacuete. Synflorescence sparsely corymiform, with few to several capitula. Capitula with rather many florets; peduncle long. Involucre cylindric to narrowly campanulate, 1–1.5 × 0.4–0.6 cm at anthesis, to 2 cm in fruit. Phyllaries minutely ciliate at apex and ± hispid on midrib or glabrous; outer phyllaries lanceolate, bluntly tipped; inner phyllaries linear-lanceolate. Florets bright yellow, much exceeding involucre. Achene brown; body fusiform, ca. 4 mm, ribbed and muricate; beak capillaceous, 4–5 mm. Pappus 7–8 mm, all bristles plumose. Fl and fr. Apr–May. 2n = 8.

Grassy areas of parks and urban areas, roadsides; near sea level to 200 m. Naturalized in N Taiwan [native to SE South America].

Hypochaeris albiflora has also been introduced to S Africa, E Australia, and SE North America.

This species was first recorded in 2005 and has spread since (M. J. Jung et al., Taiwania 54: 391–398. 2009, as Hypochaeris microcephala var. albiflora). No material has been seen from Taiwan by the present authors. The description is based on the publication by the above authors and supplemented with material from outside the area.


学名 猫儿菊 菊 hua mao er ju

Apargia chillensis Kunth in Humboldt et al., Nov. Gen. Sp. 4, ed. f°: 2. 1818; Achyrophorus brasiliensis (Lessing) Schultz Bipontinus; A. chillensis (Kunth) Schultz Bipontinus; Hypochaeris brasiliensis (Lessing) Bentham & J. D. Hooker ex Grisebach; Porcellites brasiliensis Lessing.

Herbs 20–50(–?) cm tall, perennial, rosetulate, with a taproot. Stem erect, apically sparsely branched, glabrous or hirsute basally, leafy. Rosette leaves narrowly elliptic, lanceolate, or oblanceolate, 5–10(–?) × 1–2(–?) cm, undivided and margin coarsely sinuate-dentate and ciliate or pinnatifid with triangular to lanceolate lobes, abaxially sparsely pubescent on midrib, adaxially glabrous, base narrow, apex acute to acuminate. Stem leaves few, smaller, narrower, undivided, base ± clasping, otherwise similar to rosette leaves. Synflorescence corymiform, with few to several capitula. Capitula with many (> 50) florets; peduncle long. Involucre cylindric to narrowly campanulate, 0.9–1.2 × 0.4–0.6 cm at anthesis, 1.5–1.8 cm in fruit. Phyllaries hirsute; outer phyllaries lanceolate to linear-lanceolate; inner phyllaries linear-lanceolate. Florets yellow, slightly longer than involucre. Achene brown; body fusiform, 4–5 mm, ribbed and muricate; beak capillaceous, 4–5 mm. Pappus 4–7 mm, all bristles plumose. Fl and fr. Jun–Jul. 2n = 8.

Roadsides; 500–600 m. Naturalized in N Taiwan [native to SE South America].

Hypochaeris chillensis has also been introduced to S Africa and SE North America.

This species was first recorded in 2009 (M. J. Jung et al., Taiwania 55: 412–416. 2010). No material has been seen from Taiwan by the present authors. The description is based on the publication by the above authors and supplemented with material from outside the area.

82. PICRIS Linnaeus, Sp. Pl. 2: 792. 1753.

毛连菜属 mao lian cai shu

Shi Zhu (石著 Shih Chu); Norbert Kilian

Deckera Schultz Bipontinus; Hagioseris Boissier; Medicusia Moench; Spitzelia Schultz Bipontinus.

Herbs, annual or perennial, rosetulate or not, with rigid 2–[-4]-hooked or more rarely simple hairs. Stem solitary, usually branched,
rarely stems few, low, and weak. Synflorescence corymbiform but sometimes weakly so. Capitula with usually 20–50 florets. Involucre campanulate to urceolate. Phyllaries ± glabrous or hispid; outer phyllaries in several series, gradually longer centripetally, ± imbricate, mostly 1/2–2/3 as long as inner ones; inner phyllaries ± linear-lanceolate to linear, ± equal in length. Receptacle naked. Florets yellow. Achene ± homomorphic; body fusiform to narrowly ellipsoid, often somewhat curved, with 5 faintly secondarily ribbed main ribs, transversely wrinkled, apically truncate or contracted into a short beak sculptured as body (= cuspis). Pappus white or dirty white, of stiffly fimbriately plumose bristles, often outermost bristles shorter and ± scabrid [in marginal achene sometimes reduced to a minute crownlike structure].

About 50 species: Africa, Asia, Australia, Europe; seven species (four endemic) in China.

Picris has a primary center of diversity including SW Asia and the Mediterranean region and a secondary center in Australia (S. Holzapfel, Wildenowia 24: 97–218. 1994). In C, E, and S Asia the genus is in urgent need of a modern revision, especially with respect to the complex of *P. hieracioides*, which poses particular problems because of it being anthropogenically spread. For the time being, *P. hieracioides* is treated here, in contrast to S. Kitamura (Acta Phytotax. Geobot. 8: 123–127. 1939; Mem. Coll. Sci. Kyoto Imp. Univ., Ser. B, Biol. 22: 90–98. 1955) and, e.g., Fl. Taiwan (ed. 2, 4: 1032. 1998), in a narrow sense, with *P. japonica* as well as the two taxa endemic to Taiwan kept as separate species. This solution has been chosen for the sake of consistency, because including the Taiwan endemics as subspecies in *P. hieracioides* while keeping *P. japonica* separate, as in FRPS (80(1): 54–55. 1997), would imply an unintended taxonomic decision on the relationships of the Taiwan endemics. Moreover, the actual presence of *P. hieracioides* s.s. in E and S Asia and the delimitation between *P. japonica* and *P. hieracioides* need thorough reassessment, and the currently available distributional data are to be taken with caution.

### 1. Picris japonica

*Thunberg in Murray, Syst. Veg., ed. 14, 711. 1784.*

**Japanese** 菊菜 切大戟

*ASTER esquisiolii* H. Léveillé; *Picris davurica* Fischer ex Hornemann; *P. davurica* var. *koreana* (Kitamura) Kitagawa ex Kitamura; *P. hieracioides* Linnaeus subsp. *japonica* (Thunberg) Krylov; *P. hieracioides* subsp. *koreana* (Kitamura) Voroschilov; *P. japonica* var. *koreana* Kitamura; *P. koreana* (Kitamura) Voroschilov; *P. mairei* H. Léveillé.

Herbs 30–120 cm tall, short-lived perennial, with a tap-root. Stem erect, branched mostly apically, hisurate with dark green to blackish rigid 2-hooked hairs, leafy. Basal leaves (withered at anthesis) and lower stem leaves ob lanceolate, elliptic-lanceolate, or elliptic-ob lanceolate, 12–20 × 1–3 cm, both surfaces with rigid 2-hooked hairs, basally attenuate into a petiole-like portion, margin sharply dentate to sinuate-dentate, apex acute to acuminate. Middle stem leaves sessile, lanceolate, base semiamplexicaul, smaller but otherwise like lower stem leaves. Upper stem leaves linear-lanceolate. Synflorescence corymbiform to panicleately corymbiform, with many capitula. Peduncle slender, hisurate like stem and branches. Involucre cylindric-campanulate to ovoid, 1–1.2 cm. Phyllaries green to blackish green, abaxially darkish to dark hisurate with 2-hooked hairs mainly along midrib, apex acute to acuminate; outer and inner phyllaries linear-lanceolate. Florets yellow. Achene reddish brown, fusiform, 3–5 mm, apex truncate. Pappus ca. 7 mm, caducous. 2n = 10*.

Grasslands on mountain slopes, forests, open places in forests, waste places in forests, by fields, river margins, alpine meadows; 600–3700 m. Anhui, Guangxi, Guizhou, Hebei, Heilongiang, Henan, Jilin, Liaoning, Nei Mongol, Qingshai, Shanxi, Shandong, Shanshi, Sichuan, Xinjiang, Xizang [Japan, Kazakhstan, Mongolia, E Russia].

According to V. N. Vassiljev (Fl. URSS 29: 221–222. 1964), *Picris japonica* can, moreover, be distinguished from *P. hieracioides* by the ligule of the corolla being less than 2 × as long as the tube, whereas it is 2–3 × as long as the tube in the latter species.

### 2. Picris hieracioides

*Linnaeus, Sp. Pl. 2: 792. 1753.*

**Japanese** 菊菜 野連菜

*Hedynopsis hieracioides* (Linnaeus) Hudson; *Picris hieracioides* subsp. *tsukouensis* Kitamura.

Herbs 16–120 cm tall, annual or short-lived perennial. Taproot stout. Stem erect, branched especially in apical third, hisurate with spreading rigid 2-hooked hairs, leafy. Basal leaves (withered before flowering) and lower stem leaves narrowly elliptic to broadly lanceolate, 8–20 × 2–4 cm, adaxially and especially on veins with spreading rigid 2-hooked hairs, base attenuate into a winged petiole-like portion, margin entire to coarsely and sharply dentate, apex acuminate, acute, or obtuse. Middle and upper stem leaves sessile, lanceolate to linear,
smaller, base semiamplexicaul to clasping, margin less dentate or entire, otherwise similar to lower stem leaves. Synflorescence corymbose to corymbosepaniculiform, with some to many capitula. Peduncle slender. Involucre cylindric-campanulate to ovoid, 0.9–1.2 cm. Phyllaries abaxially with whitish rigid 2-hooked hairs along midrib; outer and inner phyllaries ± linear-lanceolate, apex acute to acuminate. Florets yellow. Achene brown, fusiform, 3–5 mm, apex truncate. Pappus 5–6 mm, caducous. Fl. and fr. Jun–Oct. 2n = 10.

Grasslands, mountain slopes, forests, along ditches, fields, wastelands, sandy soils; 200–3600 m. Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jilin, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Yunnan [Bhutan, N India, Kashmir, Kazakhstan, W Russia, Vietnam; SW Asia, Europe, Mediterranean region].

*Picris hieracioides* has also been introduced to SE Africa and North America.

Delimitation between *Picris hieracioides*, *P. japonica*, and other Asian species of the genus needs urgent revision, even with respect to the actual presence of this species in China; see also note to the genus, above. Hence, the above data are to be taken with caution. See also the note under *P. japonica*. Presence in China and the status of *P. hieracioides* subsp. *kaimaensis* Kitamura, said to occur in the Himalaya as well as in NE Asia (Korea, Mongolia), need evaluation in the context of a revision of the *P. hieracioides* complex in E Asia.


台湾毛连菜 tai wan mao lian cai

*Picris hieracioides* Linnaeus subsp. *morrisonensis* (Hayata) Kitamura.

Herbs 20–70 cm tall, perennial, erect, with a taproot. Stem mostly solitary, erect, branched especially apically, hirsute with spreading rigid 2-hooked hairs, leafy. Basal and lower stem leaves narrowly elliptic to narrowly lanceolate, 6–16 × 0.5–0.8(–1.1) cm, hirsute with spreading rigid 2-hooked hairs, base attenuate, margin coarsely to shallowly sinuate-dentate, apex acuminate. Middle and upper stem leaves smaller than lower and basal stem leaves, otherwise similar, narrowly lanceolate to linear-lanceolate, base truncate, apex obtuse to acuminate. Synflorescence loosely corymbose, with several to many capitula. Peduncle usually 3–7 cm, slender, hirsute at stem and branches. Involucre cylindric-campanulate to ovoid, 1.5–1.7 cm. Phyllaries abaxially with whitish green rigid 2-hooked hairs along midrib; outer phyllaries blackish green, linear-lanceolate, unequal, apex acute to acuminate; inner phyllaries green, linear-lanceolate, apex acute to acuminate. Florets yellow. Achene reddish brown, fusiform, 5–6 mm, apex contracted into a ca. 0.5 mm cusp. Pappus 7–8 mm, caducous. Fl. Apr–Sep. 2n = 10*.


滇苦菜 dian ku cai

*Hypochoeris mairei* H. Léveillé.

Herbs 10–40 cm tall, short-lived perennial. Stems few to several, weak, erect, divaricately branched from base, with whitish rigid small 2-hooked hairs, glabrescent or glabrous toward apex. Basal leaves oblong-lanceolate to elliptic, narrowly elliptic, or linear-elliptic, 3–10 × 0.5–2 cm, with short rigid simple and hooked rigid hairs especially on midvein, basally attenuate into a winged petiole-like portion, base cuneate-attenuate, margin sinuate-dentate or entire, apex acute, obtuse, or rounded. Stem leaves few, subbasal, sessile, broadly linear to narrowly elliptic-ob lanceolate, small, with sparse simple rigid hairs especially on abaxial midvein, base semiamplexicaul, otherwise like basal leaves. Capitula 1 or 2 per stem. Involucre cylindric to narrowly campanulate, 9–10 mm. Phyllaries arachnoid hairy and with sparse rigid hooked hairs on midvein; outer phyllaries narrowly triangular to lanceolate, apex acute; inner phyllaries linear-lanceolate, apex acute. Florets yellow. Achene reddish brown, narrowly ellipsoid, 4–5 mm, apex contracted into a tiny cuspis. Pappus 6–7 mm. Fl. and fr. Apr–Nov. 2n = 10*.

Grasslands on mountain slopes, forest margins, thickets; 1400–3200 m. Xizang, Yunnan.


新疆毛连菜 xin jianga mao lian cai

*Picris afghanica* K. H. Rechinger & Kőic; *P. hieracioides* Linnaeus var. *indica* Candolle; *P. hieracioides* subsp. *nuristanica* (Bornmüller) Kitamura; *P. nuristanica* var. *indica* (Candolle) Tzvelev; *P. similis* V. N. Vassiljev.

Herbs (10–)30–100 cm tall, annual or short-lived perennial. Stem erect, branched especially in apical portion, leafy; branches spreading-erect, ± densely covered with whitish 2-hooked hairs. Basal leaves narrowly oblong-elliptic to lanceolate, 8–12 × 1.5–2 cm, both surfaces with whitish rigid 2-hooked hairs, basally attenuate into a winged petiole-like portion, margin entire or sinuate-dentate, apex acuminate. Lower leaves lanceolate to oblanceolate, 3–9 × 0.5–2 cm, both surfaces hirsute, basally attenuate into a winged petiole-like portion, margin irregularly sinuate-dentate, apex obtuse to acute. Stem leaves similar to rosette leaves but somewhat smaller and basally truncate; upper stem leaves reduced to linear-lanceolate bracts. Synflorescence loosely corymbose, with few to several capitula. Peduncle usually 3–6 cm, slender, hirsute as stem and branches. Involucre cylindric-campanulate to ovoid, 1.5–1.7 cm. Phyllaries abaxially with whitish green rigid 2-hooked hairs along midrib; outer phyllaries blackish green, linear-lanceolate, unequal, apex acute to acuminate; inner phyllaries green, linear-lanceolate, apex acute to acuminate. Florets yellow. Achene reddish brown, fusiform, 5–6 mm, apex contracted into a ca. 0.5 mm cusp. Pappus 7–8 mm, caducous. Fl. Apr–Sep. 2n = 10*.

Subalpine open stony or rocky places; above 3400 m. Taiwan (Daguan Shan, Nanhu Dashan).


黄毛毛连菜 huang mao mao lian cai

*Picris hieracioides* Linnaeus subsp. *ohwiana* (Kitamura) Kitamura.

Herbs 7–20 cm tall, perennial, rosulate, with a taproot. Stem divaricately branched from base, hirsute with yellowish green rigid 2-hooked hairs, leafless to sparsely leafy. Rosette leaves lanceolate to oblanceolate, 3–9 × 0.5–2 cm, both surfaces hirsute, basally attenuate into a winged petiole-like portion, margin irregularly sinuate-dentate, apex obtuse to acute. Stem leaves similar to rosette leaves but somewhat smaller and basally truncate; upper stem leaves reduced to linear-lanceolate bracts. Synflorescence loosely corymbose, with few to several capitula. Peduncle usually 3–6 cm, slender, hirsute as stem and branches. Involucre cylindric-campanulate to ovoid, 1.5–1.7 cm. Phyllaries abaxially with whitish green rigid 2-hooked hairs along midrib; outer phyllaries blackish green, linear-lanceolate, unequal, apex acute to acuminate; inner phyllaries green, linear-lanceolate, apex acute to acuminate. Florets yellow. Achene reddish brown, fusiform, 5–6 mm, apex contracted into a ca. 0.5 mm cusp. Pappus 7–8 mm, caducous. Fl. Apr–Sep. 2n = 10*.

Mountain meadows, open sites in mountains; 1400–3500 m. Taiwan.
stem leaves sessile, otherwise similar to basal leaves; middle and upper stem leaves linear-lanceolate, margin ± entire. Synflorescence sparsely corymbiform, with few to some capitula. Involucrè cylindric to narrowly campanulate, 1.5–1.7 cm. Phyllaries dark green, arachnoid hairy and with whitish rigid 2-hooked hairs; outer phyllaries small; inner phyllaries linear-lanceolate, margin membranous. Florets yellow. Achene fusiform, 5–6 mm, apex contracted into a ca. 0.3 mm cuspis. Pappus ca. 6 mm, caducous. Fl. and fr. Jun–Sep. 2n = 10.

Rocky mountain slopes, sandy areas on floodplains; 1600–1700 m. Xinjiang [Afghanistan, Kashmir, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan].


Picris hieracioides Linnaeus subsp. fuscipilosa Handel-Mazzetti.


菊苣属 ju ju shu

Shi Zhu (石铸 Shih Chu); Norbert Kilian

Acanthophyton Lessing.

Herbs, perennial, [biennial or annual]. Stem usually solitary, branched in lower half. Involucrè cylindric, hardened in fruit. Phyllaries in several series; outer phyllaries centripetally longer, imbricate; inner phyllaries in one row, equal in length. Receptacle naked. Florets bright blue. Achene subcylindric to obovoid, ± 3–5-angular, apex truncate. Pappus white, a tiny crown of fimbriate scales.

About seven species: N Africa, SW Asia, S Europe; one species (introduced) in China.

Two species, Cichorium endivia Linnaeus and C. intybus, are widely cultivated as a leafy vegetable in China; the latter is also widespread in China as a ruderal weed and in other temperate and semiarid regions of the world.


菊苣 ju ju

Herbs 40–110 cm tall, perennial, with a strong taproot. Stem usually solitary, erect; branches spreading-ascending, subglabrous. Basal leaves rosulate, obovate to oblanceolate, 15–34 × 2–4 cm, attenuate into a petiole-like basal portion, undivided to usually runcinately pinnatipartite, sparsely covered with long multicellular hairs, base attenuate, margin dentate; lateral lobes 3–6 pairs, triangular; terminal lobe distinctly larger than lateral ones, apex rounded to acute. Stem leaves similar to basal leaves but smaller and less divided, gradually reduced toward stem apex, base clasping, margin sparsely dentate to sinuate-dentate. Middle and upper stem leaves linear to linear-lanceolate, abaxially with simple rigid hairs, basally attenuate, margin sparsely dentate to sinuate-dentate. Middle and upper stem leaves similar to basal and lower stem leaves but smaller, lanceolate, basally truncate, wider, and clasping. Synflorescence sparsely corymbiform, with few to some capitula. Peduncle slender with dark long rigid simple hairs. Involucrè 1.5–1.7 cm. Phyllaries blackish green, with dark long simple hairs, margin cartilaginous; outer phyllaries linear to linear-lanceolate; inner phyllaries linear-lanceolate. Florets yellow. Achene fusiform, 4–5 mm, apex truncate. Pappus ca. 5 mm. Fl. and fr. Jun–Sep.

- Grasslands, mountain slopes, forests; 2000–3500 m. Yunnan.


山柳菊属 shan liu ju shu

Shi Zhu (石铸 Shih Chu); Günter Gottschlich

Herbs, perennial. Stem solitary to few fascicled, branched or unbranched. Leaves petiolate or sessile, margin entire, deeply ciliate; inner phyllaries linear-lanceolate. Florets blue or exceptionally pink or bluish white. Achene brown, subcylindric to obovoid, 2–3 mm, stout, rugulose, apex truncate. Pappus (0.1–)0.2–0.3 mm. Fl. May–Oct. 2n = 18.

By rivers, wastelands along seashores, slopes, by ditches; low elevations. ?Gansu, Hebei, Heilongjiang, Henan, ?Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Taiwan, Xinjiang [N Africa, C and SW Asia, Europe].

Escaped as a ruderal weed in many parts of the world, this species was formerly cultivated as a medicinal plant but more recently is grown as an ornamental and coffee substitute.

A second species, Cichorium pumilum Jacquin (as C. glandulosum Boissier & A. Huet) was reported for Xinjiang (Y. P. Gu & Y. S. Chen, Fl. Tsinling. 1(5): 391. 1985; C. H. An, Fl. Xinjiang. 5: 356. 1999). The presence of this Mediterranean–SW Asian species is highly unlikely, and, as also concluded by Tzvelev (Rast. Tsentral. Azii 14b: 1999). The description (“pappus scales ca. 0.1 mm”) refers to populations within the range of variation of C. intybus (including C. glaucum Hoffmannsegg & Link; see also A. M. Kiers, Gorteria, Suppl. 5. 2000).
toothed, or rarely lobed. Basal leaves rosulate, withered at anthesis, or absent. Stem leaves few to numerous [or 1 or reduced and bractlike or absent]. Synflorescence corymbose, paniculiform, racemiform, or pseudocorymbose, sometimes capitulum solitary. Capitula with numerous florets. Involucre panampanate, or basally turbinate, (0.8–0.9–1.2[–2] cm. Phyllaries in several irregularly or regularly imbricate rows, linear-lanceolate. Florets yellow [or rarely white]. Achene cylindric, ellipsoid, or narrowly obconic, 2.5–5 mm, with 8–10–14 equal ribs apically confluent in an obscure ring, apex truncate. Pappus white, dirty white, dirty yellow, or pale yellowish brown, of scabrid bristles.

About 800 species (broad species concept) with over 5,000 apomictic taxa (described as microspecies or subspecies): N Africa, Asia, Europe, North and South America; six species (one endemic) in China.

_Hieracium hololeion_ has been shown by molecular phylogenetic analyses (see N. Kilian et al. in V. A. Funk et al., Syst. Evol. Biogeogr. Compos., 352–353. 2009) to be a member of subtribe Crepidae (see there under Hololeion). Also _Hieracium coreanum_, as was first stated by H. S. Pak (Fl. Coreana 7: 378. 1999) and Sennikov and I. D. Illarionova (Bot. Zhurn. 86(3): 37–59. 2001), is actually a member of subtribe Crepidae, belonging to _Crepis_.

1a. Basal and lower stem leaves absent at anthesis.

2a. Middle stem leaves lanceolate to narrowly linear, 0.5–2 cm wide, base cuneate

2b. Middle stem leaves mainly ovate, 1.5–5 cm wide, base rounded or cordate and amplexicaul.

3a. Base of stem leaves cordate and amplexicaul; leaves often with rigid simple hairs on margin

3b. Base of stem leaves rounded; leaves glabrous or with few rigid simple hairs on margin

1b. Basal leaves withered at anthesis or present in fruit.

4a. Basal leaves withered at anthesis; phyllaries abaxially with capitate stipitate glandular hairs

4b. Basal leaves present in fruit; phyllaries abaxially without or with capitate stipitate glandular hairs.

5a. Phyllaries abaxially with sparse stellate hairs to 0.3 mm and with moderate simple hairs

5b. Phyllaries abaxially with dense capitate stipitate glandular hairs to 1 mm but simple hairs lacking


山柳菊  shan liu ju

_Hieracium coronopifolium_ Bernhardi ex Hornemann; _H. sinense_ Vaniot; _H. umbellatum_ subsp. _coronopifolium_ (Bernhardi ex Hornemann) Fries; _H. umbellatum_ var. _coronopifolium_ (Bernhardi ex Hornemann) Komarov; _H. umbellatum_ var. _monoglicum_ Fries; _H. umbellatum_ f. _scabrum_ Komarov.


Herbs, perennial, 40–80[–120] cm tall, with thick rhizomes. Stem solitary to few fascicled, basally purple, stout, erect, glabrous or basally with sparse to moderate simple hairs, apically branched. Stem leaves (10–)25–40[–80], basal and lower stem leaves absent at anthesis. Middle stem leaves sessile, ovate, ovate-lanceolate, narrowly elliptic-lanceolate, or narrowly elliptic, 5–8 × 1.5–5 cm, glaucescent, abaxially pale green and distinctly reticulately veined, margin or only abaxial veins with dense to sparse ± setose simple hairs, base cordate and amplexicaul, margin entire or with sparse and sharp teeth, apex acute to shortly acuminate. Upper stem leaves similar to middle stem leaves but gradually smaller. Synflorescence shortly corymbose to long paniculiform, with (10–)15–50(–80) capitula. Peduncle glabrous. Involucre campanulate or basally turbinate, 0.9–1.1 cm. Phyllaries in few rows, green or dark green, abaxially glabrous, apex obtuse to acute; outer phyllaries lanceolate, linear, or broadly linear, ca. 3 × 1 mm, often recurved; middle phyllaries lanceolate, 4.5–8 × ca. 1.5 cm; inner phyllaries lanceolate, ca. 1.1 cm × 1 mm. Florets yellow. Achene blackish brown, cylindrical, ca. 3 mm, with 10 ribs. Pappus pale yellow, ca. 6 mm. Fl. and fr. Jun–Oct. 2n = 27, 36.

Grasslands, forests, thickets; 1700–2100 m. Xinjiang [India, Japan, Kazakhstan, Mongolia, Russia, Uzbekistan; SW Asia, Europe, North America].


_ Hieracium prostratum_ Candolle; _H. sabaudum_ Pallas.

Herbs, perennial, 40–80[–120] cm tall, with thick rhizomes. Stem solitary to few fascicled, basally purple, stout, erect, glabrous or basally with sparse to moderate simple hairs, apically branched. Stem leaves (10–)25–40[–80], basal and lower stem leaves absent at anthesis. Middle stem leaves sessile, ovate, ovate-lanceolate, narrowly elliptic-lanceolate, or narrowly elliptic, 5–8 × 1.5–5 cm, glaucescent, abaxially pale green and distinctly reticulately veined, margin or only abaxial veins with dense to sparse ± setose simple hairs, base cordate and amplexicaul, margin entire or with sparse and sharp teeth, apex acute to shortly acuminate. Upper stem leaves similar to middle stem leaves but gradually smaller. Synflorescence shortly corymbose to long paniculiform, with (10–)15–50(–80) capitula. Peduncle glabrous. Involucre campanulate or basally turbinate, 0.9–1.1 cm. Phyllaries in several rows, green or dark green, abaxially glabrous, apex obtuse to acute; outer phyllaries lanceolate, linear, or broadly linear, ca. 3 × 1 mm, often recurved; middle phyllaries lanceolate, 4.5–8 × ca. 1.5 cm; inner phyllaries lanceolate, ca. 1.1 cm × 1 mm. Florets yellow. Achene blackish brown, cylindrical, ca. 3 mm, with 10 ribs. Pappus pale yellow, ca. 6 mm. Fl. and fr. Jun–Oct. 2n = 27, 36.

Grasslands, forests, thickets; 1700–2100 m. Xinjiang [India, Japan, Kazakhstan, Mongolia, Russia, Uzbekistan; SW Asia, Europe, North America].

3. _Hieracium coreanum_ Komarov.
erect, branched apically, glabrous or basally with sparse to moderate simple hairs, apically and under capitula with sparse to moderate stellate hairs. Stem leaves (10–)25–50–(80), basal and lower stem leaves absent at anthesis. Middle stem leaves sessile, ovate-lanceolate to narrowly elliptic-lanceolate, 5–9 × 1.5–3 cm, subglaucescent, abaxially pale green and reticulately veined, margin or only abaxial veins with moderate to sparse simple hairs and sparse to moderate stellate hairs, base cordate to rounded, margin entire to deeply dentate, apex acute to shortly acuminate. Upper stem leaves similar to middle stem leaves but gradually smaller. Synflorescence corymbiform to long paniculiform, with (10–)15–50–(80) capitula. Involucre campanulate, (0.9–)1–1.2 cm. Phyllaries in few rows, green or dark green, abaxially with moderate stellate hairs, apex obtuse to acute; outer phyllaries lanceolate, linear, or broadly linear, 2–3 × ca. 1 mm; middle phyllaries lanceolate, 4–7 × ca. 1 mm; inner phyllaries lanceolate, 0.8–1.2 cm × ca. 1 mm. Florets yellow. Achene blackish brown, cylindric, ca. 3 mm, with 10 ribs. Pappus pale yellow, ca. 6 mm. Fl. and fr. Jun–Oct. 2n = 27, 36.

Crepis shawanensis C. Shih.

Herbs, perennial, 30–60 cm tall, with long rhizomes. Stem purplish red, erect, branched apically or rarely unbranched, basally densely villous, abaxially with arachnoid and minutely stellate hairs, under capitula with long simple hairs mixed with capitulate stipitate glandular hairs and minutely stellate hairs. Basal leaves present at anthesis; petiole winged; leaf blade elliptic to lanceolate, 6–16 × 1–6 cm, sparsely villous, base cuneate-attenuate, margin with sparse sharp teeth, entire, or subentire, apex acute to obtuse. Stem leaves few, similar to basal leaves. Lower stem leaves shortly petiolate or sessile; leaf blade basally cuneate-attenuate, subamplexicaul, or amplexicaul. Synflorescence corymbiform, with (1 or)2 to several capitula. Involucre campanulate, ca. 6 mm in diam. Phyllaries in 3 rows, dark green, abaxially with sparse simple hairs and few minute stellate hairs; outer phyllaries linear-lanceolate to broadly linear, ca. 3.5–0.5 mm; middle phyllaries linear-lanceolate, ca. 9 × 1.2 mm, apex acute to obtuse. Florets yellow. Achene purple to purplish black, cylindric, ca. 3.2 mm, with 10 ribs. Pappus dirty white, pale yellow, or brownish, ca. 6 mm. Fl. and fr. Jul–Aug. 2n = 18, 27.

Forests, open places in forests; 1600–2200 m. Xinjiang [Kazakhstan, Mongolia, SC Russia].


Hieracium morii var. tsugitakaense Mori; H. pinnense Kitamura.

Herbs, perennial, 10–35 cm tall. Stem simple or branched, erect, moderately to densely microglan- dular, basally densely pilose, upward moderately pilose. Basal leaves spatulate, 5–13 × 1–2 cm, pilose and microglan- dular, base narrowly attenuate into a winged petiole, margin mucronately serrate, apex obtuse and mucronulate. Stem leaves 8–15, gradually smaller toward stem apex, up to densely microglan- dular. Synflorescence racemiform, with 1–16 capitula. Involucre obconic-campanulate, 1.2–1.5 × 0.6–0.9 cm. Phyllaries in 2 or 3 rows; outer phyllaries abaxially densely covered with dark hispid glan- dular capitulate hairs to 1 mm; inner phyllaries linear, ca. 8 mm, abaxially glabrous. Achene cylindric, 2.5 × 0.8 mm, with conspicuous ribs. Pappus brownish, 3.5–5 mm.

● Alpine meadows. Taiwan.

The present authors have not seen the type nor any reliable ma- terial of this species, and the above description is taken from the original publication and from the treatment in Fl. Taiwan (ed. 2, 4: 990. 1998).


卵叶山柳菊 iuan ye shan liu ju

Herbs, perennial, 30–100 cm tall, with short and thick rhizomes. Stem solitary to few fascicled, erect, branched apically, basally brown long hirsute and apically under capitula glabrous or with capitulate stipitate glandular hairs mixed with stel- late hairs or sometimes mixed with simple hairs, glabrescent. Basal and lower stem leaves withered in fruit. Middle stem leaves sessile, ovate, ovate-lanceolate, elliptic-lanceolate, or narrowly elliptic, 4–9 × 1–3 cm, abaxially sparsely hirsute on veins, adaxially glabrous, base auriculate and semiamplexicaul, margin entire or minutely toothed and sparsely ciliate, apex acuminate. Upper stem leaves similar to middle stem leaves but gradually smaller. Synflorescence sparsely corymbose panicu- liform, with capitula moderate in number. Involucre campanu- late, ca. 1 cm. Phyllaries in 3 rows, dark green to ± dark green, abaxially usually with simple hairs on midvein intermixed with capitulate stipitate glandular hairs and stellate hairs; outer phyllaries linear-lanceolate, ca. 2 × 0.7 mm, apex acute to obtuse; middle phyllaries linear-lanceolate, ca. 4 × 1 mm, apex acute to obtuse; inner phyllaries broadly linear, ca. 1.1 cm × 1.2 mm, apex obtuse. Florets yellow. Achene dark brown, cylindric, ca. 4 mm, with 8–10 ribs, basally attenuate. Pappus dirty white, ca. 6 mm. Fl. and fr. Jul–Aug.

Open places in forests; 1700–2000 m. Xinjiang [Kazakhstan].

85. PILOSELLA Hill, Brit. Herb. 441. 1756.

细毛菊属 xi mao ju shu

Shi Zhu (石铸 Shih Chu); Günter Gottschlich

Herbs, perennial, rosetulate. Stem solitary to few fascicled, branched or unbranched. Rosette leaves sessile, rarely withered at anthesis, margin entire or rarely denticulate; stem leaves [absent or] few or [rarely] numerous. Synflorescence corymbiform [or pseudocymiform, sometimes capitula solitary]. Capitula with numerous florets. Involucre ovoid to hemispheric, [4–]6–10–[14] mm.
Phyllaries in several irregular rows, linear-lanceolate or rarely ovate-lanceolate. Florets yellow [rarely pale yellow or orangish red], sometimes outer ones red striped. Achene cylindric, ellipsoid, or narrowly obconic, 1–2–2.5 mm, with [8–10–14] equal apically distinct ribs not confluent in an obscure ring, apex truncate. Pappus white or dirty white, of scabrid bristles.

About 110 species (broad species concept) with ca. 700 apomictic or hybrid taxa: N Africa, Asia, Europe; two species in China.

1a. Stem with spreading bristles; involucre [9–]10–11 mm ................................................................. 1. *P. procera*

1b. Stem with appressed or upward-curved bristles; involucre 6–9 mm ................................................... 2. *P. echioides*


棕毛细毛菊 zong mao xi mao ju

*Hieracium procerum* Fries, Symb. Hieracium, 43: 1848; *H. persicum* Boissier.

Herbs, perennial, 20–60 cm tall, rhizomatous. Stem solitary to few fascicled, erect, branched apically, basally densely covered with light brown spreading bristles, apically bristles gradually sparser and intermixed with stellate hairs and capitula becoming white or yellowish pubescent, without capitulate stipitate glandular hairs. Leaves with light brown dense bristles and small stellate hairs. Basal leaves withered at anthesis. Stem leaves sessile, narrowly elliptic to lanceolate, 3–10 × 0.2–1.2 cm, apex acuminate. Upper stem leaves lanceolate. Synflorescence corymbiform, with many capitula. Involucre hemispheric, ca. [0.9–]1[–1.1] cm. Phyllaries in 3 or 4 rows, densely covered with stellate hairs and sparsely with long rigid and capitulate stipitate glandular hairs; outer phyllaries lanceolate, 3–4 mm, apex acute to subobtuse; inner phyllaries narrowly elliptic-lanceolate, 7–9 mm, apex acute to obtuse. Florets yellow. Achene dark brown, cylindric, ca. 2.2 mm, with 10 ribs. Pappus dirty white, ca. 7 mm. Fl. and fr. Jul–Aug. 2n = 36.

Dry mountain slopes; 1200–2500 m. Xinjiang [Kazakhstan, Uzbekistan; SW Asia].


刚毛细毛菊 gang mao xi mao ju

*Hieracium echioides* Lumnitzer, Fl. Poson. 348. 1791; *H. echioides* subsp. *asiaticum* Nägeli & Peter; *Pilosella asiatica* (Nägeli & Peter) Schljakov.

Herbs, perennial, 25–100 cm tall, with short rhizomes. Stem solitary to few fascicled, erect, branched apically, basally densely covered with appressed or upward-curved brown long bristles, apically bristles sparser and stellate hairs dense, under capitulum densely white pubescent. Basal leaves withered at anthesis. Lower stem leaves shortly petiolate; leaf blade lanceolate, linear-lanceolate, or narrowly elliptic-lanceolate, 4–16 × 0.5–2 cm, densely hirsute and stellate, base attenuate, apex acute to obtuse. Upper stem leaves sessile, lanceolate, gradually smaller, densely hirsute and stellate. Synflorescence corymbiform, with few to many capitula. Involucr ovoid to hemispheric, 6–9 mm. Phyllaries in 3 rows, brownish gray, abaxially densely pubescent and with or without sparse capitulate stipitate glandular hairs; outer phyllaries ovate-lanceolate, 3–5 mm, apex acuminate; inner phyllaries narrowly elliptic-lanceolate, apex acuminate. Florets yellow. Achene brown, narrowly cylindric, ca. 2.2 mm, with 10 ribs. Pappus dirty white, 4–5 mm. Fl. and fr. Jun–Sep. 2n = 18, 27, 36.

Desert steppes, dry valleys; ca. 2000 m. Xinjiang [Kazakhstan; C and E Europe].
2. Tribe ECHINOPEAE


One genus and ca. 120 species: Africa, Asia, Europe; 17 species (five endemic) in China.


Herbs, perennial or rarely annual. Stems erect, usually apically branched, mostly cobwebby to lanate or glandular hairy or both. Leaves spiny. Pseudocephalia usually solitary, terminal to stem and branches, rarely clustered, bracteate at base. Capitula deciduous, inserted on a globose secondary receptacle. Basal phyllaries grading into bristles; middle phyllaries keeled and distally with a ciliate margin, apex usually spiny; inner phyllaries often shorter, unarmed, distinct to completely connate. Corolla white, blue, or purple. Anthers bluish gray. Achene covered with long straight appressed hairs. Pappus scales distinct to connate, inserted directly on apical plate.

About 120 species: Africa, Asia, Europe; 17 species (five endemic) in China.

Echinops albicaulis Kamelin & Kirilov and E. chantaviscus Trautvetter have been reported from Xinjiang (G. M. Shen, Fl. Xinjiang. 5: 238, 241. 1999), but they are not included in the following treatment and key because no material from China has been seen by the present authors.

1a. Annuals; middle phyllaries abaxially cobwebby.

2a. Stems and branches yellowish, glabrous or with glandular hairs; leaves green, sparsely cobwebby and glandular hairy ................................................................. 16. *E. gmelinii*

2b. Stems and branches whitish to canescent, densely cobwebby to lanate; leaves grayish white, densely cobwebby to lanate ................................................................. 17. *E. nanus*

1b. Perennials; middle phyllaries glabrous or strigose but not abaxially cobwebby.

3a. Margin of pappus scales not strigose.

4a. Leaves linear to linear-lanceolate, undivided and with an entire margin, discolorous, abaxially grayish white, adaxially green and glabrous ......................................................... 14. *E. integrifolius*

4b. Leaves elliptic to oblanceolate, margin dentate to bipinnatifid, concolorous, cobwebby to lanate .............. 15. *E. humilis*

3b. Margin of pappus scales strigose.

5a. Leaves leathery.

6a. Outermost phyllaries 1/3–1/2 as long as involucre.

7a. Lower leaves lanceolate, undivided but toothed, adaxially glabrous and shiny ......................... 1. *E. coriophyllus*

7b. Leaves elliptic, elliptic-lanceolate, or oblong-lanceolate, pinnatipartite to bipinnatipartite, adaxially sparsely cobwebby ................................................................. 2. *E. przewalskyi*

6b. Outermost phyllaries 1/5–1/4 as long as involucre.

8a. Plants to 1.5 m tall; stems sparsely cobwebby, strigose, and with glandular hairs ...................... 4. *E. talassicus*

8b. Plants 0.2–0.6 m tall; stems cobwebby to lanate and strigose but lacking glandular hairs.

9a. Corolla lobes outside glabrous ............................................................................. 3. *E. ritro*

9b. Corolla lobes outside with a few hairs ........................................................................ 5. *E. tjanschanicus*

5b. Leaves ± thinly papery.

10a. Phyllaries abaxially strigose.

11a. Leaves adaxially glabrous or sparsely cobwebby ................................................................. 12. *E. trichocephalus*

11b. Leaves adaxially densely strigose ............................................................................. 13. *E. sphaerocephalus*

10b. Phyllaries abaxially glabrous.

12a. Stems glabrous to densely cobwebby in lower half but lacking bristles.

13a. Lobes of lower and middle cauline leaves densely spinulose ciliate ........................................ 6. *E. grijsii*

13b. Lobes of lower and middle cauline leaves entire or with irregular spiny teeth .................... 7. *E. davuricus*

12b. Stems cobwebby and beset with bristles in lower half.

14a. Leaves rough, adaxially sparsely strigose ........................................................................ 11. *E. setifer*
1. Echinops coriophyllus


截叶蓝刺头 jie ye lan ci tou

Herbs to 45 cm tall, perennial. Stem solitary, branched below middle, sparsely cobwebby. Leaves leathery, abaxially gray to grayish green and thinly cobwebby, adaxially green, glabrous, and shiny. Lower cauline leaves sessile, lanceolate, ca. 10.5 × 5.5 cm, base truncate, margin with spine-tipped teeth. Middle cauline leaves similar but gradually smaller upward. Uppermost cauline leaves lanceolate to elliptic. Pseudocephalia ca. 4 cm in diam. Capitula ca. 1.3 cm. Phyllaries 20 or 21, abaxially glabrous; outermost phyllaries oblongelliptic, ca. 5 mm, unequal in length, 1/3–1/2 as long as involucre, claw margin sparsely long ciliate, distal portion broadly elliptic, 0.8–1.3 cm, distal half of margin sparsely shortly appressed ciliate. Florets ca. 1.3 cm. Corolla blue, glabrous, tube ca. 5 mm. Achene ca. 6 mm, hairs yellowish. Pappus scales linear, to 2 mm, unequal in length, connate for up to proximal half. Fl. and fr. Jul.

- Mountain slopes. Jiangsu (Tongshan).

2. Echinops przewalskii


火烙草 huo lao cao

Herbs 15–40 cm tall, perennial. Stems solitary or tufted, unbranched or 1–3-branched, cobwebby to lanate. Leaves leathery, abaxially whitish to grayish white and densely cobwebby to thickly lanate, adaxially green and yellowish green and sparsely cobwebby, margin and apex spiny. Basal and lower cauline leaves shortly petiolate; leaf blade elliptic, elliptic-lanceolate, or oblongelliptic, 10–20 × 2–8 cm, bipinnatifid or subbipinnatisect, with 5–8 pairs of segments and a triangular ultimate lobe. Middle and upper cauline leaves sessile, gradually smaller upward, pinnatifid, semiamplexicaul. Pseudocephalia 1 to few, 4–5 cm in diam. Capitula 1.2–1.7 cm. Phyllaries 20 or 21, abaxially glabrous; outermost phyllaries oblongelliptic, 3–4 mm, 1/5–1/4 as long as involucre, distal portion broadly elliptic, cartilaginous, margin shortly ciliate, and apex acuminate; middle phyllaries elliptic to oblongelliptic, 1.3–1.5 cm, margin long patent ciliate in distal half, apex spinulose acuminate; inner phyllaries shorter. Corolla blue, tube gland-dotted outside. Achene ca. 5.5 mm, hairs brown. Pappus scales linear, ca. 1.2 mm, connate in proximal half. Fl. and fr. Jun–Aug. 2n = 30, 32.

Gravelly places on mountain slopes; 400–2400 m. N Xinjiang [Kazakhstan, Mongolia, Russia, Turkmenistan; SW Asia, Europe].

Several subspecies were described from the European part of the species range. The Chinese plants possibly belong to Echinops ritro subsp. ruthenicus (M. Bieberstein) Nyman (E. ruthenicus M. Bieberstein).

4. Echinops taillisicus


大蓝刺头 da lan ci tou

Herbs to 1.5 m tall, perennial. Stem solitary, grayish white, unbranched or branched up to twice, sparsely cobwebby to lanate and strigose, densely so under synflorescences. Leaves leathery, abaxially grayish white and densely cobwebby to thickly lanate, adaxially green and densely gland-dotted. Lower and middle cauline leaves shortly petiolate; leaf blade oblongelliptic, 15–20 × 2–8 cm, bipinnatifid; segments elliptic, with triangular, spiny, and spine-tipped teeth. Upper cauline leaves similar but sessile, gradually decreasing in size upward, semiamplexicaul. Pseudocephalia 1 to few, 4–5 cm in diam. Capitula 2–2.5 cm. Phyllaries few; outermost phyllaries narrowly oblongelliptic, 6–8 mm, unequal, ca. 1/4 as long as involucre, distal portion broadly elliptic and margin long ciliate;
middle phyllaries oblanceolate to narrowly elliptic, 0.8–2.5 cm, distal portion of margin shortly ciliate, apex spinulose acuminiate; inner phyllaries narrowly elliptic, ca. 1.2 cm, apex cleft and awned. Corolla blue, tube outside gland-dotted. Achene ca. 5 mm. Pappus scales ca. 1 mm, connate almost entirely. Fl. and fr. Jul–Sep.

Mountain slopes. Xinjiang (Tian Shan) [Kazakhstan].


天山蓝刺头  tian shan lan ci tou

Herbs 20–25 cm tall, perennial. Stems branched from base, sparingly to densely cobwebby to lanate. Leaves leathery, abaxially grayish white or white and densely cobwebby to thickly lanate, adaxially green, glabrous, and gland-dotted. Basal and lower cauline leaves shortly petiolate; leaf blade elliptic, 10–20 × 2–3 cm, pinnatifid or subpinnatisect; proximal segments transformed into spines; distal segments triangular-lanceolate to lanceolate, spiny. Middle and upper cauline leaves similar but sessile and gradually smaller upward, semiamplexicaul. Uppermost leaves narrowly elliptic to lanceolate, spiny toothed. Pseudocephalium solitary or paired, 3–4 cm in diam. Capitula 1.4–1.5 cm. Phyllaries 20–28; outermost phyllaries oblanceolate, 3–4 mm, unequal, 1/5–1/4 as long as involucre, distal portion brownish, broadly elliptic, cartilaginous, margin long ciliate, and apex shortly acuminate; middle phyllaries narrowly elliptic to lanceolate, 0.9–1.2 cm, distal half of margin long ciliate, abruptly constricted from middle into a spiny tip; inner phyllaries narrowly elliptic, ca. 1.3 cm, apex dentate. Corolla blue, tube outside gland-dotted, lobes abaxially with a few long hairs. Achene ca. 6.5 mm, hairs yellowish. Pappus scales linear, ca. 1 mm, unequal, connate at base. Fl. and fr. Jul–Sep.

Mountain slopes; ca. 2200 m. Xinjiang (Tian Shan) [Kazakhstan].


华东蓝刺头  hua dong lan ci tou

Echinops cathayanus Kitagawa.

Herbs 30–80 cm tall, perennial. Stem solitary, apically usually branched, densely and thickly cobwebby, with fibrous petiole remains at base. Leaves papery, abaxially whitish to grayish white and densely cobwebby to thickly lanate, adaxially green, glabrous, and not glandular. Basal and lower cauline leaves long petiolate; leaf blade ± narrowly elliptic, ovate, or ovate-lanceolate, 10–15 × 4–7 cm, pinnatifid; segments 4 or 5(–7) pairs, ovate-triangular to linear-elliptic, margin finely and densely ciliate. Middle cauline leaves similar but shortly petiolate or sessile. Pseudocephalium 1 to several, ca. 4 cm in diam. Capitula 1.5–2 cm. Phyllaries 24–28, glabrous, abaxially not gland-dotted; outermost phyllaries numerous, oblong-lanceolate, 7–8 mm, unequal, ca. 1/2 as long as involucre, claw margin long ciliate in proximal half, distal portion brown, broadly elliptic, and margin shortly ciliate; middle phyllaries narrowly elliptic, ca. 1.3 cm, distal portion gradually constricted from middle into a spiny tip and margin shortly ciliate; inner phyllaries narrowly elliptic, ca. 1.5 cm, apex dentate. Florets ca. 1 cm. Corolla white, tube outside gland-dotted. Achene ca. 1 cm, hairs brownish yellow. Pappus scales linear, ca. 3 mm, connate almost entirely. Fl. and fr. Jul–Oct. 2n = 32+2B*.

Grasslands; 100–800 m. Anhui, Fujian, Guangxi, Henan, Hubei, Jiangsu, Jiangxi, Shandong, Taiwan, Zhejiang.


驴欺口  lu qi kou

Echinops davuricus var. angustilobus Candolle; E. davuricus var. latilobus Candolle; E. latifolius Tausch; E. latifolius var. manshuricus (Kitagawa) C. Y. Li; E. manshuricus Kitagawa.

Herbs 30–60 cm tall, perennial. Stems grayish white, unbranched or with 1 or 2 short branches, with fibrous petiole remains at base, sparingly cobwebby to lanate or glabrous in lower part, densely cobwebby to thickly lanate below synflorescences. Leaves papery, abaxially grayish white and densely cobwebby to thickly lanate, adaxially green and glabrous or sparingly cobwebby. Basal and cauline leaves long petiolate; leaf blade ± narrowly elliptic to lanceolate-elliptic, 15–35 × 8–18 cm, bipinnatifid, semiamplexicaul; segments 4–8 pairs; lobes entire or with few triangular spiny teeth, apex long acuminate. Uppermost cauline leaves sessile, pinnately lobed or pinnatifid, semiamplexicaul. Pseudocephalium 1–3, 3–5.5 cm in diam. Capitula ca. 1.9 cm. Phyllaries 14–17, abaxially glabrous; outermost phyllaries scalelike, oblong-lanceolate, ca. 7 mm, ca. 2/5 as long as involucre, distal portion broadly rhombic to elliptic, margin long ciliate, and apex shortly acuminate; middle phyllaries oblong-lanceolate, 1–1.3 cm, margin sparsely shortly ciliate, abruptly constricted from maximum width into a long spiny tip; inner phyllaries narrowly elliptic, ca. 1.5 cm, distal portion of margin shortly ciliate, apex spinulose acuminate. Corolla blue, tube outside gland-dotted. Achene ca. 7 mm. Pappus scales linear, ca. 1.2 mm, proximal half connate. Fl. and fr. Jun–Sep.

Grasslands, open forests; 100–2200 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi [Mongolia, Russia].

Fischer’s “Echinops davuricus” of 1812, a nomen nudum, was published twice independently in the same year, by Hornemann with the spelling “davuricus” and by Treviranus (Ind. Sem. Hort. Bot. Wratisl., App. 1: 2. 1819) as “dahuricus.” We treat these two names as published simultaneously and give precedence to the former.


羽裂蓝刺头  yu lie lan ci tou

Herbs 50–100 cm tall, perennial. Stems grayish white, unbranched or apically with short branches, with fibrous petiole remains at base, lower half bristly and cobwebby to lanate, below synflorescences densely and thickly cobwebby to lanate. Leaves papery, abaxially whitish to grayish white and thickly cobwebby to densely lanate, adaxially green and usually glabrous. Basal and lower cauline leaves long petiolate; leaf blade elliptic, 25–30 × 8–13 cm, pinnatifid, base enlarged and semiamplexicaul; segments 5–8 pairs, elliptic to narrowly lan-
ceolate, on one side with 1 or more triangular spiny teeth. Middle and upper cauline leaves similar but sessile, pinnately lobed or pinnatifid, semiamplexicaul. Pseudocephalia 1–7, ca. 6 cm in diam. Capitula 1.9–2.1 cm. Phyllaries 18–22, abaxially glabrous; outermost phyllaries ob lanceolate, 7–8 mm, 1/3–2/5 as long as involucre, claw margin shortly cili ate, distal portion brown, rhombic to broadly elliptic, and margin shortly ciliate; middle phyllaries ob lanceolate to narrowly ob lanceolate-elliptic, 1.3–1.8 cm, margin shortly ciliate, abruptly constricted from maximum width into a spiny tip; inner phyllaries linear, ca. 1.5 cm. Corolla blue, tube outside gland-dotted in distal half. Achene ca. 6 mm, hairs yellowish. Pappus scales linear, ca. 2 mm, connate at base. Fl. and fr. Jul–Aug.

- Mountain slopes; 400–700 m. Hebei, Shanxi.


东北蓝刺头 dong bei lan ci tou

Herbs 1.5–2 m tall, perennial. Stem solitary, whitish to grayish white, unbranched or apically sparingly branched, sparsely cobwebby and densely strigose in lower half, densely cobwebby to thickly lanate below synflorescences. Leaves ± thinly papery, abaxially grayish white and densely cobwebby to thickly lanate, adaxially green and glabrous. Middle and upper cauline leaves long petiolate; leaf blade ob lanceolate, 16–18 × 4–6 cm, pinnatipartite or pinnatifid; proximal segments transformed into spines; distal segments 3 or 4 pairs, triangular to lanceolate, margin spiny ciliate or with triangular spiny teeth. Uppermost cauline leaves similar but smaller. Pseudocephalia 1–3, 5–6 cm in diam. Capitula 2–2.4 cm. Phyllaries ca. 23, abaxially glabrous; outermost phyllaries ob lanceolate, 5–6 mm, unequal, ca. 1/4 as long as involucre, claw margin long ciliate, distal portion brownish, rhombic, margin ciliate, and apex shortly acuminate; middle phyllaries ob lanceolate, 1.4–1.6 cm, margin shortly ciliate, constricted from maximum width into a spiny awn; inner phyllaries narrowly elliptic, apex dentate. Corolla blue, tube outside gland-dotted in distal half. Achene ca. 6 mm, hairs yellowish. Pappus scales linear, ca. 1.4 mm, connate at base. Fl. and fr. Jul–Aug.

Forest margins, moist grasslands, stony sunny slopes, river margins; 1300–1800 m. N Hebei, SW Heilongjiang, W Jilin, Liaoning, Nei Mongol, Shandong, Shanxi [Korea, Russia].


林生蓝刺头 lin sheng lan ci tou

Herbs 1.5–2 m tall, perennial. Stem solitary, whitish to grayish white, unbranched or apically sparingly branched, sparsely cobwebby and densely strigose in lower half, densely cobwebby to thickly lanate below synflorescences. Leaves ± thinly papery, abaxially grayish white and densely cobwebby to thickly lanate, adaxially green and glabrous. Middle and upper cauline leaves long petiolate; leaf blade ob lanceolate, 16–18 × 4–6 cm, pinnatipartite or pinnatifid; proximal segments transformed into spines; distal segments 3 or 4 pairs, triangular to lanceolate, margin spiny ciliate or with triangular spiny teeth. Uppermost cauline leaves similar but smaller. Pseudocephalia 1–3, 5–6 cm in diam. Capitula 2–2.4 cm. Phyllaries ca. 23, abaxially glabrous; outermost phyllaries ob lanceolate, 5–6 mm, unequal, ca. 1/4 as long as involucre, claw margin long ciliate, distal portion brownish, rhombic, margin ciliate, and apex shortly acuminate; middle phyllaries ob lanceolate, 1.4–1.6 cm, margin shortly ciliate, constricted from maximum width into a spiny awn; inner phyllaries narrowly elliptic, apex dentate. Corolla blue, tube outside gland-dotted in distal half. Achene ca. 6 mm, hairs yellowish. Pappus scales linear, ca. 1.4 mm, connate at base. Fl. and fr. Jul–Aug.

Herbs 1–1.5 m tall, perennial. Stem solitary, grayish white, unbranched or apically sparingly branched, sparsely cobwebby and strigose, densely cobwebby to lanate below synflorescences. Leaves papery, green to grayish green, concolorous, both surfaces glabrous or sparsely strigose. Middle and upper cauline leaves sessile, elliptic, lanceolate, or ovate, 7–16 × 4–9 cm, pinnatipartite; segments elliptic-lanceolate to triangular-lanceolate, with spiny teeth. Uppermost cauline leaves similar but smaller. Pseudocephalia 1 or 2, 3.5–7 cm in diam. Capitula 2–2.3 cm. Phyllaries 15–18; outermost phyllaries ob lanceolate to long spatulate, ca. 1 cm, ca. 1/2 as long as involucre, claw margin long ciliate, distal portion elliptic, abaxially sparsely strigose and gland-dotted, margin ciliate, and apex spinulose acu-
1.5–2 cm, abaxially strigose, apex aristate dentate. Corolla blue, tube apically gland-dotted. Achene ca. 7 mm, hairs yellow. Pap- 


Herbs 0.5–1.5 m tall, perennial. Stem solitary, branched, with dense long multicellular hairs and sparsely cobwebby. Leaves papery, abaxially grayish white, sparsely cobwebby to lanate, and with long multicellular hairs, adaxially green and densely strigose. Basal and lower cauline leaves petiolate; leaf blade broadly lanceolate, 15–24 × 5–10 cm, pinnatifid; segments 3–5 pairs, triangular to lanceolate, with spiny teeth and acuminate spiny apex. Upper cauline leaves sessile, gradually smaller upward. Pseudocephalium 1–3, 4–4.5 cm in diam. Phyllaries 14–18, outermost phyllaries narrowly ob lanceolate, ca. 1 cm, ca. 1/2 as long as involucre, claw margin long ciliate, distal portion brown, broadly elliptic, abaxially densely strigose and gland-dotted, margin long ciliate, and apex spinulose acuminate; middle phyllaries ob lanceolate to narrowly elliptic, ca. 1.2 cm, abaxially densely strigose, margin long ciliate; inner phyllaries lanceolate, abaxially densely strigose, apex dentate. Corolla blue to white, tube outside not gland-dotted or sparsely gland-dotted. Achene ca. 7 mm, hairs yellowish. Pappus scales linear, ca. 1.2 mm, connate at base. Fl. and fr. Aug.

Mountain slopes; ca. 3000 m. SW Xinjiang (Takorgan) [Kazakhstan, Mongolia, Russia].


Herbs 10–90 cm tall, annual. Stem solitary, yellowish, with patent branches in lower half, rarely unbranched, sparsely glandular hairy to glabrous. Leaves papery, green, concolorous, both surfaces sparsely cobwebby and glandular hairy. Lower cauline leaves sessile, linear to linear-lanceolate, 3–9 × ca. 0.5 cm, semiamplexicaul, margin with spiny teeth and spinulose. Middle and upper cauline leaves similar but gradually smaller upward. Pseudocephalium 1 to several, 2–3 cm in diam. Capitula 1.2–1.4 cm. Phyllaries 16–20; outermost phyllaries ob lanceolate to 1 cm, less than 1/2 as long as involucre, claw abaxially cobwebby at base, margin ciliate with cilia longest around middle, distal portion brown, broadly elliptic, abaxially densely strigose, and apex spinulose acumin ate; middle phyllaries ob lanceolate, ca. 1.3 cm, abaxially strigose and cobwebby at base, distal half of margin shortly ciliate, constricted from maximum width into a spiny tip; inner phyllaries narrowly elliptic, apex dentate. Corolla blue or white, tube not gland-dotted. Achene ca. 5 mm, hairs dark yellow. Pappus scales linear, ca. 1.2 mm, connate at base. Fl. and fr. Jun–Sep.

Gravelly places on mountain slopes, desert steppes, loess hills, flooded places; 500–3200 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Xinjiang [Mongolia, Russia (Tyva)].


Herbs 12–16 cm tall, annual. Stem solitary, whitish to grayish white, with ascending robust branches, densely cob-
webby to thickly lanate. Leaves thickly papery, subconcolorous, both surfaces densely cobwebby to thickly lanate. Lower cauline leaves shortly petiolate; leaf blade oblanceolate to linear-oblanceolate, 4–8 × 1–1.2 cm, pinnately lobed to pinnatifid; segments 2–4(or 5) pairs, narrowly ovate, triangular-lanceolate, or triangular, with sparse spiny teeth. Upper cauline leaves similar but gradually smaller upward. Pseudocephalia several, 2.5–3 cm in diam. Capitula ca. 1.3 cm. Phyllaries 12–14; outermost phyllaries linear, slightly shorter than involucre, abaxially strigose, claw margin long ciliate, distal portion slightly expanded, margin shortly ciliate, and apex spinulose acuminate; middle phyllaries narrowly elliptic, ca. 1 cm, abaxially cobwebby on proximal portion, margin shortly ciliate, apex densely strigose and spinulose acuminate; inner phyllaries narrowly elliptic, abaxially cobwebby, apex bidentate. Corolla blue, tube outside sparsely glandular hairy and gland-dotted. Achene ca. 5 mm. Pappus scales linear, ca. 1.3 mm, proximal half connate. Fl. and fr. Jun–Jul.

Deserts; 1300–1500 m. Xinjiang (Pamir, Tian Shan) [Kazakhstan, Mongolia, Russia, Uzbekistan].
15. Tribe EUPATORIEAE

泽兰族 ze lan zu

Chen Yilin (陈艺林 Chen Yi-ling); Takayuki Kawahara, D. J. Nicholas Hind

Herbs (rarely aquatic or semiaquatic), subshrubs, shrubs, climbers, small trees, sometimes epiphytic. Leaves usually opposite, rarely strictly alternate, sometimes rosulate or verticillate, sessile or petiolate, blade usually simple. Synflorescence usually a corymbose panicle, sometimes spicate. Capitula sessile or distinctly pedunculate, homogamous, discol, rarely with some sygynomorphic outer florets; involucr cylindric, campanulate, or hemispheric, rarely subtended by a subinvolucral bract; phyllaries in 1 to several series, few or numerous, imbricate, subimbricate, or distant, equal, subequal, or markedly graded, persistent or variously deciduous, lanceolate or ovate; receptacle flat to convex, sometimes highly conical, usually naked, glabrous or sometimes pubescent. Florets few, very rarely 1, often 4 or 5 to many, commonly fragrant; corollas funnelform to tubular, never truly yellow; lobes relatively short, commonly 5, very rarely 4; anther cylinders usually included within corolla tube; anther appendages obtuse or acute, rarely emarginate or lobed, as long as broad or shorter, sometimes absent, basal appendages short or almost absent, obtuse or rounded; anthropodia indistinct, cylindric or variously pronounced; nectary rarely visible; style base glabrous or pubescent, sometimes with a swollen node; styles usually very conspicuous and much exserted, glabrous or rarely pubescent; style branches linear to clavate, obtuse, stigmatic surfaces variously papillate. Achenes obvoid or obovate with phytomelan in achene walls, usually 3–5(or 10)-ribbed, body rarely flattened with 2 ribs or 5 winged ribs, sometimes glandular, glabrous or variously setuliferous; carpodium often paler than achene body, rarely indistinct or absent, of several layers of variously enlarged, sometimes ornamented cells, usually symmetrical, rarely eccentric, annular, cylindric, or stopper-shaped; pappus sometimes absent and reduced to an apical callus, rarely a laciniate crown, or vestigial, occasionally coroniform, usually of setae, commonly uniseriate, rarely biseriate or very rarely multiseriate, usually persistent, sometimes fragile, usually numerous, sometimes few, usually equal or subequal, rarely very short, or occasionally of flattened scales or awnlike scales, rarely of two distinct elements, very rarely of broad laciniate setae, or of few clavate apical appendages; setae commonly barbellate or laciniate, rarely plumose, apices acute or obtuse, usually gradually tapering, sometimes dilated, very rarely conspicuously narrowing.

About 180 genera and ca. 2,000 species: concentrated in Mexico and Central and South America, with relatively few native species in the Old World; several pantropical weeds widespread in the Old World; ten genera (seven introduced) and 25 species (six endemic, nine introduced) in China.

The tribe appears to be nearly restricted to the W Hemisphere, having a Neotropical origin. The subtribes show a mixed distribution pattern, with explosive speciation in several, especially those occurring in Brazil, the Caribbean, Colombia, and Mexico. There are many pantropical and pan-subtropical weeds in the tribe. Uses of members of the tribe have been briefly summarized by King and Robinson (Monogr. Syst. Bot. 22: 1–581. 1987). More recent references on the topic include S. Garg and T. C. S. Sastry (in P. D. S. Caligari & D. J. N. Hind, Compositae Biol. Util. 2: 361–382. 1996; Ageratum conyzoides, Mikania micrantha), Y. P. Huang and Y. R. Ling (in P. D. S. Caligari & D. J. N. Hind, loc. cit.: 431–451; Ageratum houstonianum, Adenostemma), M. Heinrich (in P. D. S. Caligari & D. J. N. Hind, loc. cit.: 475–503; 31 Mexican species), and J. Valles et al. (in P. D. S. Caligari & D. J. N. Hind, loc. cit.: 453–466; Eupatorium cannabinum). Sevilia rebaudiana (Bertoni) Hemsley, a native of Paraguay, is cultivated in China as the source of a strong sweetener and sugar substitute.


1a. Phyllaries and florets 4 per capitulum (subtribe Mikaniinae) ................................................................. 237. Mikania
1b. Phyllaries and florets not of equal number, or if florets 4 then phyllaries more numerous.

2a. Phyllaries distant, with non-articulate bases (subtribe Adenostemmatinae).
   3a. Pappus of 3–5 clavate glandular knobs ................................................................................. 238. Adenostemma
   3b. Pappus absent .................................................................................. 239. Gymnocronis

2b. Phyllaries imbricate or subimbricate, sometimes distant, bases always articulate.
   4a. Phyllaries all deciduous leaving a naked receptacle, remaining appressed until lost and not spreading with age (subtribe Praxelinae).
      5a. Receptacle flat to slightly convex .................................................................................... 244. Chromolaena
      5b. Receptacle conical ............................................................................................... 243. Praxelis
   4b. At least some basal phyllaries persistent, phyllaries usually spreading with age.
      6a. Pappus of scales or awns, rarely absent; receptacle paleaceous ........................................... 240. Ageratum
      6b. Pappus of capillary setae; receptacle epelate.
         7a. Style base pubescent (subtribe Eupatoriinae).
            8a. Carpodium scarcely differentiated; phyllaries green, sometimes with purplish apex, not evidently ribbed ..................................................................................... 241. Eupatorium
            8b. Carpodium prominent; phyllaries straw-colored, weakly ribbed ......................... 242. Austroeupatorium
         7b. Style base glabrous.
            9a. Receptacle conical; corollas usually blue; florets 50–70; carpodium obsolete .......... 245. Conoclinium
            9b. Receptacle slightly convex; corollas white; florets 10–60; carpodium distinct .......... 236. Ageratina

紫茎泽兰属 *zi jing ze lan shu*

Shrubs or perennial herbs, usually erect. Leaves usually opposite; blade narrowly elliptic to deltate, mostly toothed, lobed, serrate, or crenate. Capitula laxly to densely corymbose. Phyllaries ca. 30, 2- or 3-seriate, distant to weakly subimbricate, mostly subequal; receptacle usually slightly convex, glabrous or with minute scattered hairs. Florets 10–60, often sweetly scented; corollas white or lavender, usually with slender basal tube and campanulate limb (in *A. subg. Ageratina* and *A. subg. Klattelia*), others narrowly funnelform; lobes distinctly longer than wide, outer surface smooth, glabrous or glandular, usually with hairs (in *A. subg. Ageratina*), inner surface densely papillose; antheropodium cylindric, usually elongate; anther appendage large, ovate-oblong, longer than wide; style base usually enlarged [except in *A. subg. Apoda*]; style branches rarely slightly broadened distally, densely papillose with projecting cells on lateral and outer surfaces. Achenes prismatic or fusiform, usually 5-ribbed, setuliferous or glandular or both; carpodium distinct (cylindric in *A. subg. Ageratina*) [in others rounded or broadly stopper-shaped]; pappus setae uniseriate, 5–40, barbellate, often easily deciduous, capillary, often enlarged distally, often with outer series of shorter setulae. *x* = 17.

About 265 species: tropics and subtropics of the New World; one species (introduced) in China.


破坏草 *po huai cao*


Shrubs or perennial herbs, 30–90(–200) cm tall. Stems erect; branches opposite, obliquely ascending, white or ferrugineous puberulent, upper part and peduncles more densely so, glabrescent or glabrous in lower part by anthesis. Leaves opposite, long petiolate; blade abaxially pale, adaxially green, ovate, triangular-ovate, or rhombic-ovate, 3.5–7.5 × 1.5–3 cm, thin, both surfaces sparsely puberulent, more densely so abaxially and on veins, basally 3-veined, base truncate or slightly cordate, margin coarsely crenate, apex acute. Synflorescences terminal, corymbose or compound-corymbose, to 12 cm in diam. Capitula numerous, 2–4 cm, 40–50-flowered; involucrre broadly campanulate, ca. 3 × 4 mm; phyllaries 2-seriate, linear or linear-lanceolate, 3.5–5 mm, apex acute or acuminate; receptacle convex to conical; corollas purplish, tubular, ca. 3.5 mm. Achenes black-brown, narrowly elliptic, 1–1.5 mm, 5-angled, without hairs and glands; pappus setae 10, basally connate, white, fine, equal to corolla. Fl. and fr. Apr–Oct. **2n** = 51.

Wet places or roadsides on slopes, forest margins; 900–2200 m. Introduced and naturalized in Guangxi, Guizhou, Nanhai Zhudao, and Yunnan [native to Mexico; pantropical and pansubtropical invasive weed in Cambodia, India, Laos, Myanmar, Nepal, Indonesia, Philippines, Thailand, Vietnam; S Africa, America, Atlantic islands (Canary Islands), Australia, Pacific islands].

*Ageratina adenophora* was introduced into China in the middle of the 19th century. It is poisonous; oxen and horses have become ill and have sometimes died from consuming it.


假泽兰属 *jia ze lan shu*

*Carelia* Jussieu ex Cavanilles (1803), not Fabricius (1759), nor Lessing (1832); *Corynanthelium* Kunze; *Kaninia* Gardner; *Willoughbya* Necker ex Kuntze.

Plants usually woody vines, sometimes erect perennial herbs or shrubs, moderately branched, never rosulate. Leaves opposite or whorled, sessile to long petiolate; blade linear to broadly ovate, membranous to leathery, base narrow to cordate. Synflorescences terminal on stems or lateral branches, cymose or thyrsoid; capitula clustered, sessile to pedunculate, with subinvolute bract; phyllaries distant, 4, subequal, persistent; receptacle flat, epealeate. Florets 4; corollas white or pink, funnelform or with variously campanulate limb, with or without distinct basal tube, glabrous to pilosulous or glandular on outer surface, with or without papillae on inside of throat or lobes; lobes broadly triangular to narrowly oblong; anther appendages as long as or longer than wide; style base thick, without distinct basal node, glabrous or sometimes papillose; style branches narrowly linear, not broadened at apex, scarcely to strongly papillose. Achenes prismatic, 4–10-ribbed; carpodium broadly cylindric; pappus setae numerous, persistent, capillary-like, apical cells obtuse to acute.

About 430 species: pantropical, mainly in Brazil; two species (one introduced) in China.


1a. Leaves, phyllaries, and corollas eglandular; phyllaries 5–7 mm; corollas narrowly campanulate; pappus usually rather reddish .................................................................................................................................................................. 1. *M. cordata*
1b. Leaves, phyllaries, and corollas with pale glands; phyllaries ca. 3.5 mm; corollas broadly campanulate; pappus off-white, never reddish .............................................................. 2. *M. micrantha*


假泽兰 *xia tian ju*

_Eupatorium cordatum_ N. L. Burman, Fl. Indica, 176. 1768; _Mikania volubilis_ Willdenow.

Herbs, perennial, climbing. Stems slender, many branched, sparingly or densely pubescent or subglabrous. Median leaves: petiole 2.5–6 cm; blade triangular-ovate, 4–10 × 2–7 cm, both surfaces sparingly or densely pubescent, glabrescent or glabrous by anthesis, base cordate, margin entire or repand-crenate; upper leaves gradually smaller, shortly petiolate, triangular or lanceolate, base truncate or cuneate. Capitula numerous in terminal corymb or compound corymb; peduncle slender, pubescent or glabrous, with linear-lanceolate bracteole leaves; phyllaries narrowly elliptic, 5–7 mm, sparingly pubescent and glandular, distinctly 3-veined, apex obtuse or slightly acute; corollas white, 3.5–5 mm, with slender tube and campanulate limb, sparsely puberulent. Achenes narrowly elliptic, ca. 3.5 mm, 4-ribbed, glandular; pappus off-white or reddish, 3.5–4 mm. Fl. and fr. Aug–Nov. 2n = 34, 36, 38.


微甘菊 *weig an ju*

Vines, slender, branched. Stems yellowish or brownish, usually terete, slightly striate, glabrate to sparsely puberulent. Leaves opposite; petiole 1–6 cm; blade ovate, 3–13 × ca. 10 cm, both surfaces glabrate with numerous glandular spots, base cordate to deeply so, margin entire to coarsely dentate, apex shortly acuminate. Synflorescence a corymbose panicle, capitula clustered on subcymose branches; phyllaries oblong, ca. 3.5 mm, glabrous to puberulent, apex shortly acuminate; corollas white, 2.5–3 mm, tube narrow, limb broadly campanulate, inside papillate. Achenes 1.5–2 mm, 4-ribbed, with many scattered glands; pappus setae dirty white, ca. 3 mm. Fl. and fr. year-round. 2n = 36, 72.

Naturalized in China [native to the Caribbean, Central and South America, and Mexico; widely introduced in Asia and the Pacific islands].


下田菊属 *xia tian ju shu*

*Lavenia* Swartz.

Herbs, perennial. Leaf blade narrowly elliptic to broadly ovate or hastate, crenate to strongly serrate, acute to slightly acuminate. Synflorescence very laxly cymose. Phyllaries 10–30, 2-seriate, ± overlapping, somewhat fused at base, equal to subequal; receptacle covered with discrete oval deeply concave scars. Florets 10–60; corollas usually white, narrowly funnelform or with narrow basal tube and broadly campanulate limb, usually with hairs or glands on outer surface, hairs often moniliform; lobes 5, ca. 1.5 × longer than wide, not papillose; antherodium usually strongly expanded below; anther appendages distinctly shorter than wide; style shaft with or without long hairs; style branches slightly to strongly clavate, often forming most showy part of head, fleshy, rounded apically, scarcely mammillate below. Achenes slightly curved, usually 3-angled without distinct ribs or 5-angled, often tuberculate; carpodium forming a prominent asymmetrical knob; pappus usually of 3 or 5 terete clavate knobs, knobs with tips and upper outside surface covered with an elongated mass of viscid glands. x = 10.

About 26 species: pantropical; one species in China.


下田菊*xia tian ju*

Herbs, annual, 30–100 cm tall. Stems erect, solitary, rigid, usually divaricately branched in upper part, white puberulent, glabrous in lower part. Leaves remote; basal leaves persistent or withered at anthesis; median leaves large; petiole narrowly winged, 0.5–4 cm; blade elliptic-lanceolate to elliptic or rhombic-elliptic, or broadly ovate to cordate, 4–12 × 2–5 cm, both surfaces sparingly puberulent or glabrescent, usually rather densely hairy on veins, base broadly or narrowly cuneate, margin crenate or incised, serrate, or doubly serrate, apex acute or obtuse; upper and lower leaves smaller, shortly petiolate. Capitula few, rarely many, small, in a lax or dense corymb or panicle; peduncle 0.8–3 cm, gray-white or ferruginous puberulent; involucre hemispheric, 4.5 × 6–8 mm, to 10 mm in diam. at fruiting; phyllaries 2-seriate, green, subequal, narrowly elliptic, thin, submembranous, outer phyllaries mostly connate, sparsely white villous, apex obtuse; corollas ca. 2.5 cm, viscid-glandular, pubescent. Achenes blackish brown when mature, oblong-elliptic, ca. 4 × 1 mm, glandular, sometimes densely tuberculate, contracted at base, apex obtuse; pappus elements clavate, ca. 4.1 mm, basally connate into a ring, fulvous viscid-glandular. Fl. and fr. Aug–Oct. 2n = 20.

Watersides, roadsides, forests and thickets on slopes, forest margins; 400–2300 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Nanhai Zhudao, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [India, Japan, Korea, Myanmar, Nepal, Philippines, Thailand; probably widespread throughout SE Asia, Australia].

This is an extremely variable and problematic taxon. *Adenostemma lavenia* is regarded by some authorities as distinct from *A. tinctorium* and *A. viscous*, and to be endemic to Sri Lanka (cf. King & Rob-

1a. Leaves broadly ovate or cordate, margin incised, serrate, or doubly serrate; achenes densely tuberculate ................... 1b. var. latifolium

1b. Leaves elliptic-lanceolate to elliptic or rhombic-elliptic, margin crenate.

2a. Leaves elliptic-lanceolate, margin crenate; achenes glandular ................. 1a. var. lavenia

2b. Leaves elliptic-lanceolate, rhombic-elliptic, or elliptic, thick; achenes densely tuberculate ..................... 1c. var. parviflorum

1a. Adenostemma lavenia var. lavenia

下田菊(原变种) xia tian ju (yuan bian zhong)


Leaves elliptic-lanceolate, margin crenate. Achenes glandular.

Watersides, roadsides, forests and thickets on slopes; 400–2000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Nanhai Zhudao, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [India, Japan, Korea].


宽叶下田菊 kuan ye xia tian ju


Leaves broadly ovate or cordate, margin incised, serrate, or doubly serrate. Achenes densely tuberculate.

Forest margins, shaded wet places by rivers, along coasts, thickets; 500–2300 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Nanhai Zhudao, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [India, Japan, Korea].

1c. Adenostemma lavenia var. parviflorum (Blume) Hochreutiner, Candollea 5: 298. 1934.

小花下田菊 xiao hua xia tian ju

Lavenia parviflora Blume, Bijdr. 905. 1826; Adenostemma parviflorum (Blume) Candolle; A. viscosum var. parviflorum (Blume) J. D. Hooker.


● Hainan, Hunan, Jiangxi, Taiwan.

239. GYMNOCORONIS Candolle, Prodr. 5: 106. 1836.

裸冠菊属 luo guan ju shu

Herbs, annual to perennial, erect. Leaf blade lanceolate to ovate or deltate. Synflorescence strongly cymose. Phyllaries 20–50, 2-seriate, equal to subequal; receptacle with discrete oval scars and with soft tissue in between. Florets 50–200; corollas white, narrowly funnelform, with shortly stipitate glands on outer surface; lobes as wide as long to wider than long; antheropodium slightly enlarged; anther appendages small, wider than long; style branches very broadly oar-shaped, mammillate abaxially, smooth adaxially. Achenes slightly curved, prismatic, (4 or)5-ribbed, glandular between ribs, ribs sometimes corky; carpodium broadly cylindrical; pappus absent.

Five species: Mexico and South America, one species recently naturalized in Japan and China; one species (introduced) in China.


裸冠菊 luo guan ju


Herbs, perennial, 1–1.5 m tall. Stems erect, few branched, glabrous, angled, fistulose. Leaves opposite, glabrous, broadly lanceolate to ovate; petiole ca. 2.5 cm; blade 8–12(–18) × 1–2.5(–9) cm, 3-veined or veins pinnate, base attenuate, rarely truncate, margin serrate, apex acute. Synflorescence terminal, cymose. Involucre hemispheric, ca. 4 × 8 mm; phyllaries 2-seriate, lanceolate, outside pubescent; receptacle convex; corollas white, ca. 4 mm, short-stipitate glandular throughout; style base lacking basal node, glabrous; style branches clavate to oar-shaped, white or pink. Achenes ca. 3 mm, 5-ribbed, body gland-dotted. Fl. and fr. Sep–Oct. 2n = 20.

Recently introduced, and now naturalized, in Guangxi, Taiwan, and Yunnan [native to South America; naturalized in Australia, Japan, and Pacific islands (New Zealand)].

Gymnocoronis spilanthoides is an emergent plant and prefers marshes or pond sides. It spreads by the stems, which easily produce roots.

藿香蓟属 huo xiang ji shu

Caelestina Cassini; Carelia Fabricius; Isocarpha Lessing (1830), not R. Brown (1817).

Subshrubs or annual to perennial herbs. Leaves opposite or sometimes alternate; blade elliptic or lanceolate to deltate or ovate, margin entire to dentate. Synflorescence cymose to subcymose, sometimes subumbellate. Phyllaries 30–40, distant, 2– or 3-seriate, equal or subequal, lanceolate, markedly hardened, often with scarious margin; receptacle conical, glabrous or paleaceous. Florets 20–125; corollas white, blue, or lavender, funnelform or with distinct basal tube; lobes 5, as long as wide, partially papillose and sometimes hispidulous on outer surface, papillose on inner surface; antheropodium cylindric; style base not enlarged, glabrous, style branches linear, usually strongly and densely papillose. Achenes prismatic, 4- or 5-ribbed, glabrous or ribs setuliferous; carpopodium distinct; pappus of 5 or 6 free, flattened, sometimes awnlike, scales or lacking or coroniform. x = 10, 20.

About 40 species: Central and South America, one species (Ageratum houstonianum) widely cultivated and another species (A. conyzoides), although sometimes cultivated, a widespread weed throughout the tropics in both the Old and New Worlds; two species (both introduced) in China.


1. Ageratum houstonianum Miller, Gard. Dict., ed. 8, Ageratum no. 2. 1768.

熊耳草 xiong er cao

_Ageratum houstonianum_ Sims.

Herbs, annual, 30–70(–100) cm tall. Stems erect, simple or branched from middle or lower part; stems and branches purple-red, green, or straw-colored, white tomentose or thinly lanate. Leaves broadly ovate or triangular-ovate; petiole 0.7–3 cm; median stem leaves 2–6 × 1.5–3.5 cm, or length equal to width; upper and axillary leaves smaller; all leaves basally 3- to inconspicuously 5-veined, both surfaces sparsely or densely white pubescent, base cordate or truncate, apex acuminate, margin dentate to crenate-serrate, apex rounded or acute; petioles of upper leaves and axillary branches usually spreading white long tomentose. Synflorescence corymbose, 2–4 cm in diam.; peduncle densely pubescent or powdery pubescent. Capitula 5–15 or more; involucre campanulate, 6–7 mm in diam.; phyllaries 2– or 3-seriate, narrowly lanceolate, 4–5 mm, abaxially glandular pubescent, margin entire, apex long acuminate; corollas tubular, 2.5–3.5 mm; limb purplish; lobes pubescent. Achenes black, 5-angled, 1.5–1.7 mm; pappus of 5 short free scales; scales oblong-lanceolate, 2–3 mm, apex aristate-acuminate, sometimes truncate and 0.1–1.5 mm. Fl. and fr. year-round. 2n = 20, 40.

Grasslands, roadsides, slopes in valleys; 100–1500 m. Cultivated and naturalized in Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Jiangxi, Nanhai Zhuadao, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [native to tropical America; cultivated and naturalized in India, Myanmar, Nepal, Thailand; Africa].

_Ageratum houstonianum_ is used medicinally. People in Central America (Ecuador) use the plant as an antiphlogistic, to relieve swelling and pain in the throat.


藿香蓟 huo xiang ji

Herbs, annual, 50–100 cm tall, sometimes less than 10 cm, with inconspicuous main root. Stems robust, ca. 4 cm in diam. at base, simple or branched from middle, stems and branches reddish or green toward apex, white powdery puberulent or densely spreading long tomentose. Leaves often with auxiliary abortive buds; petiole 1–3 cm, densely white spreading villous; median leaves ovate, elliptic, or oblong, 3–8 × 2–5 cm; upper leaves gradually smaller, oblong, sometimes all leaves small, ca. 1 × 0.6 cm, both surfaces sparsely white puberulent and yellow gland-dotted, basally 3- to obscurely 5-veined, base obtuse or broadly cuneate, margin crenate-serrate, apex acute. Capitula small, 4–14, in dense terminal corymbs; peduncle 0.5–1.5 cm, powder puberulent; involucre campanulate or hemispheric, ca. 5 mm in diam.; phyllaries 2-seriate, oblong or lanceolate-oblong, 3–4 mm, glabrous, margin lacerate; corollas 1.5–2.5 mm, glabrous or apically powdery puberulent; limb purplish, 5-lobed. Achenes black, 5-angled, 1.2–1.7 mm, sparsely white setuliferous; pappus scales 5 or awned, 1.5–3 mm. Fl. and fr. year-round. 2n = 20, 38, 40.

Valleys, forests, forest margins on slopes, riversides, grasslands, field margins. Cultivated and naturalized in Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Jiangxi, Nanhai Zhudao, Shaanxi, Sichuan, Taiwan, Yunnan; only cultivated in Hebei and Zhejiang [native to tropical America; widespread weed throughout Africa, India, Nepal, and SE Asia].

_Ageratum conyzoides_ is used medicinally in China to treat a variety of conditions, including common colds, headaches, boils, eczema, bleeding wounds, and burns.


泽兰属 ze lan shu

_Eupatoridpelphus_ R. M. King & H. Robinson.
Herbs, annual to perennial. Leaves opposite or verticillate, upper leaves subopposite to alternate; blade linear to ovate, deltate, or 3-lobed, serrate to subentire. Synflorescence a corymbose or pyramidal panicle. Phyllaries 10–22, weakly to strongly subimbricate, 2–5-seriate, sometimes inner phyllaries deciduous; receptacle flat or weakly convex. Florets 3–23; corollas white to purple, lavender, or pink, narrowly funnelform or with constricted basal tube and narrowly to broadly campanulate limb, outer surface with glands often concentrated at base of throat and on outer surfaces of lobes, rarely with a few hairs; lobes 5, usually slightly longer than wide; antheropodium cylindric; anther appendages large, ovate-triangular, ca. 1.5× as long as wide; style base puberulent or rarely glabrous, with or without node; style branches filiform to slightly broadened or flattened distally, papilllose. Achenes prismatic, 5-ribbed; carpodium not or slightly differentiated; pappus setae 25–40, barbellate, persistent, apical cells with rounded to shortly glabrous, with or without node; style branches filiform to slightly broadened or flattened distally, papilllose. 

Eupatoriadelphus is a group in Asteraceae with both sexual and agamospermous species. The results of the studies by G. J. Schmidt & E. E. Schilling (Amer. J. Bot. 87: 716–726. 2000) and those of M. Ito et al. (J. Plant Res. 113: 79–89. 2000) favor a distinct Eupatoriadelphus s.s. with both sexual and agamospermous species, the species here are simply arranged alphabetically. The presence of the hybrid E. ×tripartitum (Makino) Murata & H. Koyama (E. chinense × E. lindleyanum), a plant with tripartite leaves, has been recorded.


1a. Leaves glabrous and eglandular on both surfaces, or abaxially sparsely puberulent.

2a. Leaves undivided, ovate, triangular-ovate, or oblong-ovate, basally 3-veined; shrubs ................................. 14. E. tashiroi

2b. Leaves usually 3-lobed; lobes narrowly elliptic-lanceolate or oblanceolate, pinnately veined; perennial herbs; few branched .......................................................................................................................... 5. E. fortunei

1b. Leaves sparsely or densely puberulent or villous, or tomentose on both surfaces, glandular on both surfaces or at least abaxially; achenes setuliferous or glabrous but usually glandular.

3a. Leaves basally 3- or 5-veined.

4a. Phyllaries acute at apex.

5a. Leaves petiolate ................................................................................................................................................... 2. E. cannabinum

5b. Leaves sessile ....................................................................................................................................................... 9. E. lindleyanum

4b. Phyllaries obtuse or rounded at apex.

6a. Leaves usually tripartite, with large terminal lobe; achenes sparsely setuliferous above or at apex only .................................................................................................................................................. 11. E. nanchuanense

6b. Leaves simple; achenes sparsely long setuliferous.

7a. Capitula 9–15-flowered; shrubs ....................................................................................................................... 1. E. amabile

7b. Capitula 5-flowered; herbs.

8a. Leaves sessile, ovate or ovate-lanceolate, apex acute ................................................................................... 13. E. shimaedae

8b. Leaves shortly petiolate, ovate-oblong, apex long acuminate ........................................................................... 10. E. luchuense

3b. Leaves pinnately veined.

9a. Phyllaries acute at apex ........................................................................................................................................ 9. E. lindleyanum

9b. Phyllaries obtuse or rounded at apex.

10a. Leaves simple.

11a. Achenes glabrous and eglandular .................................................................................................................. 12. E. omeiense


12a. Leaf base cuneate, apex long acuminate, both surfaces sparsely crisped-pubescent, abaxial surface gland-dotted; synflorescence of lax corymbbs .................................................................................................................. 3. E. chinense

12b. Leaf base shallowly cordate or rounded, apex obtuse or shortly acuminate, both surfaces glabrous, abaxial surface gland-dotted; synflorescence of dense corymbbs .............................................................. 7. E. hualiense

10b. Leaves divided.

13a. Achenes glabrous and eglandular .................................................................................................................. 4. E. formosanum

13b. Achenes glandular.

14a. Leaves simple, ovate, broadly ovate, or narrowly ovate, base rounded, sessile or very shortly petiolate ........................................................................................................................................ 3. E. chinense

14b. Leaves divided; lobes narrowly elliptic or lanceolate, or leaves simple, base truncate, petiolate, petiole 1–2 cm.

15a. Leaves white tomentose on both surfaces, abaxially and on veins densely tomentose, margin serrate-incised .......................................................................................................................... 6. E. heterophyllum

15b. Leaves scabrid, sparsely puberulent, margin finely serrate .................................................................................. 8. E. japonicum

多花泽兰 duo hua ze lan

Shrubs. Stems ca. 1 m tall, not scandent; branches slender, divaricate, striate, densely glandular villous in upper part. Leaves abaxially pale green, adaxially green, ovate or ovate-oblong, 9–12 × 3.5–4 cm, abaxially sparsely villous and glandular, adaxially subglabrous, basally 3-veined, sparsely villous on veins, base rounded, margin mucronate-serrate, apex long acuminate. Synflorescence of divaricate terminal corymbs. Capitula 9–15-flowered; involucre campanulate, ca. 5 mm; phyllaries 12–15, unequal, linear, apically much obtuse, 2- or 3-seriate, outer phyllaries very short, sparsely glandular villous; corollas tubular, ca. 4.5 mm, glandular. Achenes black, striate, flat, 12–15, unequal, linear, apically much obtuse, 2- or 3-seriately veined, base rounded, margin regularly crenate-serrate, apex acuminata or obtuse; upper stem leaves homomorphic with median leaves, but smaller; radical leaves withered by anthesis, margin irregularly crenate.

Synflorescences terminal, of large laxly compound corymbs, 20–30 cm in diam. Capitula numerous, 5-flowered; involucre campanulate, ca. 5 mm; phyllaries 3-seriate, imbricate; outer phyllaries short, ovate or lanceolate-ovate, white, membranous, glabrous, with yellow glands; corollas purple, pink, red, or reddish purple, ca. 5 mm, with yellow glands. Achenes pale black-brown, elliptic, ca. 3 mm, 5-ribbed, yellow glandular; pappus setae white, ca. 5 mm. Fl. and fr. Jul–Mar. 2n = 20*.

- Grasslands, slopes, rocks. Taiwan.


大麻叶泽兰 da ma ye ze lan

*Eupatorium nodiflorum* Wallich ex Candolle.

Herbs, perennial, 50–150 cm tall. Stems erect, fascicled; branches obliquely ascending, divericate synflorescence branches coriaceous, slender; stems and branches green initially, densely ferrugineous puberulent, later glabrescent, gray-brown. Leaves opposite; median stem leaves 3-partite; central lobe lanceolate, large, 10–15 × 2.5–3 cm, base cuneate, apex acuminate; lateral lobes lanceolate, small; upper leaves gradually smaller, irregularly lobed or serrate; upper stem leaves more densely ferrugineous puberulent, glabrescent in lower part by anthesis. Leaves opposite, sessile or subsessile with petiole to 2–4 cm; median stem leaves simple or 3-lobed, ovate or broadly ovate, 4.5–10(–20) × (2–)3–5(–6.5) cm, both surfaces scabrid, white puberulent and glandular, more densely so abaxially and on veins, pinnately veined, veins 3–7-paired, base rounded, margin regularly crenate-serrate, apex acuminata or obtuse; upper stem leaves homomorphic with median leaves, but smaller; radical leaves withered by anthesis, margin irregularly crenate.

Synflorescences terminal, of large laxly compound corymbs, 20–30 cm in diam. Capitula numerous, 5-flowered; involucre campanulate, ca. 5 mm; phyllaries 3-seriate, imbricate; outer phyllaries short, ovate or lanceolate-ovate, white, membranous, glabrous, with yellow glands; corollas white, membranous, glabrous, but with yellow glands; corollas white, pink, red, or reddish purple, ca. 5 mm, with yellow glands. Achenes pale black-brown, elliptic, ca. 3 mm, 5-ribbed, yellow glandular; pappus setae white, ca. 5 mm. Fl. and fr. Jun–Nov. 2n = 20, 30, 31, 39, 40, 50.

Forest margins on slopes, forests, thickets or grasslands on slopes; 200–1900 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Japan, Korea, Nepal].

One of us (Chen) does not accept the broad view of *Eupatorium chinense* by King and Robinson (Monogr. Syst. Bot. 22: 1–581. 1987), who included *E. japonicum*, together with many other synonyms, but excluded *E. reevesii* Wallich ex Candolle, which was synonymized with *E. squamosum* D. Don.

T. Kawahara et al. (Pl. Sp. Biol. 4: 37–46. 1989) found sexual diploids with restricted distribution and agamospermous polyploids with broad distributions in this complex. They mentioned sexual populations belong to different varieties, which are morphologically distinct from each other and have allopatric distributions, but agamospermous populations may be of hybrid origin and have significant morphological variation.

*Eupatorium chinense* is poisonous, especially the leaves, but it is used medicinally to treat large carbuncles, scabies, snakebites, and to alleviate pain.


台湾泽兰 tai wan ze lan

*Eupatorium cannabinum* Linnaeus subsp. *asiaticum* Kitamura; *E. formosanum* var. *quasitripartitum* (Hayata) Kitamura; *E. quasitripartitum* Hayata.

Herbs, perennial, or small shrubs or subshrubs, (50–)70–100(–250) cm tall. Lower part woody, well branched, stems often purplish red; branches ascending, upper branches and corymbose sordid-white puberulent, synflorescence branches and peduncles more densely hairy, glabrescent in lower part by anthesis. Leaves opposite, sessile or subsessile with petiole to 2–4 cm; median stem leaves simple or 3-lobed, ovate or broadly ovate, 4.5–10(–20) × (2–)3–5(–6.5) cm, both surfaces scabrid, white puberulent and glandular, more densely so abaxially and on veins, pinnately veined, veins 3–7-paired, base rounded, margin regularly crenate-serrate, apex acuminata or obtuse; upper stem leaves homomorphic with median leaves, but smaller; radical leaves withered by anthesis, margin irregularly crenate.

Synflorescences terminal, of large laxly compound corymbs, 20–30 cm in diam. Capitula numerous, 5-flowered; involucre campanulate, ca. 5 mm; phyllaries 3-seriate, imbricate; outer phyllaries short, ovate or lanceolate-ovate, white, membranous, glabrous, with yellow glands; corollas white, membranous, glabrous, but with yellow glands; corollas white, pink, red, or reddish purple, ca. 5 mm, with yellow glands. Achenes pale black-brown, elliptic, ca. 3 mm, 5-ribbed, yellow glandular; pappus setae white, ca. 5 mm. Fl. and fr. Jun–Nov. 2n = 20, 30, 31, 39, 40, 50.

Forest margins on slopes, forests, thickets or grasslands on slopes; 200–1900 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Japan, Korea, Nepal].

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*Eupatorium chinense* is poisonous, especially the leaves, but it is used medicinally to treat large carbuncles, scabies, snakebites, and to alleviate pain.
ally smaller; lower leaves simple, ovate or broadly ovate; upper leaves abaxially pale green, adaxially green, narrowly ovate or ovate-lanceolate, abaxially with many yellow glands and densely adpressed puberulent, adaxially sparsely scabrid-hairy, pinnately veined, lateral veins 5–7-paired, adaxially slightly prominent. Synflorescence of lax corymbs 8–11 cm in diam. Capitula numerous, 5-flowered; involucre campanulate, ca. 5 mm; phyllaries 3-seriate, imbricate, outer phyllaries elliptic, 1–1.5 mm, median and inner phyllaries longer, narrowly elliptic, ca. 5 mm, all phyllaries obtuse, glabrous and eglandular; corollas white, ca. 3.5 mm. Achenes black-brown, ca. 2.5 mm, angled, without hairs and glands; pappus off-white, ca. 3 mm. Fl. and fr. Dec–Aug. 2n = 20*.

Forest margins, grasslands. Taiwan [Japan (Ryukyu Islands)].


佩兰 pei lan

Eupatorium caespitosum Migo; E. chinense Linnaeus var. tripartitum Miquel; E. fortunei var. angustilobum Y. Ling; E. stochoadsumm Hance.

Herbs, perennial, 40–100 cm tall. Rhizomes procumbent, reddish brown. Stems erect, green or reddish purple, few branched or apically synflorescence branched, sparsely puberulent, more densely on synflorescences and peduncles. Median stem leaves large, 3-sect or 3-partite; petiole 0.7–1 cm; terminal lobe large, narrowly elliptic, elliptic-lanceolate, or oblanceolate, 7–10 × 1.5–2.5 cm, base cuneate, apex acuminate; lateral lobes identical to lobe large, narrowly elliptic, elliptic-lanceolate, or oblanceolate, 5–10 × 1.5–2.5 cm, apex acuminate; lateral lobes identical to terminal lobe but smaller, pinnately veined; margin coarsely toothed or irregularly finely toothed; lower stem leaves gradually smaller; radical leaves withered by anthesis. Capitula numerous in apical compound corymbs; synflorescence to 25 cm in diam. Involucre campanulate, 7–9 cm; phyllaries 3-seriate, imbricate; outer phyllaries short, ovate or broadly ovate, ca. 2 mm, outside sparsely white puberulent; median and inner phyllaries elliptic, 8–9 mm; all phyllaries purple-red or purplish rose, apex obtuse. Florets white or reddish tinged; corolla ca. 5 mm, with sparse yellow glands. Achenes black-brown, elliptic, ca. 3.5 mm, 5-angled, with yellow glands, glabrous. Pappus white, ca. 5 mm. Fl. and fr. Apr–Oct.

Forests, forest margins, grasslands on slopes and in valleys; 1700–3000 m. Anhui, Gansu, Guizhou, Hubei, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan [Nepal].

One of us (Hind) follows King and Robinson (Monogr. Syst. Bot. 22: 1–581. 1987) in treating Eupatorium heterophyllum as a synonym of E. cannabinum. However, the others of us (Chen and Kawahara) prefer to treat E. heterophyllum as a distinct species. Whereas the leaves of E. cannabinum are irregularly lobed, with the margin serrate and undulate, those of E. heterophyllum are 3-sect, with the margin rather regularly and deeply incised-crenate and not undulate. Basal leaves withered by anthesis. Capitula numerous in terminal compound corymb; synflorescence to 25 cm in diam. Involucre campanulate, 6–7 cm; phyllaries 3-seriate, imbricate; outer phyllaries short, ovate-lanceolate; median and inner phyllaries elliptic, 8–9 mm; all phyllaries purple-red or purplish rose, apex obtuse. Florets white or reddish tinged; corolla ca. 5 mm, with sparse yellow glands. Achenes black-brown, elliptic, ca. 3.5 mm, 5-angled, with yellow glands, glabrous. Pappus white, ca. 5 mm. Fl. and fr. Jul–Nov. 2n = 40.

Rare as a wild plant, but commonly cultivated, usually in thickets or roadside ditches; ca. 2000 m. ?Anhui, ?Fujian, Guangdong, Guanxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Yunnan, Zhejiang [introduced in Japan, Korea, N Thailand, Vietnam].

The whole plant of Eupatorium fortunei is fragrant like Lavandula angustifolia Miller when crushed.

The plant is used medicinally The fragrant stems and leaves are used for making fragrant oils.


异叶泽兰 yi ye ze lan

Eupatorium cannabinum Linnaeus var. heterophyllum (Candolle) Kitamura; E. mairei H. Léveillé; E. wallichii Candolle var. heterophyllum (Candolle) Diels.

Herbs perennial, 1–2 m tall, or subshrublike, woody in median-lower part. Stems erect, brownish or purple-red, 1–2 cm in diam. at base, branched, and with corymbose synflorescence branches, white or sordid-white puberulent, more densely hairy on synflorescence branches and peduncles, glabrescent or sparsely hairy in middle-lower part by anthesis. Leaves opposite; median stem leaves large, 3-sect, -partite, or -lobeate; petiole 0.5–1 cm; central lobe large, elliptic or lanceolate, 7–10 × 2–3.5 cm, base cuneate, apex acuminate; lateral lobes homomorphic with central lobe, smaller, or all stem leaves simple, oblong, elliptic-lanceolate, or ovate, abaxially densely gray-white tomentose, adaxially scabrid, white puberulent, both surfaces with dense yellow glands, pinnately veined, lateral veins 3–7-paired, abaxially prominent, margin rather regularly and deeply incised-crenate, not undulate; basal leaves withered by anthesis. Capitula numerous in terminal compound corymb; synflorescence to 25 cm in diam. Involucre campanulate, 7–9 cm; phyllaries 3-seriate, imbricate; outer phyllaries short, ovate or broadly ovate, ca. 2 mm, outside sparsely white puberulent; median and inner phyllaries elliptic, 8–9 mm; all phyllaries purple-red or purplish rose, apex obtuse. Florets white or reddish tinged; corolla ca. 5 mm, with sparse yellow glands. Achenes black-brown, elliptic, ca. 3.5 mm, 5-angled, with yellow glands, glabrous. Pappus white, ca. 5 mm. Fl. and fr. Apr–Oct.

Forests, forest margins, grasslands on slopes and in valleys; 1700–3000 m. Anhui, Gansu, Guizhou, Hubei, Shaanxi, Sichuan, ?Taiwan, Xizang, Yunnan [Nepal].

The stems or whole plant of Eupatorium heterophyllum are used medicinally for treating injuries and trauma.


花莲泽兰 hua lian ze lan

Herbs, perennial. Stems erect, 50–150 cm, simple or branching apically, branches divaricate and ascending. Leaves: petiole short, 2–10 mm; median leaves broadly ovate, thick, 6.5–9 × 4.5–6.5 cm, lateral veins 5–7 pairs, both surfaces glabrous, abaxially gland-dotted, base shallowly cordate or rounded, margin serrate with obtuse teeth, apex obtuse or shortly acuminate. Synflorescence of compact corymbs. Capitula numerous, 5–8-flowered; involucre cylindric; phyllaries 3-seriate, sparsely gland-dotted, apices obtuse or rounded. Corolla tubular, ca. 3.5 mm, glandular. Achenes 5-ribbed, black, 3–4 mm, gland-dotted, sparsely setuliferous; pappus whitish, 3–4 mm, barbellate.

● Cliffs. Taiwan.


白头婆 bai tou po
Eupatorium chinense Linnaeus var. simplicifolium (Makino) Kitamura; E. chinense var. tozanense (Hayata) Kitamura; E. fortunei Turczaninow f. aureorecutilatum (Makino) Nakai; E. fortunei var. simplicifolium (Makino) Nakai; E. fortunei var. tripartitum (Makino) Nakai; E. japonicum f. aureorecutilatum Makino; E. japonicum var. dissectum Makino; E. japonicum var. simplicifolium Makino; E. japonicum var. tozanense (Hayata) Kitamura; E. japonicum var. tripartitum Makino; E. japonicum var. wallichii (Candolle) Yamamoto; E. tozanense Hayata; E. wallichii Candolle.

Herbs perennial, 50–200 cm tall. Rhizomes short, with numerous fibrous roots. Stems erect, purplish red, usually simple or corymbose synflorescence branched in upper part, while crisped-puberulent, more dense on synflorescence branches, glabrescent or sparsely hairy in lower part. Leaves opposite; petiole 0.5–2 cm, rather thick; median stem leaves elliptic, narrowly elliptic, ovate-elliptic, or lanceolate, 6–20 × 2–6.5 cm, pinnately veined, lateral veins 7-paired, abaxially prominent, base broadly or narrowly cuneate, margin sometimes 3-partite, apex acuminate; basal stem leaves withered by anthesis; upper leaves smaller, homomorphic with median leaves; both surfaces scabrid, crisped-villosus or puberulent and yellow glandular, more densely hairy abaxially on veins and on petiole; margin coarsely or doubly serrate. Capitula apically densely corymbose, synflorescence usually 3–6 cm in diam., rarely forming a large compound corymbose synflorescence to 20 cm in diam. involucre campanulate, 5–6 mm, 5-flowered; phyllaries 3-seriate, imbricate; outer phyllaries short, lanceolate or broadly lanceolate, 1–2 mm, median and inner phyllaries longer, elliptic or elliptic-lanceolate, 5–6 mm; all phyllaries green or purple-reddish, acute; corollas white, pink, or purplish red, ca. 4.5 mm, with sparse yellow glands. Achenes black-brown, elliptic, ca. 3 mm, 5-ribbed; pappus white, equal to or rather longer than corollas. Fl. and fr. May–Dec. 2n = 20, 30, 40.

Shaded wet places in valleys, wet places in forests or grasslands; 200–2600 m. Throughout China except Xinjiang [Japan, Korea, Myanmar, Philippines, Russia (Siberia)].

1a. Leaves with yellow glands abaxially .......................... 9a. var. lindleyanum
1b. Leaves eglandular abaxially ........................ 9b. var. eglandulosum

9a. Eupatorium lindleyanum var. lindleyanum

Lin泽兰(原变种) lin ze lan (yuan bian zhong)

Eupatorium lindleyanum f. aureorecutilatum; E. lindleyanum f. trifoliolatum Makino; E. subtetragonum Miquel.

Leaves with yellow glands abaxially.

Shaded wet places in valleys, forests, or grasslands; 200–2600 m. Throughout China except Xinjiang [Japan, Korea, Russia (Siberia)].

The stems and leaves of Eupatorium lindleyanum var. lindleyanum are used medicinally as a carminative and vasopressin (i.e., to promote water retention).

9b. Eupatorium lindleyanum var. eglandulosum


无腺林泽兰 wu xian lin ze lan

Eupatorium lindleyanum f. eglandulosum (Kitamura) Murata & H. Koyama.

Leaves eglandular abaxially.

● Jiangsu, Zhejiang.


基隆泽兰 ji long ze lan

Eupatorium kiirunense (Kitamura) C. H. Ou & S. W. Chung; E. luchuense var. kiirunense Kitamura.

Herbs, perennial. Rhizome short. Stems 50–120 cm tall, often woody at lower part, decumbent, sometimes forming tussocks, glabrescent. Leaves opposite, shortly petiolate; petiole 3–8 cm; blade adaxially shiny, obvate to elliptic-lanceolate, 8–10 × 5–7 cm, subglabrous, abaxially glandular, 3-veined, base truncate or cordate, margin simple, serrate with obtuse teeth, apex long acuminate. Capitula numerous in terminal corymbs; synflorescence 10–17 cm in diam., ± loose; phyllaries 4–5 mm; corollas white to pale pink, 3–4 mm. Achenes 2.5–3 mm; pappus white, ca. 5 mm. Fl. and fr. Jan–Aug. 2n = 20.

Eupatorium kiirunense (Kitamura) C. H. Ou & S. W. Chung; E. luchuense var. kiirunense Kitamura.
Open places, often on rock walls and coral-based islands. Taiwan [Japan (Ryukyu Islands)].


南川泽兰 nан chuan ze lan

Herbs, perennial, 30–120 cm tall. Rhizomes procumbent; stems erect, brownish, purple-red, or dark purple-red; branches ascending; upper synflorescence branches corymbose; stems and branches white crimpled-puberulent, more densely hairy on peduncles, sparsely hairy, or glabrescent in lower part. Leaves irregularly opposite, often with axillary leaf buds, abaxially pale green, adaxially dark green; median stem leaves 3- to 5-lobed, incised-dentate; upper leaves 3- to 5-mm, elliptic or lanceolate-elliptic, 6–8 cm, base cuneate, pinnately lobed, partite, apex caudate-acuminate; basal segment large; lateral lobes smaller, yellow white or reddish, ca. 5 mm, with few yellow glands. Achenes black-brown, elliptic, ca. 3 mm, 6-angled, sparsely white adpressed puberulent and yellow glan
dular; basal leaves withered by anthesis; all leaves with both surfaces sparsely white adpressed puberulent in middle-lower glandular. Synflorescence terminal or compound corymbs, 8–12 cm in diam. Capitula numerous; involucre campanulate; phyllaries 3-seriate, imbricate, outer phyllaries short, elliptic, ca. 2.5 mm, median and inner phyllaries elliptic or lanceolate-elliptic, ca. 5 mm, all phyllaries purple tinged, apically rounded; corollas reddish or yellow, ca. 5 mm, with sparse yellow glands. Achenes black-brown, elliptic, ca. 3 mm, 6-angled, sparsely white setuliferous apically. Fl. and fr. Jun–Jul.

- Hill slopes; 1200–1700 m. Chongqing (Nanchuan), Yunnan (Daguan).


峨眉泽兰 e mei ze lan

Herbs, perennial. Rhizomes robust, with numerous adventive roots. Stems erect, 1–2 m tall, multibranched; branches ascending, slender; synflorescence branched, corymbose in upper part. Stems and branches purplish dirty-white puberulent; synflorescence branches and peduncles rather densely hairy, sparsely hairy or glabrous in lower part by anthesis. Leaves opposite, thickly papery, median stem leaves abaxially pale green, adaxially dark green, elliptic or ovate-oblong, 6–9 × 2–3.5 cm, both surfaces sparsely white puberulent and with yellow glands, pinnately veined, lateral veins 4- or 5-paired, base cuneate, margin subentire or repand-crenate, apex acuminate; upper leaves homomorphous with middle leaves, but smaller, basal leaves withered by anthesis. Synflorescence of terminal compound corymbs. Capitula numerous, 5-flowered; involucre campanulate, ca. 4 mm; phyllaries 2- or 3-seriate, imbricate; outer phyllaries short, elliptic, ca. 1 mm; median and inner phyllaries gradually longer, elliptic, ca. 4 mm, puberulent, without glands, apex rounded; corollas white, ca. 4 mm, sparsely yellow glandular. Achenes blackish brown, subelliptic, 5-ribbed, glabrous and eglandular; pappus white, ca. 4 mm. Fl. and fr. Sep–Nov.

- Roadsides on hill slopes; 700–900 m. Sichuan (Emei Shan, Tianquan).


毛果泽兰 mao guo ze lan

Herbs, perennial, 40–80 cm tall. Rhizomes short, procumbent. Stems erect, fulvous or purple-tinged, ca. 4 mm in diam. at base, usually simple, or with terminal corymbose synflorescence branches, rarely few branched, white puberulent in upper part, densely hairy on synflorescences and peduncles, glabrescent in lower part. Leaves opposite, thick, simple, abaxially pale green, adaxially green, sessile or nearly so; median leaves large, ovate-lanceolate, ovate-oblong, or ovate, 8–10 × 5–7 cm, base rounded or truncate, apex caudate-acuminate; from middle part upward or downward gradually smaller, but homomorphic with median stem leaves; all leaves abaxially with yellow glands, both surfaces white puberulent, densely hairy on veins, basally 3-veined, margin coarsely or shallowly serrate. Synflorescences terminal, of compound corymbs, 8–18 cm in diam. Capitula numerous, 5-flowered; involucre campanulate, ca. 6 mm; phyllaries 2- or 3-seriate, imbricate, outer phyllaries short, oblong or lanceolate-oblong, 2–2.5 mm, median and inner phyllaries oblong, ca. 6 mm, all phyllaries sparsely shortly pubescent, without glands, apex obtuse or rounded; corollas white or purplish, ca. 4 mm, with few yellow glands. Achenes black-brown, elliptic, 3–3.5 mm, 5-ribbed, sparsely villous, eglandular; pappus off-white, ca. 4 mm. Fl. and fr. May–Jun. 2r = 20*.

- Grasslands on slopes, rocky places. Fujian, Taiwan.


本泽兰 mu ze lan

*Eupatorium clematideum* (Wallich ex Candolle) Schultz Bipontinus var. gracilimum (Hayata) C. I. Peng & S. W. Chung; *E. gracilimum* Hayata; *E. tashiroi* f. gracilimum (Hayata) Sasaki; *E. tashiroi* var. gracilimum (Hayata) Yamamoto.

Shrubs, subshrubs, or herbs, scandent. Stems terete, slender, glabrous; branches divaricate, flexuous. Leaves opposite; petiole 4–6 mm; blade 4–8 × 2–3 cm, thin, 3-veined, base obtuse or rounded, margin dentate, apex acuminate. Synflorescence a lax corymb. Capitula 5-flowered, ca. 1 cm; peduncle 1–1.5 cm, pubescent; involucre narrowly campanulate; phyllaries narrowly lanceolate, 1- or 2-seriate, outer phyllaries ca. 1.5 mm, inner phyllaries ca. 5 mm, margin scarious; corollas white, ca. 4 mm. Achenes black, cylindric, ca. 2.5 mm, 5-ribbed, glabrous; pappus 1-seriate, 3–4 mm, barbellate. 2r = 20*.

- Mountains. C and S Taiwan.

*Eupatorium clematideum* (Wallich ex Candolle) Schultz Bipontinus (= *E. squamosum* D. Don) was recognized in Fl. Taiwan, ed. 2 (4: 953. 1998); however, *E. clematideum* is a native of Nepal, and the plants in Taiwan are actually *E. tashiroi*. 

南泽兰属 *nan ze lan shu*

Subshrubs or herbs, erect. Leaves opposite below, often subopposite or alternate above; blade ovate to narrowly oblong, usually crenulate to serrulate. Synflorescences of terminal flattened corymbose panicles. Involucre campanulate, 5–6 × 4–5 mm; phyllaries 12–18, 2- or 3-seriate, mostly unequal; receptacle flat or slightly convex. Florets 9–23, fragrant; corolla white, rarely lilac, narrowly funnelform with rather narrow tube, glands on outer surface; lobes ca. 1.5 × as long as wide, without stomata; lower part of filaments slender and flexuous; antheropodium narrowly cylindrical; anther appendages ovate-oblong, longer than wide, style base not enlarged, densely puberulent; style filiform. Achenes prismatic, 5-ribbed; carpopedium distinct; pappus setae 30–40, slender, barbellate, persistent, apical cells often enlarged, with rounded tips. *x* = 10.

Thirteen species: S South America, one species adventive in the palaeotropics; one species (introduced) in China.


南泽兰 *nan ze lan*


Subshrubs or perennial herbs, to 3 m tall. Stems erect, few branched, brownish, terete, densely puberulent. Leaves mostly opposite; petiole ca. 15 mm, winged toward blade; blade narrowly ovate to lanceolate, ca. 15 × 6 cm, abaxially densely puberulent and gland-dotted, adaxially sparsely to densely puberulent, gland-dotted, 3-veined, base rounded to cuneate, abruptly narrowed, margin serrulate to crenate-serrate, apex narrowly acuminate. Synflorescence a broad dense corymb; peduncles 2–5 mm, densely puberulent. Capitula 6–7 mm, 8–15 florets; phyllaries 3-seriate, subimbricate, broadly oblong, 1.5–6 mm, margin and tip scarious, weakly 2–4-ribbed, puberulent outside, apex slightly acute to rounded; corollas white, 4–4.5 mm, tube and lobes sparsely gland-dotted, lobes with few hairs. Achenes 1.8–2 mm, glabrous or very sparsely gland-dotted; carpopedium short; pappus 1-seriate, persistent, 3.5–5 mm, barbellate, off-white. [Fl. and fr. Oct–May in South America.]

Introduced and naturalized in Taiwan [widespread in Central and South America; naturalized in Indonesia and Sri Lanka].

T. W. Hsu et al. (Taiwania 51: 41–45. 2006) reported *Austroeupatorium inulifolium* as a newly naturalized plant in Taiwan.


假臭草属 *jia chou cao shu*

Subshrubs or annual or perennial herbs, erect to decumbent. Leaves opposite below, often subopposite or alternate above; blade ovate to narrowly oblong, usually coarsely serrate, apex narrowly acuminate. Synflorescence of terminal corymb; peduncles 2–5 mm, densely puberulent. Capitula 4–5 mm, 8–15 florets; phyllaries 2- or 3-seriate, unequal, gradate, outer phyllaries falling first; receptacle conical, glabrous. Florets 25–30; corollas white, blue, or lavender, narrowly funnelform or with cylindric throat and slightly longer than wide, often toothed at tip; style base not enlarged; style branches long, narrowly linear, more broadened in distal half, densely long papillose. Achenes slightly to strongly obcompressed, 3- or 4-ribbed, sparsely setuliferous; carpopedium distinct, broad, highly asymmetrical; pappus setae ca. 40, persistent, not or scarcely broadened distally. *x* = 10.

Sixteen species: South America, one species adventive in E Asia and Australia; one species (introduced) in China.


假臭草 *jia chou cao*


Subshrubs or annual herbs, to 0.6 m tall. Stems erect or ascending, bright green, simple or poorly branched at base, leafy throughout except at base, pubescent throughout, hairs simple, eglandular. Leaves opposite, rank-smelling; petiole 3–7 mm; blade ovate, 20–35 × 12–25 mm, pubescent below, hairs long, simple, eglandular along venation, stipitate glandular and gland-dotted between veins, base attenuate, margin coarsely serrate, apex acute. Synflorescence terminal, corymbose, capitula pedunculate; peduncles 4–7 mm, pubescent; involucre narrowly campanulate, 4–5 mm in diam.; phyllaries 2- or 3-seriate, with scattered short simple eglandular hairs at base, glabrous apically, margin ciliate, apex long attenuate; receptacle conical, epealeate. Florets 35–40; corollas bright lilac-blue, ca. 4.5 mm; corolla lobes long papillose on inner surface, usually glabrous outside or with few simple eglandular hairs; anther appendages longer than wide, apex acute; style base not swollen, glabrous, bright lilac-blue; style branches coarsely papillose. Achenes 2–2.5 mm, 3–5-ribbed, ribs pale, setuliferous or glabrous, body black, with scattered setulae; pappus setae 3.5–4.5 mm, coarsely barbellate, off-white. Fl. and fr. often year-round.

Introduced and becoming naturalized in Guangdong and Taiwan [widespread in South America, becoming weedy in many cultivated areas; introduced and becoming naturalized in E Asia and N Australia].
244. CHROMOLAENA Candolle, Prodr. 5: 133. 1836.

飞机草属 fei ji cao shu

Osmia Schultz Bipontinus.

Subshrubs, shrubs, or perennial herbs, erect to somewhat scandent. Leaves usually opposite; blade mostly ovate or triangular to elliptic, sometimes linear, subtire to lobed. Synflorescences usually thyrsoid to candelabroform or with lax to densely corymbose branches, rarely of solitary capitula on long erect peduncles. Phyllaries 18–65, 4–6-seriate, markedly unequal, gradate, often with expanded herbaceous or colored tips; receptacle flat to slightly convex, glabrous, sometimes paleaceous. Florets 6–75; corollas white, blue, lavender, or purple, rather cylindric with scarcely narrower base, outer surface smooth below lobes, with few to many shortly stalked glands, often with rather stiff hairs; lobes slightly to distinctly longer than wide; usually densely papillose on inner surface, or smooth (Chromolaena subg. Osmiella R. M. King & H. Robinson); antheropodia usually broader below, narrowed apically, or not broadened below (C. subg. Osmiella); anther appendages large, oblong, ca. 1.5 × as long as wide, entire or crenulate at tip; style base not enlarged; style branches narrowly linear to slightly broadened distally, slightly mammillate to densely long papillose. Achenes prismatic, (3–)5-ribbed, with setulose mostly on ribs; carpopodium distinct, broadly cylindric or narrowed below; pappus setae ca. 40, slender, persistent, not or scarcely broadened distally. x = 10, 16.

About 165 species: New World tropics and subtropics, one species a pantropical weed; one species (introduced) in China.

King and Robinson (Monogr. Syst. Bot. 22: 1–581. 1987) noted two subgenera and provided characters in their generic description to separate species of Chromolaena subg. Osmiella. Concern is growing in many tropical countries over the alarming spread of the weed Chromolaena odorata (e.g., C. Zachariades et al., Proc. 5th Int. Workshop Biol. Control Managem. Chromolaena odorata. 2002). The taxonomy and distribution of this species has been well documented by L. Gautier (Candollea 47: 645–662. 1992).


飞机草 fei ji cao


Herbs, perennial. Rhizomes robust, procumbent. Stems erect, 1–3 m tall, striate; branches robust, often opposite, spreading and horizontal, rarely alternate forming an acute angle with stem; stems and branches densely fulvous tomentose or shortly pubescent. Leaves opposite; petiole 1–2 cm; blade abaxially pale, adaxially green, ovate, triangular, or ovate-triangular, 4–10 × 1.5–5 cm, rather thick, both surfaces scabrid, villos with red-brown glands, abaxially and on veins more densely so, basally 3-veined, lateral veins fine, abaxially slightly raised, base truncate or shallowly cordate, margin sparsely coarsely and irregularly crenate or entire, or serrate on one side, or with one coarse tooth or 3-fid on each side, apex acute; leaves below synflorescence small, often entire. Synflorescence of numerous or few capitula in coryms or compound coryms; pedunule thick, densely shortly pubescent. Capitula ca. 20-flowered; involucre cylindric, ca. 10 × 4–5 mm; phyllaries 3- or 4-seriate, imbricate, outer phyllaries ovate, ca. 2 mm, puberulent, apex obtuse, median and inner phyllaries straw-colored, oblong, 7–8 mm, broadly 3-veined, eglandular, apex acuminatae; corollas white or pink, ca. 5 mm. Achenes black-brown, ca. 4 mm, 5-ribbed, eglandular, sparsely white adpressed setuliferous along ribs. Fl. and fr. Apr–Dec. 2n = 58, 60.

Forest margins, roadsides, open disturbed land. Introduced in Hainan during World War II; naturalized in Fujian, Hainan, and Yunnan [native to Mexico; widely naturalized in tropical Asia].

Chromolaena odorata is a competitive and pernicious weed.

245. CONOCLINIUM Candolle, Prodr. 5: 135. 1836.

锥托泽兰属 zhui tuo ze lan shu

Herbs, perennial, erect, rhizomatous. Leaves opposite; blade ovate to deltate-ovate, crenate to bipinnatifid. Synflorescence laxly cymose below, with densely cymose branches. Phyllaries 2- or 3-seriate, ca. 25, distant, mostly subequal, lanceolate; receptacle highly conical, glabrous or rarely pubescent. Florets 50–70; corollas blue or white, narrowly funnelform, with glands on outer surface; basal tube not constricted above nectary; lobes slightly longer than wide, outer surface papillose in distal half, inner surface with short bulging cells, mammillate to shortly papillose; antheropodia cylindric, often narrow; anther appendages ovate to ± quadrate, as long as wide; style base not enlarged, glabrous; style branches narrowly linear to filiform, slightly broadened distally, densely papillose. Achenes prismatic, 5-ribbed, glabrous or with a few scattered glands, rarely setuliferous above; carpopodium usually oblate, rarely distinct and asymmetrical; pappus setae uniseriate, ca. 30, barbellate, persistent, often with slightly to distinctly enlarged tips, apical cells obtuse to rounded. x = 10.

Four species: United States and Mexico, one species often cultivated and sometimes escaped; one species (introduced) in China.


锥托泽兰 zhui tuo ze lan

Herbs, perennial, 0.3–2 m. Stems usually erect, sometimes decumbent or procumbent and rooting at nodes. Leaves oppo-
site, petiolate; leaf blade triangular to deltate or ovate, 2–7(–13) \times 1.5–3 cm, base usually cuneate to truncate, rarely subcordate, margin serrate to serrate-dentate or crenate, apex acute. Phyllaries 3.5–4 mm; corollas blue to blue-violet or rosy violet, (1.6–)2–2.5 mm. Achenes 1–1.5 mm, glabrous; pappus setae not dilated at apices. Fl. and fr. Aug–Oct.

Cultivated and escaped, now growing in wet areas on slopes and roadsides. Guizhou, Yunnan [native to United States].
10. Tribe GNAPHALIEAE

鼠麴草族 shu qu cao zu

Chen Yousheng (陈又生), Zhu Shixin (朱世新); Randall J. Bayer

Herbs, subshrubs, or shrubs. Stems generally with fibers in phloem, without resin canals. Leaves alternate, rarely opposite, usually entire and tomentose at least abaxially. Capitula heterogamous disciform or homogamous discoid, rarely heterogamous radiate, solitary or variously grouped. Phyllaries generally papery, generally brightly colored or hyaline and with a thickened, cartilaginous basal portion (stereome) composed of compact sclerenchyma. Receptacles generally epaleate or paleate. Female outer florets generally filiform or often absent. Central florets generally bisexual, sometimes functionally male. Anthers ecalcarate, with tails; endothecial tissue almost always polarized. Pollen with 2-layered ektexine comprising an outer columnellate layer and an irregularly interlaced basal layer. Style branches with hairs apically, rarely dorsally; stigmatic rows generally separated. Achenes small, oblong to obovoid, usually hairy; pericarp generally with 2, 3, or 5 vascular bundles. Pappus generally of plumose or barbellate to scabrid capillary bristles, occasionally of bristles and scales, only scales, or absent.

About 185 genera and 1,240 species: nearly worldwide, with centers of concentration in S Africa and Australia; 12 genera (one endemic, one introduced) and 121 species (63 endemic, four introduced) in China.

1a. Receptacle with paleae; outer florets invaginated by paleae ................................................................. 174. Filago
1b. Receptacle without paleae.

2a. Pappus bristles connate into a ring.
3a. Pappus monomorphic.
4a. Leaf margins revolute ............................................................... 175. Phagnalon
4b. Leaf margins flat ........................................................................ 176. Gamochaeta
3b. Pappus dimorphic.
5a. Capitula subtended by bracteal leaves .................................................... 177. Leontopodium
5b. Capitula not subtended by bracteal leaves.
6a. Plants pulvinate; stolons absent; leaves small, ericoid .......................................................... 178. Sinoleontopodium
6b. Plants caespitose; stolons present; leaves larger, non-ericoid ...................................................... 179. Antennaria

2b. Pappus bristles free or coherent by patent cilia.
7a. Phyllaries brown or hyaline, inconspicuous.
8a. Stereome divided ........................................................................ 180. Gnomophalium
8b. Stereome undivided ...................................................................... 181. Gnaphalium
7b. Phyllaries white, yellow, pink, or reddish, conspicuous.
9a. Pappus dimorphic ........................................................................ 182. Anaphalis
9b. Pappus monomorphic.
10a. Outer female florets greater in number than central disk florets ..................................................... 183. Pseudognaphalium
10b. Outer female florets fewer in number than central disk florets.
11a. Capitula 2–5 cm in diam., solitary; phyllaries broader, inner ones broadly lanceolate, acuminate at apex, nitid, yellow, white, red, or purple ........................................... 184. Xerocrysum
11b. Capitula 4–6 mm in diam., in corymbos or compound corymbos; phyllaries narrower, acute or rounded at apex, yellow or white .................................................. 185. Helichrysum


絮菊属 xu ju shu

Chen Yousheng (陈又生); Randall J. Bayer

Herbs, annual. Stems with fibers in phloem, without resin canals, without pericyclic cambium. Leaves alternate, sessile, tomentose, eglandular. Capitula heterogamous, disciform, few together, surrounded by a ray of leaves. Phyllaries few seriate, cartilaginous or apically minutely papery, monomorphic, monochromous, brownish, transparent, not enclosing florets; stereome entire. Receptacles filiform, fragile; paleae subtending outer female florets, 3–5-seriate, imbricate, scarious. Female florets purple, filiform, outnumbering disk florets. Disk florets bisexual, or functionally male; corolla purple; corolla lobes 4, erect; veins ending below lobes. Anthers ecalcarate, with short tails; endothecial tissue polarized; apical appendage flat, as wide as thecae. Achenes brown, monomorphic, terete to compressed, cylindric to obovoid, with 2 vascular bundles, sparsely hairy with short, clavate, myxogenic twin hairs; epidermis smooth. Pappus monomorphic, of free scabrid capillary bristles in 1 row, basally with patent cilia; apical cells acute. x = 9, 13, 14.

About 46 species: N Africa, SW Asia, Atlantic islands, Europe; two species in China.
1a. Capitula 2–3 mm, few in dense corymbs; phyllaries 2- or 3-seriate; bracteal leaves slightly longer than synflorescence ................................................................. 1. F. arvensis

1b. Capitula ca. 5 mm, numerous in globose corymbs; phyllaries 3–5-seriate; bracteal leaves shorter than synflorescence ........................................................................................................................................ 2. F. spathulata


絮菊 xu ju

Gnaphalium arvense (Linnaeus) Willdenow; Logfia arvensis (Linnaeus) Holub.

Herbs, annual. Stems 5–35 cm tall, erect, panicularly branching, more rarely simple, sometimes forkedly branching in upper portion, with dense whitish or grayish lanate pubesence. Leaves lanceolate or linear-lanceolate, 5–15 × ca. 1.3 mm, with soft lanate pubescence, apex acute. Capitula 2–3 mm, ovate or pyramidal, gathered in 2s–10s into numerous corymbs, arranged at apices of stems and ramuscules and forming paniculate, racemose, more rarely spiciform synflorescences; floral leaves as long as or shorter than capitula. Involucre 2- or 3-seriate; phyllaries stellate-patent after ripening of achenes; outer phyllaries 5–10, closely surrounding female florets, green, in ate; phyllaries stellate-patent after ripening of achenes; outer phyllaries lanceolate, cymiform, 2–3 mm, ecarinate, abaxially with thick continuous gray lanate pubescence, glabrous at apex, slightly acuminate; inner phyllaries 5, becoming green in middle, broadly lanceolate, slightly concave, indistinctly pubescent or glabrous at margin abaxially, acuminate or obtuse. Achenes light brown, oblong-ovate, slightly flattened, 0.8–1 × ca. 0.3 mm, with sparse papilllose hairs, larger than in other species of genus. Pappus of female and bisexual florets with 12–15 finely crenate bristles. 2n = 28.

Dry slopes, dunes; ca. 1000 m. Xinjiang, Xizang [Kazakhstan, Mongolia, Russia; Europe].


匙叶絮菊 shi ye xu ju

Herbs, annual. Stems 5–80 cm tall, generally branching from base, with erect or ascending branches, often slightly sinuate, forkedly branching at apex, gray appressed pubescent. Leaves thin, oblong-ovate, 1.5–2 cm × 4–6 mm, pubescent with long appressed gray tomentum sparsely on both sides, narrowed to base, apex obtuse or shortly acuminate. Capitula ovate, ca. 5 mm, gathered in 10s–15s into dense ± globose corymbs, 6–12 mm in diam., arranged in bifurcations of stems and at apices of branches; floral leaves slightly exceeding capitula in length. Involucre 3–5-seriate; outer phyllaries lanceolate, cymiform, 5–5.5 × ca. 1 mm, abaxially with distinct light gray long lanate pubescence, apex straight or slightly un­bent, thin, with subulate acumen; inner phyllaries broadly lanceolate, flat, 4–4.5 mm, scarious, becoming green in middle, transparent white at margin, long acuminate at apex; innermost phyllaries lanceolate, shortly acuminate, or oblong-ovate, obtuse, flat, transparent white, glabrous. Bisexual florets 5–7. Achenes oblong-ovate, 0.5–0.8 × 0.2–0.4 mm, finely papillate, outer achenes epappose, inner ones bearing a few bristles. Pappus of bisexual florets with 12–14 bristles.

Dry slopes, dunes. Xinjiang, Xizang [Kazakhstan, Russia; SW Asia (Iran), Europe].


绵毛菊属 mian mao ju shu

Chen Yousheng (陈又生); Randall J. Bayer

Herbs or sometimes subshrubs, perennial. Stem with fibers in phloem, without pericyclic cambium and resin canals. Leaves generally sessile, sparsely hairy, margin often dentate, revolute. Capitula solitary or few together, heterogamous, disciform. Phyllaries generally cartilaginous but often with a papery apical portion, in several rows, outnumbering disk florets. Disk florets bisexual; corolla yellow; corolla lobes erect; veins reaching apex of lobes. Anthers ecalcarate, without tails; endothecial tissue polarized; apical appendages flat, as wide as thecae. Style branches obtuse, dorsally with obtuse sweeping hairs not reaching furcation; stigmatic surface basally separated but apically confluent. Achenes with 2 or 3 vascular bundles, sparsely hairy with elongated, not myxogenic twin hairs; epidermis smooth. Pappus of basally connate, barbellate, capillary bristles in 1 row; apical cells acute.

About 43 species: N Africa, C and SW Asia, Europe, Macaronesia; one species in China.


绵毛菊 mian mao ju

Phagnalon denticulatum Decaisne ex C. B. Clarke.

Subshrubs, with erect or decumbent stem, (5–)10–30(–40) cm tall, few to profusely branched, branches and stem densely covered with snow-white cottony wool. Branches densely foliate. Leaves variable in shape and size, lanceolate, oblanceolate, linear-oblong, or spatulate, 8–35(–40) × (2–)4–8 mm, densely white cottony abaxially, less so or ± glabrous adaxially, sometimes much narrowed into a sessile base, margin entire, undulate, dentate, or shallowly lobed, apex obtuse or subobtuse. Peduncles erect, 20–70(–80) mm, covered with white cottony wool, bearing a single capitulum. Capitula 8–12(–14) mm in diam., multiflorous. Phyllaries many seriate, densely floccose-lanate; outer phyllaries subulate to narrowly lanceolate, 2–2.5 × ca. 0.5 mm; middle phyllaries subulate to narrowly lanceolate, 3–3.5 × ca. 0.5 mm, gradually narrowed into an acicular point with entire margin, apex ± opaque; inner phyllaries subulate, 6–7 × ca. 0.5 mm, long acuminate. Bisexual florets tubular, 5–6
mm, tube ± glabrous, lobes small, ± rounded, ± hairy at tips. Anthers included to subexserted, not at all caudate at base. Style included to subincluded, bifid, stigma rounded, papillose. Achenes compressed, ca. 1 mm, sparsely hairy. Pappus setae 5, 4–5 mm, barbellate almost to base. Fl. May–Aug. 2n = 18.

Valleys; 1800–2700 m. W Xizang [Afghanistan, India, Kashmir, Nepal, Pakistan].


合冠鼠麴草属 he guan shu qu cao shu
Chen Yousheng (陈又生); Randall J. Bayer

Herbs, annual or perennial. Leaves alternate, flat, tomentose on both surfaces, with entire margins. Capitula disciform, usually in glomerules borne in continuous or interrupted spiciform, sometimes paniculiform, arrays. Phyllaries brownish, papery; stereome undivided. Receptacle flat, epaleate. Outer florets purple, filiform. Central florets bisexual, purple. Anthers with flat appendages. Style branches truncate, with hairs apically. Achenes oblong, with globose twin hairs. Pappus bristles capillary, barbellate, connate into a ring.

About 53 species: Caribbean, Central, North, and South America, some species adventive and naturalized in Asia, Australia, Europe, and elsewhere; seven species (one endemic, three introduced) in China.

1a. Plants usually branched; basal leaves usually withered at anthesis; upper leaves similar to lower leaves.
2a. Blade of basal and proximal cauline leaves 2–6 mm wide; bracts among capitula linear, oblanceolate, or oblong-oblanceolate, surpassing glomerules or not ................................................................. 1. G. calviceps
2b. Blade of basal and proximal cauline leaves 4–18 mm wide; bracts among capitula spatulate to oblanceolate, at least proximal ones surpassing glomerules .................................................................................. 2. G. pensylvanica
1b. Plants usually unbranched; basal leaves usually persistent; upper leaves gradually smaller than lower leaves.
3a. Bracteal leaves short, spatulate to oblong; leaves spatulate-oblong, apex obtuse.
4a. Leaves adaxially glabrous or glabrate; involucre 2.5–3 mm, base glabrous; outer phyllaries elliptic-ovate to broadly ovate-elliptic, apices rounded to obtuse; bisexual florets 2 or 3 .................................................................. 3. G. coarctata
4b. Leaves adaxially sparingly arachnoid (hairs persistent, evident); involucre 3–4.5(–5) mm, base (imbedded in tomentum) often sparingly arachnoid on proximal 1/5–1/2; outer phyllaries ovate, ovate-triangular, or ovate-lanceolate, apices acute to acuminate; bisexual florets 3 or 4 .......................... 4. G. purpurea
3b. Bracteal leaves distinct, linear; leaves linear, filiform, or linear-lanceolate, apex acute to acuminate.
5a. Leaves usually 3-veined .................................................................................................................................. 5. G. norvegica
5b. Leaves 1-veined.
6a. Leaves linear or linear-lanceolate, 5–8 mm wide; spikes long and loose; involucre 3–5 mm in diam. ........................................................................................................................................ 6. G. sylvestrica
6b. Leaves linear or filiform, 1–3 mm wide; spikes short and dense; involucre 2–3 mm in diam. ...... 7. G. nanchuanensis


直茎合冠鼠麴草 zhi jing he guan shu qu cao

Gnaphalium calviceps Fernald, Rhodora 37: 449. 1935 ['calvescens'].
linear-oblong, ca. 3 mm, apex rounded to shortly acute. Outer florets ca. 100; corolla ca. 2.25 mm. Central florets 2 or 3; corolla ca. 2.25 mm. Achenes brown, elliptic, ca. 0.5 mm, minutely glandular. Pappus white, ca. 2.3 mm, connate at base into a ring. Fl. Jan–May. 2n = 28.

Waste fields, roadsides; below 1500 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Africa, Asia, Australia, Central and South America, Europe, North America (Mexico)].


里白合冠鼠麴草 里bai he guan shu qu cao


Herbs, winter annual or biennial, 15–35(–50) cm tall, fibrous rooted. Stems ascending, white pannose. Leaves basal and cauline, basal leaves in rosettes, present at anthesis, blades bicolor on both surfaces, spatulate to oblanceolate-obovate, (1.5–)3–8(–12) cm × 6–15(–22) mm, abaxially closely white pannose, axially glabrous or glabrate; leaves distally gradually smaller, slightly succulent, margin often crenulate on drying. Capitula initially in dense, continuous, pressed spiciform arrays 2–20 cm × 10–14 mm, later branched, interrupted. Involucrile cylindric-campanulate, 2.5–3 mm, base glabrous; phyllaries 4–5-seriate; outer ones purplish or rosy, elliptic-ovate to broadly ovate-elliptic, 1/4–1/3 as long as inner ones, apices rounded to obtuse; inner ones oblong, laminae brown hyaline, apices rounded to obtuse or blunt, apiculate. Bisexual florets 2 or 3. Corollas of all florets usually purplish distally. Achenes oblong-elliptic, 0.5–0.6 mm. Pappus white, ca. 2.5 mm, connate at base into a ring, deciduous. Fl. Apr–Jun. 2n = 28.

Waste fields, roadsides, ditches; 400–1400 m. Naturalized in Guizhou and Taiwan [native to South America; widely introduced in Asia, Caribbean, Europe, North America, Oceania, Pacific islands].

The present report of this species is its first record in mainland China.


合冠鼠麴草 合bian he guan shu qu cao


Herbs, annual or biennial. Stems erect to decumbent-ascending, unbranched or 1 or 2 branched from base, 10–40 cm tall, densely but loosely pannose or pannose-tomentose. Leaves basal and cauline, basal and proximal cauline in rosettes, whithered but persistent at anthesis; blades oblanceolate to spatulate, 1–6 cm × 5–14 mm, upper ones smaller, both surfaces usually bicolor, abaxially closely white pannose, axially usually sparsely arachnoid (basal cells of hairs persistent, expanded, glasy), sometimes glabrescent. Capitula initially in continuous spiciform arrays 1–4(–5) cm × (5–)10–15 mm, later interrupted, glomerules widely separated, bracteate, proximal often on relatively long peduncles. Involucre turbinate-cylindric, 3–4.5 mm, base sparsely arachnoid; phyllaries 4–5-seriate, outer ovate-triangular, length 1/3–2/3 of inner, apices acute-acuminate; inner triangular-lanceolate (usually striate), laminae purplish (in bud) to whitish or silvery (in fruit), apices acute (not apiculate). Bisexual florets 3 or 4. Corollas of all florets usually purplish distally. Achenes oblong, 0.6–0.7 mm. Pappus connate into a ring, ca. 2.5 mm. Fl. Apr–May. 2n = 14, 28.

Waste fields at low elevations. Introduced in Taiwan [native to North America; introduced in Asia, Europe, and South America].

5. _Gamochaeta norvegica_ (Gunnerus) Y. S. Chen & R. J. Bayer, comb. nov.

挪威合冠鼠麴草 nuo wei he guan shu qu cao


Herbs, perennial, 10–40 cm tall. Rhizome cylindric, thin, mainly 2–3 mm in diam. Stems solitary, very rarely 2 or several, erect, gray tomentose pubescent, relatively sparsely foliate. Leaves lanceolate, upper ones sessile or sub sessile, middle ones with attenuate base, to a long petiole; blade greenish and not densely arachnoid tomentose adaxially, gray-green or more often gray and rather dense arachnoid tomentose or floccose-tomentose abaxially, at least in lower leaves, in which broadest part of lamina usually reaches 8–12 mm in width, 3 veins clearly distinct. Capitula narrowly campanulate, 5–8 × 4–7 mm, aggregated at stem apex to form a dense compact spiciform synflorescence, with apical leaves usually prominent. Phyllaries 20–25, mostly 3-seriate; outer ones ovate, shorter than inner ones; inner ones lanceolate or oblong, abaxially green below, in upper part and at margin brown or fuscous, membranous (scari ous). Florets usually 35–45 per capitulum, of which bisexual ones are few (usually 4 or 5). Achenes brown, cylindric, ca. 1.5 mm, distinctly costate, with short white (transparent) hairs. Pappus very thin, basally united into a ring, silky white with slightly crenate hairs, approximately as long as corolla. Fl. Jul–Sep. 2n = 56.

Alpine meadows. Xinjiang [Russia; Europe, North America].


林地合冠鼠麴草 lin di he guan shu qu cao


Herbs, perennial. Rhizome short. Stems 20–60 cm tall, mainly solitary or a few, whitish or gray tomentose or pubescent. Leaves green or rarely gray-green, linear or linear-lanceolate, 5–8 mm wide, subglabrous or ± appressed pilose adaxially, vein 1. Capitula cylindric or campanulate, 5–7 × 3–5 mm, arranged in axes of leaves and aggregated at apex in compound spiciform synflorescences; upper leaves usually inconspicuous
Herbs, perennial, 30–40 cm tall. Stems solitary, gray tomentose pubescent, densely foliate. Basal leaves caespitose, withering before anthesis; cauline leaves linear, 4–6 cm × 2–3 mm, abaxially white lanate, adaxially green and sparsely pubescent, vein 1, base narrow, apex acute. Capitula 2–3 mm in diam., aggregated at apex to form a dense compact spiciform synflorescence 3–5(–8) cm; apical leaves prominent. involucre ca. 5 × 2–3 mm; phyllaries 3- or 4-seriate, yellowish brown, herbaceous, apical toothed; outer ones ovate, ca. 2 mm, apex brown; inner ones oblong, 3–5 mm, apex brown striped, membranous. Florets usually ca. 65 per capitulum. Female florets ca. 60; corolla filiform, 3–4 mm, apex 2- or 3-toothed, glabrous. Bisexual florets ca. 5; corolla tubular, 3–4 mm, limbs 5-toothed. Achenes cylindric, ca. 1 mm, sparsely white pubescent. Pappus white, ca. 3 mm, basally united into a ring, silky white with slightly crenate hairs. Fl. Jul.–Sep.

● Grassy slopes; 1800–2200 m. Chongqing, W Hubei.

火绒草属 huo rong cao shu

Chen Yousheng (陈又生); Randall J. Bayer

Herbs, rarely subshrubs, perennial. Stem with fibers in phloem, without resin canals, without pericyclic cambium. Leaves alternate, sessile, tomentose to villous, eglanular, margin flat, entire. Capitula heterogamous, disciform, in flat-topped terminal corymb, surrounded by a whorl of prominent, white lanate leaves. Receptacle flat, palesulate. Phyllaries papery, monomorphic, monochromous, brownish, transparent; sterile undivided. Female florets yellow, filiform, outnumbering disk florets. Disk florets functionally male; corolla yellow; corolla lobes erect, veins reaching apex of lobes. Anthers ecalcarate, with short tails; endothecial tissue polarized; apical appendage flat, as wide as thecae. Pollen gnaphaloid. Style bifid; style branches truncate with obtuse sweeping hairs dorsally, not reaching furcation; stigmatic surface separated. Achene in disk and female florets small, oblong, with 5 vascular bundles, sparsely hairy with short, clavate, not myxogenic, twin hairs; epidermis smooth. Pappus dimorphic, of basally conenate, barbellate, capillary bristles in 1 row; apical cells clavate in disk florets, acute in female. x = 7.

About 58 species: Asia, Europe; 37 species (17 endemic) in China.


1a. Pappus not white.
2a. Pappus purplish brown; corolla purplish brown at least in upper part; bracteal leaves linear-lanceolate or linear.
3a. Leaves linear-lanceolate or linear-oblongateolate, 3–10 mm wide; pappus purplesh brown, but yellow in lower part; corolla purplish brown at upper part; achenes ca. 1.8 mm ................................................................. 1. L. giraldii
3b. Leaves linear or linear-lanceolate, 2–4 mm wide; pappus deep purplish brown throughout; corolla purplish brown above; achenes less than 1 mm ....................................................................................... 2. L. villosum
2b. Pappus yellowish brown; corolla yellow or purplish red; bracteal leaves oblong-lanceolate or absent.
4a. Sparse erect herbs; bracteal leaves oblong-lanceolate ................................................................. 3. L. forrestianum
4b. Compact pulvinate herbs; bracteal leaves absent ........................................................................... 4. L. aurantiacum
1b. Pappus white or rarely red.
5a. Compact pulvinate herbs; bracteal leaves absent ........................................................................... 5. L. haastitoides
5b. Erect herbs or subpulvinate herbs; bracteal leaves present.
6a. Pappus and corolla red above ........................................................................................................... 6. L. roseum
6b. Pappus white; corolla yellow or white.
7a. Stems and leaves adaxially densely yellow or brown glandular hairy, or leaves with arachnoid pubescence.
8a. Leaf blade linear-lanceolate, basally gradually narrowed, both surfaces with grayish or greenish arachnoid pubescence ........................................................................................................... 7. L. haplophylloides
8b. Leaf blade base cordate, auriculate, or narrower, abaxially densely white arachnoid tomentose.
9a. Leaf blade linear or spatulate-lanceolate, veinlets indistinct.
10a. Perennial herbs; stems not branched; leaves 10–35 × 1–3 mm ............................................. 8. *L. franchetii*

10b. Subshrubs; stems many branched; leaves 3–10 × 0.5–1.5 mm ............................................... 9. *L. suffruticosum*

9b. Leaf blade ovate-lanceolate or lanceolate, margin even or undulate, veinlets distinct.
11a. Stems herbaceous or subwoody at base; leaf blade base cordate; bracteal leaves ovate-lanceolate ... 10. *L. stracheyi*

11b. Stems woody; leaf blade base narrowed or slightly auriculate; bracteal leaves lanceolate or long lanceolate ........................................................................................................... 11. *L. artemissifolium*

7b. Stems and leaves white, gray, or yellowish arachnoid pubescent, without glandular hairs.
12a. Leaf base ampiolate and cordate, sagittate, or truncate ............................................................. 12. *L. dedekensii*

12b. Leaf base narrowed or not, or rarely auriculate.
13a. Subshrubs; stems woody, usually branched ........................................................................... 13. *L. sinense*

13b. Perennial herbs; stems herbaceous or woody at lower part, usually not branched.
14a. Cauline leaves not sheathing at base.
15a. Rhizome shortly branched, usually without relics of old leaves; stems branched or not branched; synflorescence usually in compound corymbi. ...................................................... 14. *L. japonicum*

15b. Rhizome long branched, densely covered with relics of old leaves above; stems not branched; synflorescence usually solitary.
16a. Rhizome and suckers sparsely arranged; bracteal leaves subequal but usually broader than cauline leaves.
17a. Flowering stems 12–42 cm tall; achenes glabrous ........................................................................ 15. *L. wilsonii*

17b. Flowering stems 5–10(–18) cm tall; achenes papillose .............................................................. 16. *L. omeiense*

16b. Rhizome and suckers densely arranged and tufted; bracteal leaves distinctly broader than cauline leaves.
18a. Leaves linear or subulate, 8–30 × 0.8–1.4 mm, margin reflexed, adaxially usually green and glabrescent ......................................................................................................................... 17. *L. andersonii*

18b. Leaves oblanceolate, 7–12 × 1.5–2 mm, margin not reflexed, densely whitish lanate on both surfaces ................................................................................................................... 18. *L. microphyllum*

14b. Cauline leaves or some of them sheathing at base.
19a. Bracteal leaves larger than cauline leaves; capitula solitary ..................................................... 19. *L. monocephalum*

19b. Bracteal leaves subequal to cauline leaves, or slightly wider; capitula usually numerous, very rarely solitary.
20a. Plants pulvinate; leaves linear-lanceolate, 6–10 × 0.5–1 mm ..................................................... 20. *L. muscoides*

20b. Plants caespitose with long stems, or pulvinate, or stem solitary; leaves linear-lanceolate, linear-spatulate, or spatulate, usually longer and wider.
21a. Plants caespitose or pulvinate; rhizome stout, with numerous suckers, without sterile rosette stems, or if sterile rosette stems present then leaves spatulate.
21b. Plants caespitose or stem solitary; rhizome slender, usually with sterile rosette stems.
22a. Leaves lanceolate or linear-lanceolate, rarely elliptic; capitula 4–5 mm in diam.; bracteal leaves distinct and forming a star.
22b. Leaves spatulate; capitula 4–13 mm in diam.; bracteal leaves indistinct.
23a. Sheaths as wide as leaf ............................................................................................................. 21. *L. delavayanum*

23b. Sheath narrower than leaf.
24a. Leaves oblanceolate-oblong or oblanceolate, 7–15 × 2–6 mm; flowering stems 1–7 cm tall ......................................................................................................................... 22. *L. fanglingense*

24b. Leaves linear-lanceolate or lanceolate, 6–25 × 1–3 mm; flowering stems 6–28 cm tall.
25a. Plants stoloniferous, stolons slender, elongate, usually branched, terminated by a loose rosette of leaves; achenes pubescent ............................................................................................................. 23. *L. jacotianum*

25b. Plants not stoloniferous; stems erect, caespitose, usually not branched; achenes glabrous .............................................................................................................................. 24. *L. caespitosum*

26a. Bracteal leaves numerous, large, forming an irregular star.
27a. Stem 1–5 cm; capitula (1–)3–7 .................................................................................................. 25. *L. pusillum*

27b. Stem 6–10 cm; capitula 3–5 ..................................................................................................... 26. *L. brachyactis*

26b. Bracteal leaves few, smaller, not forming a star.
28a. Plants pulvinate; capitula 6–15 mm in diam. ............................................................................. 27. *L. nanum*

28b. Plants caespitose; capitula ca. 4–5 mm in diam. ...................................................................... 28. *L. stoloniferum*

21b. Plants caespitose or stem solitary; rhizome slender, usually with sterile rosette stems.
29a. Upper cauline leaves base broadened, usually surrounding stem.
30a. Cauline leaves linear or lingulate-linear, 1–4 cm; bracteal leaves 9–14, 10–20 × 1.5–3 mm, forming a star of 2–3 cm in diam. ................................................................. 29. *L. souliei*
Phyllaries

30b. Cauline leaves lanceolate or linear-lanceolate, 5–15 cm; bracteal leaves 10–18, 20–45 × 3–6 mm, forming a multiradiate star of 5–8 cm in diam. ....................... 30. L. calocephalum

29b. Upper cauline leaves base narrowed or not, not surrounding stem.

31a. Bracteal leaves lingulate, usually broader at base, apex acute to acuminate ........ 31. L. himalayananum

31b. Bracteal leaves lanceolate or ovate, rarely linear, apex acute or obtuse.

32a. Leaves adaxially usually green and glabrescent ................................. 32. L. jumelianum

32b. Leaves grayish arachnoid tomentose on both surfaces.

33a. Plants usually 5–10 cm tall, usually with dense sterile rosettes; leaves oblong, lingulate, lanceolate, or linear-lanceolate ........................................... 33. L. ochroleucum

33b. Plants usually 15–35 cm tall, not forming dense clusters; leaves lanceolate, linear-lanceolate, or oblanceolate.

34a. Bracteal leaves ovate-lanceolate, broadened at base, abaxially light green ..... 34. L. conglobatum

34b. Bracteal leaves oblong or linear, base not broadened, abaxially gray or whitish.

35a. Bracteal leaves linear with acuminate apex, forming a distinct star; phyllaries ca. 4 mm ................................................................. 35. L. campestre

35b. Bracteal leaves oblong, linear-lanceolate, or rarely linear, not forming a regular star; phyllaries 4.5–6 mm.

36a. Bracteal leaves few, not forming a star ............................................... 36. L. leontopodioides

36b. Bracteal leaves forming an irregular star ........................................... 37. L. smithianum


楚岭火绒草  qin ling huo rong cao

Herbs, perennial. Rhizome stout and branched, densely covered with black-brown relics of leaves, forms rather caespitose of several stems and sterile leaf rosettes. Stems erect and firm, 10–28 cm tall, ash-colored arachnoid lanate. Leaves discolored on both sides, abaxially densely white arachnoid lanate, adaxially greenish glabrate; cauline leaves linear-lanceolate or oblong-lanceolate, 30–90 × 3–10 mm, base narrowed, apex obtuse or acute, basal ones usually larger than upper ones; radial rosette leaves oblong-spuritate or narrowly oblong, 20–50 × 5–8 mm, narrowed in sheath. Capitula 5–9, heterogamous, in sparse corymbs, 6–8 mm in diam.; peduncles ca. 1 cm, connate with base of bracteal leaves; bracteal leaves similar to upper cauline leaves in shape, size, and indumentum, but slightly narrower, forming an irregular star of 6–8 cm in diam. Phyllaries 3- or 4-seriate, oblong, ca. 4 mm, abaxially densely white tomentose, appendapressed, obtuse or lacerate, glabrous. Corolla ca. 3 mm, purplish brown. Achenes less than 1 mm, glabrous. Pappus purplish brown, ca. 4 mm, serrulate. Fl. Aug.

- Alpine meadows; ca. 4000 m, Sichuan (Baoxing).

This is a very rare and distinct species. It is similar to Leontopodium giralidii in its purplish brown florets and pappus but differs in its leaves narrower and longer, pappus purplish brown in all parts, and achenes smaller.


柔毛火绒草  rou mao huo rong cao

Herbs, perennial. Rhizome short, with dense rosette leaves in upper part and a flowering stem. Stems erect, 20–32 cm tall, grayish arachnoid pubescent. Basal leaves oblong-lanceolate to linear-lanceolate, 1.7–4 × 3–4 mm, abaxially densely grayish arachnoid tomentose, adaxially sparsely grayish arachnoid pubescent; upper leaves longer, linear, 3–45 × 2–4 mm, abaxially densely grayish arachnoid tomentose, adaxially green and sparsely grayish arachnoid pubescent or glabrescent, margin reflexed. Capitula 5–10, densely congested, 4–5 mm in diam.; bracteal leaves 12–15, similar to upper leaves in shape, size, and indumentum. Involucre 4–5 mm, outer side densely grayish arachnoid pubescent; phyllaries 3-seriate, apical red-brown, obtuse and lacerate, glabrous. Corolla ca. 3 mm, upper part purplish brown. Achenes less than 1 mm, glabrous. Pappus purplish brown, ca. 4 mm, serrulate. Fl. May–Aug, fr. Jul–Sep.

- Subalpine stony scree slopes, grasslands; 2000–3200 m, Shaanxi (Taibai Shan).

This is a distinct and very rare species endemic to China.


巖巖火绒草  shu qu huo rong cao

Herbs, perennial. Rhizome slender, with numerous flowering and sterile stems. Stems slender, erect, 2–10 cm tall, simple or branching at base, entire plant gray silky or ash-colored lanate and equally leafy. Leaves linear or oblong to oblanceolate, 8–11 × 1.5–2.5 mm, abaxially white or ash-colored lanuginous, adaxially yellowish green and arachnoid, base narrowed, apex obtuse or acute. Capitula 2 or 3(–7), 5–7 mm in diam., in dense corymbs, or solitary; bracteal leaves numerous, as large as upper leaves or broader, abaxially densely white tomentose, adaxially sordid yellow tomentose. Involucre 3-seriate, abaxially yellowish pilose; phyllaries lanceolate, ca. 4 mm, apex brown and acute. Marginal florets female; corolla capillary. Disk florets male; corolla subtubular, ca. 3.5 mm. Achenes papillose. Pappus of capillary bristles, yellowish. Fl. Jul–Sep, fr. Sep–Oct.

Alpine grasslands, gravelly slopes, thickets; 3500–3800 m, NW Yunnan [Myanmar].

This is a very rare and distinct species related to the genus Gnaphalium.

**密垫火绒草 mi dian huo rong cao**

Herbs, perennial, pulvinate, ca. 2 cm tall. Rhizome slender and many branched. Stems numerous, usually shortly branched, with several leaves in middle and rosette leaves at apex, forming a mat of 12–60 cm in diam., entire plant densely brownish yellow tomentose. Leaves obovate or spatulate-ovate, 4–5 × 2–2.5 mm, both surfaces densely brownish yellow tomentose, base narrowed, apex acute. Capitula solitary, heterogamous or dioecious, ca. 5 mm in diam.; bracteal leaves 8–12, obovate, similar to cauline leaves in shape and size but densely covered with distinct brownish yellow tomentum, surrounded by rosette of several cauline leaves, apex acute. Phyllaries lanceolate, 4–4.5 × ca. 1.5 mm, abaxially brownish tomentose, with acute, often lacerate apex of dark brown color. Corolla orange-yellow, ca. 3 mm. Achenes ca. 0.5 mm, shortly pilose. Pappus yellow to brownish yellow, 3–4 mm. Fl. Jun–Jul.


**密垫火绒草 mi dian huo rong cao**

This is a very rare and distinct species.


**红花火绒草 hong hua huo rong cao**

Herbs, perennial, forming dense cushions up to 10 cm in diam. Rhizome slender and many branched. Shoots numerous, 1.5–3 cm tall, shortly columnar, with closely imbricate leaves. Leaves spatulate or oblong, 2–6 × 1–2 mm, basal part appressed, thin, scarious, abaxially sparsely arachnoid, distal part spreading, thickened, herbaceous, thickly grayish tomentose, apex rounded. Capitula solitary, dioecious or predominantly female, 3–4 mm in diam., ebracteate, immersed among leaves. Phyllaries lanceolate to oblanceolate, 4–6 × 0.6–2 mm, apex acute or obtuse, tips scarious, brownish. Corolla 3–4 mm. Achenes ca. 1.2 mm, papillose or glabrous; male ovary glabrous. Corolla ca. 3 mm, densely grayish arachnoid tomentum; phyllaries 3- or 4-seriate, apex brown, acute, glabrous. Corolla ca. 3.5 mm. Achenes papillate. Pappus white, 3–4 mm, serrulate. Fl. Aug–Sep, fr. Sep–Oct.


**红花火绒草 hong hua huo rong cao**

Herbs, perennial. Rhizome short and densely branched, with numerous flowering stems and sterile stems. Stems erect, not branched, 15–30 cm tall, woody in lower part, ash-colored arachnoid pubescent, equally densely leafy, lower leaves usually withering during anthesis; internodes 5–8 mm. Leaves lanceolate to linear-lanceolate, 10–40 × 1–3.5 mm, both surfaces grayish arachnoid pubescent, basally narrowed, apex acuminate or acute. Capitula 5–7, in dense corymbs, ca. 5 mm in diam.; bracteal leaves numerous, lanceolate, forming a star of 2–5 cm in diam., abaxially concolorous with cauline leaves, adaxially densely white tomentose. Involucre ca. 5 mm, densely grayish arachnoid tomentum; phyllaries 3- or 4-seriate, apex dark brown, acute, glabrous. Corolla ca. 3.5 mm. Achenes papillate. Pappus white, 3–4 mm, serrulate. Fl. Aug–Sep, fr. Sep–Oct.


**红花火绒草 hong hua huo rong cao**

This is a very rare and distinct species.


**亚灌木火绒草 ya guan mu huo rong cao**

Subshrubs. Bark yellowish brown, scaly. Stems light brown, woody, erect, 20–30 cm tall, several branched from base and middle, white arachnoid pubescent or sometimes glabres-
cent. Leaves linear-spatulate or linear, 3–10 × 0.5–1.5 mm, both surfaces white arachnoid tomentose and glandular, apex obtuse or acute. Capitula 3–(7), heterogamous or dioecious, densely congested; bracteal leaves few, linear, 5–8 mm, forming a star of ca. 1.5 cm in diam. Involucre hemispheric, ca. 3 mm, glandular or sparsely arachnoid tomentose; phyllaries 2- or 3-seriate, apex light brown or dark brown, acute or obtuse, glabrous. Corolla yellow, 2–3 mm. Achenes sparsely pubescent. Pappus white, slightly longer than corollas. Fl. Jun, fr. Aug.

- Grass margins; ca. 3200 m. E Xizang.

This species is similar to *Leontopodium franchetii* but differs by its subshrubby habit; branchlets numerous, old branches woody, covered with white to grayish white tomentose pubescence and remains of withered leaves; leaves and bracteal leaves much shorter, 5–7 mm; and bracteal leaves and capitula fewer.


毛香火绒草 mao xiang huo rong cao


Herbs, perennial. Rhizome stout, branched, with numerous flowering and sterile stems. Stems subwoody, erect, usually not branched, (5–)12–60 cm tall, glandular and sometimes arachnoid pubescent; internodes (3–)5–10 mm. Leaves narrowly branched, (5–)12–60 cm tall, glandular and sometimes arachnoid pubescent and glandular, covered with white to grayish white tomentose pubescence, and remains of withered leaves; leaves and bracteal leaves much shorter, 5–7 mm; and bracteal leaves and capitula fewer.


艾叶火绒草 ai ye huo rong cao


Herbs, perennial. Stems several, woody, erect, not branched, 25–60–(100) cm tall, sparsely covered with brown decayed leaves in lower part, entire stem glandular pilose, upper part usually covered with arachnoid hairs. Leaf veins 19–35, oblong-lanceolate, 20–50 × 5–8 mm, abaxially pale white and densely tomentose, adaxially green and covered with sparse short glandular hairs, base narrowed, apex acute with a short mucro. Capitula usually 6–12 mm in diam., in dense corymb at ends of stems or in sparsely compound corymb; bracteal leaves 11–13, lanceolate, 10–30 × 2.5–6 mm, densely white tomentose. Involucre subglobose, 4–6 mm wide; phyllaries 2- or 3-seriate, abaxially densely tomentose, apex acute, glabrous and naked. Marginal florets female; corolla capillary, 3–4 mm; achenes ca. 1 mm, ± papillose. Disk florets bisexual; corolla subtubular, 3–4 mm, sterile. Pappus white, ca. 3 mm, serrulate. Fl. Aug–Sep, fr. Sep–Oct.

- Grasslands, forest margins, riverbanks; 2100–3200 m. Sichuan, N Yunnan.


戟叶火绒草 ji ye huo rong cao

*Gnaphalium dedekensii* Bureau & Franchet, J. Bot. (Morot) 5: 70. 1891; *G. leontopodium* Linnaeus var. *foliosum* Franchet; *Leontopodium dedekensii* var. *microcalathinum* Y. Ling; *L. foliosum* Beauverd; *L. futtereri* Diels; *L. hastatum* Beauverd; *L. micranthum* Y. Ling.

Herbs, perennial. Rhizome short and stout, with several to numerous stems. Stems 10–45 cm tall, not branched or rarely slightly branched, entire plant densely grayish arachnoid pubescent, equal and densely leafy. Leaves: lower ones usually larger than upper ones; blade linear-lanceolate, 10–40 × 1.3–6.5 mm, both surfaces densely grayish arachnoid pubescent, base cordate, sagittate, or truncate, apex obtuse. Capitula 5–30, heterogamous or dioecious, closely aggregated, 4–5 mm in diam.; bracteal leaves 14–20, 5–30 × 2–4 mm, forming a star of 2–5 cm in diam., densely whitish to yellowish arachnoid pubescent. Involucre 3–4 mm; phyllaries 3-seriate, spatulate-oblong, 3–4 mm, apex acute or rounded, glabrous, dry membranous. Corolla ca. 3 mm. Achenes papillose. Pappus white, 3–4 mm, serrulate. Fl. Jun–Jul, fr. Jul–Sep.

Grasslands, thickets, conifer forests; 1400–4100 m. Gansu, Qinghai, Sichuan, Xizang, Yunnan [Myanmar].


华火绒草 hua huo rong cao

*Gnaphalium nobile* Bureau & Franchet; *G. sinense* (Hemsley) Franchet (1892), not *G. chinense* Gandoger (1918); *Leontopodium arbusculum* Beauverd; *L. niveum* Handel-Mazzetti; *L. nobile* (Bureau & Franchet) Beauverd; *L. rosmarinoides* Handel-Mazzetti; *L. stoechas* Handel-Mazzetti; *L. stoechas* var. *micrus* Y. Ling.

Subshrubs. Rhizome stout, woody. Stems woody, numerous, 30–70 cm tall, usually branched, densely white tomentose. Leaves oblanceolat, (7–)15–65 × 2–7 mm, both surfaces densely yellowish tomentose, base sheathed, apex acute. Capitula 7–20, heterogamous, in 1 or usually 2–5 corymb, 3–8 mm in diam.; bracteal leaves 5–9, similar to cauline leaves but usually much larger, sparsely arranged, forming an irregular star of 2.5–7.5 cm in diam. or usually in compound stars. Involucre 3–4 mm, white lanate; phyllaries 3-seriate, inner ones oblanceolat, apex light brown, obtuse, glabrous. Corolla 2.5–3 mm. Achenes ca. 1 mm, papillose. Pappus white, longer than corolla, serrulate. Fl. Jul–Sep, fr. Sep–Nov.

Herbs, perennial, from tufted rhizomes. Stems slender to rather stout, leafy throughout or only at apex, erect, 10–55 cm tall, 1–3 mm in diam.; internodes 4–20(–40) mm. Leaves (10–)20–30, mainly cauleine; middle leaves ovate to linear, 15–80 × 3–15 mm, abaxially whitish lanate, adaxially green and glabrous or thinly lanate, base abruptly narrowed, apex acute to acuminate. Capitula several, arranged in dense or sparse terminal corymbs, 3–4.5 mm in diam.; bracteal leaves 5–8, loosely arranged, ovate to oblong-lanceolate, 10–30 × 3–8 mm, smaller than upper leaves, adaxially sordid yellow tomentose. Involutre subglobose, 4–5 × 3.5–4.5 mm; phyllaries 3-seriate, densely hairy abaxially, apex acuate or acuminate. Marginal florets female; corolla capillary, ca. 2 mm; achenes ca. 1 mm, ± papillose. Disk florets bisexual; corolla subtubular, ca. 3 mm, sterile. Pappus white, ca. 3.5 mm. Fl. Jun–Sep, fr. Sep–Oct.

Forests, thickets, grassey, or dry slopes, gravelly areas, open rocks; 700–2300 m. Anhui, Gansu, Henan, Hubei, Jiangsu, Shanxi, Sichuan, Zhejiang [Japan].

14a. Leontopodium japonicum var. japonicum

Leontopodium japonico (Handel-Mazzetti) Y. S. Chen, var. nov.


14b. Leontopodium japonicum var. xerogenes (Handel-Mazzetti) Y. Ling.


14c. Leontopodium japonicum var. saxatile Y. S. Chen, var. nov.

Herbs, perennial. Stems somewhat slender, 1–2 mm in diam., densely leafy throughout; internodes 4–8 mm. Leaves ovate to oblong-ovate, 20–30 × 6–11 mm longis latissimis, capitula in corymbos densissimis dispositis atque foliis bracteis oblongis ovatis 10–12 mm longis 5–7 mm latis differt.

Type: China. Zhejiang: Lin’an Xian, Changhua, Longtang Shan, Qingliang Feng, on rocks, alt. 1750 m, 8 Sep 1959, Zhejiang Plant Resources Expedition 29803 (holotype, PE).


Herbs, perennial. Stems woody, erect, not branched, 12–42 cm tall, entire plant light gray tomentose, densely arranged with leaves in upper part, densely covered with brown decayed leaves in lower part. Leaves linear-lanceolate, 24–35 × 2–2.8 mm, abaxially densely covered with light gray tomentum, adaxially green, light gray pilose, lateral veins indistinct, base narrowed, apex acute. Capitula 7–11, dioecious or heterogamous, 4–5 cm in diam.; bracteal leaves 15–20, densely arranged, oblong, larger than upper leaves, forming a star of 4–5.5 cm in diam., both surfaces densely grayish white tomentose, apex glabrous. Phyllaries 2- or 3-seriate, ovate, ca. 4 mm, apex obtuse, abaxially white tomentose, black-brown adaxially. Corolla ca. 3 mm. Achenes oblong, ca. 1 mm, glabrous. Pappus white, ca. 3 mm, serrulate. Fl. Jun–Aug, fr. Sep–Oct.

Leontopodium microcephalum (Handel-Mazzetti) Y. Ling.


Herbs, perennial. Stems woody, erect, not branched, 12–42 cm tall, entire plant light gray tomentose, densely arranged with leaves in upper part, densely covered with brown decayed leaves in lower part. Leaves linear-lanceolate, 24–35 × 2–2.8 mm, abaxially densely covered with light gray tomentum, adaxially green, light gray pilose, lateral veins indistinct, base narrowed, apex acute. Capitula 7–11, dioecious or heterogamous, 4–5 cm in diam.; bracteal leaves 15–20, densely arranged, oblong, larger than upper leaves, forming a star of 4–5.5 cm in diam., both surfaces densely grayish white tomentose, apex glabrous. Phyllaries 2- or 3-seriate, ovate, ca. 4 mm, apex obtuse, abaxially white tomentose, black-brown adaxially. Corolla ca. 3 mm. Achenes oblong, ca. 1 mm, glabrous. Pappus white, ca. 3 mm, serrulate. Fl. Jun–Aug, fr. Sep–Oct.

峨眉火绒草 e mei huo rong cao

Herbs, perennial. Rhizome slender and usually branched, subwoody, erect or procumbent, densely covered with brown decayed leaves with dense radical rosettes of sterile leaves and numerous filiform radicals. Stems solitary or 3 or 4, usually 5–10 cm tall, not branched, with 5–15 leaves, entire plant light gray tomentose, but subglabrous on abaxial surface of leaves; stems sometimes not developed and plant forming sessile heads, not exceeding ca. 3 cm in height. Leaves lanceolate, lanceolate-oblong, or oblong-spatulate, 20–25 × 2.5–4.5 mm, abaxially white and densely covered with light gray tomentum, adaxially covered with sparse light gray tomentum, apex obtuse or acute. Corolla ca. 3 mm; corolla of male floret funnelform; calyx ca. 3 × 4 mm; phyllaries 3-seriate, subequal, oblong, white, apex acute or obtuse. Phyllaries ca. 3-seriate, ovate, ca. 4 mm, apex obtuse, abaxially often green, brown to almost black adaxially. Corolla of outer florets ca. 2.5 mm; corolla of central florets tubular, ca. 2.5 mm. Achenes oblong, ca. 1 mm, glabrous or papillose. Pappus bristles white, ca. 2.5 mm. Fl. Jul–Sep.

17. Leontopodium andersonii C. B. Clarke, Compos. Ind. 100. 1876.

松毛火绒草 song mao huo rong cao

Gnaphalium andersonii (C. B. Clarke) Franchet; G. subulatum Franchet; Leontopodium bonatii Beauverd; L. subulatum (Franchet) Beauverd; L. subulatum var. bonatii (Beauverd) Handel-Mazzetti.

Herbs, perennial. Rhizome short and stout, branched, subwoody, erect or procumbent, densely covered with black-brown relics of leaves. Stems 5–30 cm tall, erect, 1–3 mm in diam., usually not branched, white sericeous, with leaves densely arranged; leaves much denser in sterile young stems. Leaves linear to subulate-linear, 8–30 × 0.8–1.4 mm, abaxially densely white tomentose, adaxially green and sparsely arachnoid or subglabrous, margin reflexed, apex acute or obtuse. Corolla 3.3–4.2 mm. Achenes pubescent. Pappus of capillary bristles, white. Fl. Jul–Aug.

Dry grasslands, sparse forests, gravelly slopes, waste fields; 1000–3600 m. Guizhou, Sichuan, Yunnan [Laos, Myanmar].


小叶火绒草 xiao ye huo rong cao

Herbs, perennial. Stems slender, slightly woody, branched; branches procumbent at base, densely lanate. Cauline leaves oblong-lanceolate, 7–12 × 1.5–2 mm, both surfaces densely whitish lanate, base abruptly narrowed, apex acute. Capitula 4–9; bracteal leaves 7–10, radiate, generally unequal, linear-lanceolate, 6–12 × 1.5–2 mm, densely white lanate. Involucre hemispheric, ca. 3 × 4 mm; phyllaries 3-seriate, subequal, oblong, apex acute to obtuse. Corolla of outer florets ca. 2.5 mm; corolla of central florets tubular, ca. 2.5 mm. Achenes oblong, ca. 1 mm, glabrous or papillose. Pappus bristles white, ca. 2.5 mm. Fl. Jul–Sep.

Alpine meadows, thickets, Abies forests, rocky places; 4000–4200 m. SE Xizang, NW Yunnan.

云岭火绒草 yun ling huo rong cao

Herbs, perennial, pulvinate. Rhizome stout, prostrate, usually many branched, densely covered with brown relics of leaves. Stems numerous, erect, not branched, 6–13 cm tall, equally leafy, whitish arachnoid pubescent. Leaves lanceolate or oblong-lanceolate, 20–45 × 3–6 mm, both surfaces whitish arachnoid pubescent, more sparse adaxially, with 2 distinct lateral veins subparallel to midvein, base forming sparse sheaths surrounding stem, apex acute. Capitula 6–20, heterogamous or dioecious, closely aggregated, ca. 5 mm in diam.; bracteal leaves 11–16, linear-oblong, 10–25 × 3–7.5 mm, forming a multiradiate star of 4–6.5 cm in diam., both surfaces densely white or yellowish tomentose, base broad, apex acuminate. Involucre ca. 11–16, linear-oblong, 10–25 × 2–4 mm, densely grayish white tomentose, base broad, apex acute. Phyllaries 3-seriate, margin membranous, apex dark brown, acute, glabrous. Corolla ca. 3 mm. Achenes pubescent. Male ovaries pubescent or subglabrous, ca. 1 mm. Pappus white, plumose. Fl. Jul–Aug, fr. Sep.–Oct.

Alpine meadows, gravelly slopes; 2200–4400 m. S Xizang [Bhutan, India, Kashmir, Myanmar, Nepal, Pakistan].


丛生火绒草 cong sheng huo rong cao

Leontopodium jacotianum Beauverd var. caespitosum (Diels) Handel-Mazzetti; L. jacotianum var. minus (Beauverd) Handel-Mazzetti; L. wilsonii Beauverd var. minus Beauverd.

Herbs, perennial. Rhizome stout, long, usually branched, with numerous flowering stems and sterile stems. Stems woody, erect, branched or not branched, 12–25 cm, entire plant light gray arachnoid pubescent, densely arranged with leaves in upper part, densely covered with brown decayed leaves in lower part. Leaves lanceolate, 10–25 × 1.5–3 mm, abaxially densely covered with light gray tomentum, adaxially grayish green and glabrous, lateral veins indistinct, base narrowed, apex acute. Capitula 6–10, 4–5 cm in diam.; bracteal leaves 6–10, oblong, 14–30 × 2–4.5 mm, forming a star of 3–4.5 cm in diam., both surfaces densely grayish white tomentose, apex acute. Phyllaries 2- or 3-seriate, lanceolate, ca. 4 mm, apex black-brown and obtuse, abaxially white tomentose. Corolla ca. 3 mm. Achenes oblong, ca. 1 mm, glabrous. Pappus white, ca. 3.5 mm, serrulate. Fl. Jul–Aug, fr. Sep.–Oct.

Moist grasslands, alpine meadows, gravelly places; 3300–3600 m. SW Sichuan, NW Yunnan [Myanmar].


弱小火绒草 ruo xiao huo rong cao


Herbs, perennial, subpulvinate. Rhizome slender and many branched, with dense radical rosettes of sterile leaves and numerous flowering stems. Stems 2–7 cm tall, densely leafy, densely white tomentose. Leaves spatulate to oblong-spatulate; radical leaves 10–25 × 2–4 mm, cauline leaves 10–20 × 2–3 mm, both surfaces densely white tomentose, base narrowed, apex obtuse. Capitula (1–)3–7, densely congested, 5–6 mm in diam.; bracteal leaves numerous, similar to cauline leaves, congested, forming star of 1.5–2.5 cm in diam. Involucre 3–4 mm, abaxially white lanate; phyllaries 3-seriate, apex usually dark brown, acute, glabrous. Corolla 2.5–3 mm. Achenes glabrous or slightly papillose. Pappus white, serrulate. Fl. Jul–Aug, fr. Aug–Sep.
Alpine grasslands, rocky screes, gravelly slopes, salt lake banks and shores; 3500–5600 m. Qinghai, W Sichuan, Xinjiang, Xizang [India (Sikkim), Kashmir].


短星火绒草 duan xing huo rong cao

Herbs, perennial, stoloniferous, tomentose or somewhat glabrous; stolons ca. 10 mm, covered with dense brown scaly leaves. Stems many. Basal leaves in dense rosettes, spatulate, 30–40 × 3–5 mm, usually thickish, apex obtuse to subacute; cauline leaves (20–)30–40 × 3–4 mm, usually densely lanate-tomentose, 1-veined, apex shortly mucronate. Capitula 3–5, laxly arranged, 6–8 mm in diam., subtended by bracteal leaves similar to cauline leaves in color and pubescence, but forming a distinct star, obtusely lanceolate. Phyllaries brownish, ca. 5 × 1.5–1.7 mm, scarious with a lower greenish part, long pilose hairy, apex acuminate. Achenes of female florets larger than sterile ones of bisexual florets, ca. 1.5 mm. Pappus setae 4.5–5 mm, barbellate, deciduous as a unit. Fl. Jun–Aug.

Among rocks, open stony ground; 2200–4100 m. W Xizang [India, Kashmir, Nepal, Pakistan].

This is a relatively rare species in China; it is recorded as fairly common in Kashmir.


矮火绒草 ai huo rong cao

Antennaria nana J. D. Hooker & Thomson ex C. B. Clarke, Compos. Ind. 100. 1876.

Herbs, perennial, pulvinate, forming small clusters. Rhizome short, to 2 cm, densely covered with brown decayed leaves with dense radical rosettes of sterile leaves and numerous filiform radicals, rhizome emitting 1–5 creeping and branching brown scaly stolons up to 10 cm. Stems solitary, more rarely 2 or 3, usually to 5 cm tall, rarely higher, with 3–7 leaves, entire plant covered with light gray lax tomentum and violet below; stems often not developed at all and plant forming sessile heads, not exceeding 1.5–2 cm in height. Leaves long spatulate to spatulate-oblong; radical leaves to 20 × ca. 5 mm; cauline leaves erect, to 1.5 cm and narrower, equally pubescent on both sides. Capitula (1–)3–5, dioecious or heterogamous, very compact, 6–15 mm in diam.; bracteal leaves not different from cauline ones, erect, not exceeding capitulum, but more often shorter, not forming a star. Phyllaries lanceolate, ca. 6 mm, thinly acute and scarious at apex, brown to almost black, abaxially often green. Male florets with corolla ca. 4 mm, pappus ca. 6 mm; female florets with corolla ca. 6 mm, pappus 8–9 mm. Pappus white, slightly exceeding corollas and phyllaries and forming a prominent compact white cap. Fl. May–Jun, fr. Jun–Aug.

Alpine meadows, thickets, marshes; 2100–4500 m. Gansu, Shaanxi, Sichuan, Xinjiang, Xizang [Afghanistan, India, Kashir, Kazakhstan, Nepal, Pakistan].


匍枝火绒草 pu zhi huo rong cao

Herbs, perennial, caespitose. Rhizome branched, with stolons up to 7 cm, with rosette suckers and flowering stems. Stems erect, 3–14 cm tall, usually solitary and not branched, white tomentose; internodes 3–10 mm. Leaves on suckers spatulate-lanceolate, 10–20(–30) × 2.5–4.5 mm, both surfaces with dense white tomentum, apex obtuse; cauline leaves spatulate or spatulate-linear, 10–20 × 2–5 mm, both surfaces with dense white tomentum, apex obtuse. Capitula 3–6, densely congested, ca. 4 mm in diam.; bracteal leaves 6–10, similar to upper cauline leaves in shape, size, and indumentum, forming a star of 1.2–2.5 cm in diam. Involucre 4–5 mm, densely white arachnoid tomentose; phyllaries 2- or 3-seriate, obovate-lanceolate, apex dark brown, obtuse or lacerate, glabrous. Corolla ca. 3 mm. Achenes pubescent. Pappus white. Fl. Sep, fr. Oct.

● Moist streamsides; 2900–3600 m. W Sichuan (Dawa).

银叶火绒草 yin ye huo rong cao

Herbs, perennial. Rhizome prostrate, with 1 to several flowering stems and several sterile rosette suckers. Flowering stems slender, 6–25 cm tall, not branched, white arachnoid pubescent. Leaves on rosette suckers linear-lanceolate, usually larger than cauline ones, 15–40 × 1–3 mm, abaxially white arachnoid pubescent, adaxially green and glabrescent, apex acute; cauline leaves linear or lingulate-lanceolate, 10–40 × 1–3 mm, both surfaces white arachnoid pubescent, apex acute. Capitula 4–15(–20), 5–7 mm in diam.; bracteal leaves 9–14, oblong to oblong-lanceolate, 10–20 × 1.5–3 mm, both surfaces densely white arachnoid tomentose, forming a star of 2–3 cm in diam. Phyllaries 3-seriate, 3.5–4 mm, abaxially densely yellowish lanate, apex dark brown, obtuse, glabrous. Corolla 3–4 mm. Achenes pubescent or glabrous. Pappus white, ca. 4 mm, serrulate. Fl. Jul–Aug, fr. Sep.

● Grasslands, thickets, sparse forests; 2700–4500 m. Sichuan, Xizang, NW Yunnan.


美头火绒草 mei tou huo rong cao


Herbs, perennial. Rhizome slender, prostrate, usually branched. Stems erect, not branched, 10–50 cm tall, arachnoid pilose. Leaves lanceolate or linear-lanceolate, 50–150 × 2–12 mm, abaxially white tomentose, adaxially green and glabrous or sparsely pilose, lateral veins 2, distinct, subparallel to midvein, base forming sparse sheath around stem, apex acuminate. Capitula 5–20, heterogamous or dichious-dioecious, closely aggregated, 5–10 mm in diam.; bracteal leaves 10–18, linear, 20–45 × 3–6 mm, forming a multiradiate star of 5–8 cm in diam., both surfaces densely white or yellowish tomentose, base broader, apex acuminate. Involucre 4–6 mm, white tomentose; phyllaries 4-seriate, apex dark brown, acute or rounded, gla-

- Alpine meadows, grasslands, thickets, marshes, conifer forests, gravelly slopes, lake banks; 2600–4200 m. Gansu, Qinghai, Sichuan, Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Xizang [Kashmir].


珠峰火绒草 zhu feng huo rong cao

*Leontopodium himalayanum* var. *pumilum* Y. Ling.

Plant densely tufted, (3–)7–32 cm; offsets sheathed below by many old leaf bases, terminated by loose tuft of few leaves. Offset leaves linear- Spatulate, sometimes brown apiculate; cauline leaves linear to linear-lanceolate, 18–70 × 1–4 mm, grayish tomentose, apex acute or subobtuse, less often apiculate. Capitula crowded, (4–)7–12–(20), discoid or disciform; disciform capitula usually all similar, sometimes one central predominately male and remainder predominantly or entirely female; bracteal leaves lingulate, usually dilated at or near base or sometimes linear-lanceolate, basal half at least of upper surface more densely white or yellowish gray tomentose than leaves or very rarely villous, apex acute to acuminate, outer ones 12–40 × 2–7.5 mm. Synflorescence 3–7 cm in diam. Involucre 5–7 mm in diam.; phyllaries oblong, 3.5–6 × 1–2.5 mm, with black-brown scariosus margin. Corolla 3.3–4 mm. Achenes 1.5–2 mm, glabrous or sparsely pubescent; male ovaries always glabrous. Pappus white, ca. 4 mm. Fl. Jul–Aug.

Alpine gravelly slopes, meadows; 3000–5100 m. Xizang, NW Yunnan [Bhutan, India, Kashmir, Myanmar, Nepal, Pakistan].


长叶火绒草 chang ye huo rong cao

*Leontopodium junpeianum* Handel-Mazzetti, Acta Horti Gothob. 1: 115. 1924, not (Weddell) Bentham & J. D. Hooker (1873); *L. longifolium* Y. Ling; *L. linearifolium* Handel-Mazzetti.

Herbs, perennial. Rhizome shortly branching, densely covered with black-brown relics of leaves, forming tufts of numerous stems and sterile leaf rosettes, sometimes elongating into stolons up to 10 cm, often branching, and herbaceous brown scaly. Stems erect and firm, 5–15 cm tall, with 4–8 remote leaves, ash-colored arachnoid lanate or tomentose in upper half, sometimes glabrescent in lower half. Leaves concolorous, ash-colored lanate on both surfaces, sometimes greenish glabrate abaxially, without a distinct vein; cauline leaves oblong, lingulate, lanceolate, or linear-lanceolate, 10–250 × 2–4 mm, apex obtuse or acute; radical rosette leaves oblong-spatulate or narrowly oblong, 20–40 × 2–4.5 mm, narrowed to sheath. Capitula 5–7–(12), heterogamous and unisexual-dioecious, densely aggregated, 5–7 mm in diam.; bracteal leaves distinct, oblong-elliptic or lanceolate, forming rather regular multiradiate star of 1.5–2(–2.5) cm in diam., abaxially ash-colored lanate, axially loosely tomentose, pallid yellow, sometimes even ash- to sulfur-colored in dried plant. Phyllaries lanceolate, 4–5 mm, abaxially yellowish lanate or greenish, with prominent brown or almost black shiny apex. Corolla 3–4 mm. Achenes glabrous or papilllose. Pappus dirty white, in sterile bisexual florets 3–5 mm, in female florets 4–5 mm. Fl. May–Aug, fr. Jul–Sep.

Mountain tundra, humid or dry meadows, stony fields of slopes; 2200–5000 m. Qinghai, Xinjiang, Xizang [India, Kazakhstan, Mongolia, Russia].


团球火绒草 tuan qiu huo rong cao


Herbs, perennial. Rhizome short, with solitary stem or multicipital without stolons, with bundle of filiform radicals, forming small fasciculate clusters of 2 or 3 stems and sterile bundles of leaves. Stems erect and firm, (10–)15–30(–45) cm tall, ash-colored to grayish arachnoid pubescent, often subglabrous, violet or red-brown, equally and rather densely leafy.
Leaves linear-lanceolate to narrowly lanceolate and linear-spatulate; cauline leaves 2–6 cm × 2–10 mm, erect, lower ones long narrowed at base and often early marcescent; radical leaves in a rosette, green, linear, to 10 cm × 13 mm, pubescent to subglabrous. Synflorescence usually large, compact, corymbiform, often complexly branched, with a few separate capitula and more than 30 capitula closely aggregated into a group to 3 cm in diam., individual capitula homogeneous, 6–8 mm in diam.; bracteal leaves light green abaxially, more often greenish yellow to yellowish and light ash-colored adaxially, ovate-lanceolate or oblanceolate, flat, to 3 cm × 10 mm, forming a star of to 7 cm in diam., densely tomentose. Capitula heterogamous or diclinous-dioecious. Fl. Jun–Aug, fr. Jul–Sep.

Dry meadows of riverbanks, steppes, limestone slopes of mountains, dry Larix forests and Pinus forests, forest margins; 400–1700 m. Heilongjiang, Nei Mongol [Mongolia, Russia].


Fire绒草 shan ye huo rong cao

Leontopodium alpinum Cassini var. campestrum Lebedeur, Fl. Ross. 2: 614. 1845; L. fedtschenkoanum Beauverd; L. ochroleucum Beauverd subsp. campestrum (Ledebour) Khanminchun; L. ochroleucum var. campestrum (Ledebour) Grubov.

Herbs, perennial. Rhizome simple, shortened, with solitary stem or multicipital, to 10 cm, densely covered with brown relics of leaf sheaths and beset with thinly filiform radicals, usually without stolons, forming small lax fasciculate clusters of a few stems and sterile bundles of leaves. Stems (5–)15–30(–50) cm tall, erect or ascending, herbageous, firm sometimes subflexuous, ash-colored to gray arachnoid tomentose or arachnoid, violet flocculent (as well as on leaves), usually glabrescent, at least in lower half up to anthesis, equally leafy, with 5–20 leaves. Leaves oblong, linear, linear-spatulate, or linear-lanceolate; cauline leaves 2.5–4.5 cm × 2–5 mm, usually corrugated and dropping at anthesis; radical rosette leaves more often narrowly lanceolate, narrowed into a long petiole, ca. 15 cm × 9 mm, both surfaces equally or subequally ash-colored to gray arachnoid tomentose. Synflorescence usually simple, loose, but sometimes corymbiform, to 7 cm in diam., of 3–7 separate groups of capitula. Capitula 7–12(–20), heterogamous or unisexual, dioecious, closely aggregated, 4.6 mm in diam.; bracteal leaves linear or linear-lanceolate, of very unequal lengths, forming irregular multiradiate star of 4.5–5 cm in diam., yellowish or almost white, to pallid yellow (in dried plants), densely tomentose, margin convolute, apex acuminate. Pappus dirty white, 4.5–6.5 mm. Fl. Jun–Sep, fr. Aug–Oct.

Steppes, dry meadows, dry stony and rocky slopes, sandy places, shrubby thickets; 100–3800 m. Gansu, Hebei, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Xinjiang [Japan, Korea, Mongolia, Russia].


绢茸火绒草 juan rong huo rong cao

Herbs, perennial. Rhizome short, stout, with several sterile stems and flowering stems. Stems erect, 10–45 cm tall, densely grayish or white tomentose, densely and equally leafy; internodes 0.5–2 cm. Leaves linear-lanceolate, 20–55 × 4–8 mm, both surfaces densely grayish or white tomentose, base narrowed, apex obtuse or acute. Capitula (1–)3–5, heterogamous, 6–9 mm in diam.; bracteal leaves 3–10, oblong or linear-lanceolate, similar to upper leaves in size, shape, and indumentum, forming an irregular star or compound stars. Involucre 4.6 mm, white lanate; phyllaries 3–4-seriate, apex dark brown, acute, glabrous. Corolla 3–4 mm. Achenes papilllose. Pappus white, ca. 4 mm, serrulate. Fl. Jun–Aug, fr. Aug–Oct.

● Subalpine meadows or dry grasslands; 1600–2900 m. Gansu, Hebei, Qinghai, Nei Mongol, Shaanxi, Shanxi.
tary, sessile, unisexual. Phyllaries few seriate, with brown papery lamina; stereome undivided. Receptacle flat, ealeate. Female florets yellow, filiform, with long apical hairs. Achenes as in disk florets. Disk florets functionally male with long apical hairs. Corolla yellow; corolla lobes erect, veins reaching apex of lobes. Anthers ecalcarate, with short tails; endothecial tissue polarized; apical appendage flat, as wide as thecae. Pollen gnaphalioid. Style bifid; style branches obtuse with obtuse sweeping hairs dorsally, reaching to furcation; stigmatic surface separated. Achenes glabrous, slightly angular, with 5 vascular bundles; epidermis smooth. Pappus dimorphic, barbellate, capillary bristles in 1 row, basally without patent cilia; apical cells clavate in disk florets, acute in female.

- One species: China.


君范菊 jun fan ju

Plants perennial, pulvinate, 4–5 cm tall, densely white or yellowish lanate. Rhizome slender, woody, ascending or erect, with numerous flowering and sterile stems densely congested. Stems 2–3 cm tall, simple or 2- or 3(-5)-branched above. Leaves sessile, alternate and very densely set, ovate-oblong, elliptic-oblong, or oblanceolate, 2–8 × 1–2.5 mm, both surfaces white or grayish lanate with a distinct distal hair tuft adaxially, base narrowed, margin entire, apex obtuse. Capitula usually solitary, dioecious. Involucre 6–8 × 4–5 mm; phyllaries 5- or 6(or 7)-seriate, pallid brown; outer ones ovate or ovate-lanceolate, 3–5 × 1.5–2 mm, apex obtuse; middle ones oblong-lanceolate or oblongate, 7–8 × 2–3 mm, apex acute; inner ones linear-lanceolate or oblongate, 4–5 × ca. 1 mm, apex fimbriate lacerate. Florets 44–55 per capitulum; corolla yellow, ca. 3 mm, densely white villous in upper part; style slightly exerted, lobes ca. 0.3 mm; ovary ca. 0.5 mm, glabrous. Achenes ca. 1 mm, 1-veined, sparsely glandular-papillose. Pappus white, serrulate. Fl. Jul.

- Alpine glacial and gravelly slopes or rocky places; 4500–4900 m. Xizang (Mainling).

This species is characterized by the pulvinate habit, homogeneous florets, and corolla rather densely white villous in the upper part.


蝶须属 die xu shu

Chen Yousheng (陈又生); Randall J. Bayer

Herbs or subshrubs, perennial, dioecious. Leaves alternate, flat, with entire margins, usually tomentose on both surfaces. Capitula solitary, only a few together, or many in corymbs. Phyllaries papery or membranous, colored; stereome undivided. Receptacle flat, foveolate, ealeate. Disk florets functionally male or female; male florets white or purplish, tubular; female florets white or purplish, filiform. Anthers with flat appendages. Style branches truncate, with hairs dorsally and apically. Achenes oblong, with short clavate twin hairs. Pappus bristles capillary, barbellate, conenate into a ring.

About 40 species: temperate and arctic/alpine regions, mainly in Asia, Europe, and North America, a few taxa in South America; one species in China.


蝶须 die xu

Gnaphalium dioicum Linnaeus, Sp. Pl. 2: 850. 1753; Antennaria hyperborea D. Don; A. insularis Greene.

Herbs, perennial, dioecious, 3–10 cm tall. Stolons 2–5 cm. Basal leaves spatulate or rhombic-spatulate, 3–18 × 3–6 mm, abaxially gray tomentose, adaxially green glabrous and distally pink or white, vein 1, apex mucronate; cauline leaves linear, 7–13 mm, not flagged, apex acute. Capitula 3–7 in corymbiform arrays. Involucre 5–6.5 mm in male florets, 5–7 mm in female florets; phyllaries distally dark pink to light pink or white. Corollas 3–4 mm in male florets, 4–5 mm in female florets. Achenes 0.5–1 mm, papillate. Pappus 3.5–4.5 mm in male florets, 5–6 mm in female florets. Fl. May–Aug. 2n = 28.

Dry slopes on tundra, meadows, conifer forests; 600–2700 m. Gansu, Heilongjiang, Xinjiang [Japan, Kazakhstan, Mongolia, Russia; Europe, North America (Alaska)].


垫头鼠麹草属 dian tou shu qu cao shu

Chen Yousheng (陈又生); Randall J. Bayer


One species: N Africa, Asia.

垫头鼠麴草 dian tou shu qu cao


Herbs, annual, prostrate, densely whitish to grayish lanate tomentose. Stems 5–15 cm, many from base, much branched. Leaves sessile, spatulate or obovate-spatulate, 5–15 × 1.5–4 mm, densely white lanate abaxially, hairy adaxially, 1-veined, base narrowly attenuate, apex mucronate; upper leaves densely crowded. Capitula campanulate, 3–4 mm wide, congested in terminal clusters, surrounded by terminal leaves. Phyllaries 2- or 3-seriate, greenish tinged, narrowly elliptic or linear to lanceolate, apex acute, hyaline at tip. Disk florets 4 or 5, bisexual; female florets numerous. Corolla ca. 1 mm, minutely papillose. Pappus setae white, 6 or 7 in female florets and 3 or 4 in bisexual ones, not united into a ring; apical cell subclavate. Fl. Nov–May.

A weed of arid and semiarid areas; ca. 4000 m. SE Xizang [Afghanistan, India, Nepal, Pakistan; Africa (Egypt, Sudan), SW Asia].

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鼠麴草属 shu qu cao shu

Chen Yousheng (陈又生); Randall J. Bayer

Herbs, annual or perennial. Leaves alternate, flat with entire margins, tomentose on both surfaces. Capitula solitary or only a few together. Phyllaries papery, brownish; stereome undivided. Receptacle flat, epaleate. Outer florets purple, filiform. Central florets bisexual, purple. Anthers with flat appendages. Style branches truncate, with hairs apically. Achenes oblong, with short clavate twin hairs. Pappus bristles capillary, scabrid, free.

About 80 species: cosmopolitan; six species in China.

1a. Capitula in racemes or spikes, rarely solitary.

2a. Capitula numerous, in spikes; plants 8–25 cm tall ............................................................... 1. **G. polycaulon**

2b. Capitula in racemes, panicules, spikes, or solitary; plants usually 2–10 cm tall.

3a. Capitula in racemes; outer phyllaries obovate ................................................................. 2. **G. stewartii**

3b. Capitula in spikes, panicles, or solitary; outer phyllaries ovate to ovate-oblong ..................................... 3. **G. supinum**

1b. Capitula in dense globose or glomerulate synflorescences, or compound synflorescences.

4a. Capitula pedunculate, in dense globose or glomerulate synflorescences; leaves white lanate on both surfaces; synflorescences with unequal leaves in irregular arrangement; phyllaries pale yellow, green, or yellowish brown ................................................................. 4. **G. uliginosum**

4b. Capitula sessile, in dense compound synflorescences; leaves adaxially sparsely pubescent, abaxially densely white lanate; compound synflorescences with equal leaves in radiate or stellate arrangement; phyllaries reddish brown.

5a. Basal leaves withering before anthesis ........................................................................... 5. **G. involucratum**

5b. Basal leaves persistent at anthesis, rosette ....................................................................... 6. **G. japonicum**


多茎鼠麴草 duo jing shu qu cao

*Gnaphalium polycaulon* Persoon, Syn. Pl. 2: 421. 1807; *G. strictum* Roxburgh.

Herbs, annual, dwarf, erect to decumbent, densely white lanate-tomentose, especially in upper part. Stems slender, simple or more commonly much branched, 8–25 cm tall, 0.5–1.5 mm in diam. Leaves sessile, grayish green, spatulate or oblanceolate-oblong, 1.5–4.5 cm × 3–8 mm, thinly appressed tomentose on both surfaces, margin and lower midrib sometimes flushed with purple, base narrowed, petioliform, margin wavy, apex obtuse and apiculate. Capitula 2–5, arranged in a spike to 2 cm, at tips of stems and branches, campanulate, 2.5–3 × 2–2.5 mm, densely lanate to 2/3 from base. Phyllaries 3-seriate, loosely imbricate, gradate, with pale brown apex, red-purple middle, and green base, these becoming brown when dry, elliptic-ovate or elliptic to linear-oblong, 1.6–2.2 × 0.5–0.8 mm, scarious, apex acute. Receptacle ca. 1.3 mm in diam., pitted. Outer florets many; corolla greenish yellow, filiform, ca. 1.2 mm, apex minutely 2- or 3-lobed, flushed with purple. Central florets 5 or 6, greenish yellow, tubular, ca. 1.5 × 0.5 mm, 5-toothed at apex, teeth flushed with purple. Stamens yellow, ca. 0.6 mm; anthers sagittate at base, connate into a tube around style. Style white, ca. 1.6 mm; style branches linear, flushed with orange-yellow; ovary olivaceous, cylindric, ca. 0.5 mm. Achenes pale brown, oblong-rectangular, ca. 0.5 mm, minutely punctate. Pappus whitish, ca. 1.2 mm, bristles 5–8, distinct, falling separately. Fl. Jan–Apr. 2n = 14.

A pantropical weed, in moist sunny places at roadsides, in grasslands, and also in and around cultivated fields. Fujian, Guangdong, Guizhou, Hainan, Taiwan, Yunnan, Zhejiang [India, Japan, Pakistan, Thailand; tropical and subtropical Africa, tropical America, Australia].

Similar to *Gamochaeta pensylvanica*, this species differs by its more compact habit, oblanceolate leaves, and free, separately deciduous pappus bristles more dilated at apex.


矮鼠麴草 ai shu qu cao
Gnaphalieae

Omalotheca stewartii (C. B. Clarke ex J. D. Hooker) Holub.

Herbs. Stems erect, 5–10 cm tall, base tufted and lanate, upper part unbranched. Basal leaves tufted and in rosette, persistent at anthesis, sessile, linear, 10–30 × 1–2 mm, densely white tomentose abaxially, less so adaxially; cauline leaves few, linear, ca. 10 × 1 mm, both surfaces white lanate. Capitula few, 2–3 mm in diam., pedunculate, in racemes. Involucre ca. 6 × 5 mm; phyllaries 2–3-seriate, brown or only apex brown; outer ones obovate, 2–3 × ca. 2 mm, abaxially lanate, apex obtuse; inner ones linear-oblong, 5–6 × 1–1.5 mm, abaxially sparsely pubescent or glabrous, apex acute. Female florets: corolla filiform, ca. 1.5 mm. Disk florets ca. 1.5 mm. Achenes obovoid, 3–4 mm, papillate or smooth. Pappus of distinct, capillary bristles, white, falling separately. Fl. Jul–Oct. 2n = 14, 56.

Marshes, riversides, moist grasslands, saline soils, roadsides, Larix forests. N Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Xinjiang, Xizang [Japan, Kazakhstan, Korea, Mongolia, Pakistan, Russia; Europe, North America].

According to Fl. Pakistan (210: 118. 2003), Gnaphalium thomsonii is distributed in China. After comparing the description with G. uliginosum, it seems these two names represent the same species. The Russian botanist Kirpicznikov recognized many names that are closely related to G. uliginosum. Some of them are combined herein.


星芒鼠麴草 xing mang shu qu cao

Gnaphalium involucratum var. ramosum Candolle; G. lineare Hayata (1908), not (Candolle) Schultz Bipontinus (1845); G. morii Hayata; G. sphaericum Willdenow.

Herbs, biennial or perennial, fibrous rooted; stolons usually absent [reportedly present in Australia and New Zealand]. Aerial stems ascending or erect, 30–40 cm tall, slender or rigid, simple to much branched, thinly and persistently white tomentose to densely lanate. Leaves leathery; basal leaves shortly linear, smaller than cauline ones, withering before anthesis; cauline leaves 6 to numerous, sessile, blade linear to linear-oblanceolate or linear-lanceolate, 1–10 × 0.2–0.5 cm (largest at mid-stem), abaxially silvery, tomentose or lanate, adaxially green, glabrate, and shiny, or sparsely lanate, 1-veined, base subclasping (not ampliate) or narrowed, margin entire, revolute, apex acute, mucronulate. Bracts subtending capitula 3–5, 10–15 mm, surpassing capitula, plus some shorter. Capitula in terminal or axillary, dense, hemispheric cymes 1–2 cm in diam. Involucre campanulate, 3–4.5 × 2.5–4 mm; phyllaries 3-seriate, tawny, rosy tinged, or brownish purple, shiny, scariosus, outer ones shorter, oblong or obovate, apex rounded or obtuse, inner ones linear or oblong, apex obtuse or acute. Female florets 80–150. Bisexual florets 3–5(–7). Corolla of outer florets 2.5–3 mm; style of central florets 2.5–3.5 mm. Achenes oblong, compressed, 0.5–0.6 mm, papillose or minutely gland-dotted. Pappus white, 2.5–3.5 mm; bristles distinct or basally coherent, slender. Fl. Feb–Mar, Aug–Dec.

Slopes at middle elevations and on high mountains. Taiwan [Indonesia, Malaysia, Philippines; Australia, Pacific islands (Hawaii, New Zealand)].


細叶鼠麴草 xi ye shu qu cao

Herbs, perennial, from creeping rhizomes; flowering stems tufted, 8–25 cm tall, simple, white lanate. Leaves chiefly radical, few cauline; radical leaves rosulate, linear-oblancoatele, 2.5–10 cm × 4–7 mm, adaxially green, thinly lanate; median cauline leaves linear, 2.25 cm × 2–4 mm; uppermost leaves subtending synflorescence, lanceolate. Capitula to numerous, in a dense headlike corymb. Involucre campanulate, ca. 5 × 4.5 mm; phyllaries reddish brown, imbricate, 3-seriate, obtuse,
outer ones broadly elliptic, inner ones narrowly oblong. Marginal florets female; corolla filiform, ca. 3.5 mm, shorter than style. Disk florets ca. 3.5 mm, apex pinkish. Achenes oblong, ca. 1 mm. Pappus of capillary bristles, white, ca. 3 mm. Fl. May–Oct. 2n = 28.

Grasslands, waste fields; 200–1800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea; Oceania].

182. ANAPHALIS Candolle, Prodr. 6: 271. 1838.

香青属 xiang qing shu
Zhu Shixin (朱世新); Randall J. Bayer

Herbs, perennial, rarely annual or biennial, or subshrubs with somewhat woody rhizome. Stems erect or rosette-forming, simple or branching, densely white or ash-gray cottony tomentose. Leaves simple, alternate, rarely subopposite to opposite, sessile or petiole or decurrent, oblong or lanceolate, entire. Capitula with many florets, 3–15 mm in diam., subglobose campanulate or subfunneliform, arranged in corymbiform or paniculate-corymbiform branched synflorescences, rarely solitary or 2 or 3 per synflorescence. Plants dioecious or heterogamous, having different types of florets: bisexual sterile florets with predominance of female florets arranged in many marginal rows and 1 to few central male florets, or many marginal rows of male florets and a few central female florets. Involucre campanulate, turbinate, or semispherical, base tomentose; phyllaries many seriate, imbricate, erect or expanding, scarious, lower parts brown, 1-veined, upper parts usually scarious, white or yellowish white or rarely pinkish. Receptacle subconvex or flat, alveolate, without squamules. Male florets: corolla tubular, 5-denticulate; stamens basally arrow-shaped with acerose tail; stigma with 2 short lobes, apex truncate. Female florets: corolla filiform, basally slightly dilated, 2–4-denticulate; style branches or flat, alveolate, without squamules. Male florets: corolla filiform, 2–4-denticulate; stamens basally arrow-shaped with acerose tail; stigma with 2 short lobes, apex truncate. Female florets: corolla filiform, basally slightly dilated, 2–4-denticulate; style branches long, apex subrounded. Achenes oblong or subrounded, with glandular hairs or mammilla or almost glabrous, in predominantly female capitula; achenes of male florets vestigial and usually absent in predominantly male capitula. Pappus in both florets consisting of 1 row of free deciduous white hairs, almost equal to corolla, scabrid, pinnate-incrassate at tip of apex in male florets, filiform and almost smooth or slightly scabrid at tip in female florets.

About 110 species: mainly in tropical and subtropical Asia, but a few species also in temperate Asia, Europe, and North America; 54 species (40 endemic) in China; one additional species (endemic, not included in the key) is of uncertain position.

1a. Involucre 8–12(−15) mm, spherical or broadly campanulate; capitula usually few, arranged in sparse to compound corymbiform synflorescences, or sometimes solitary.
2a. Leaves not decurrent on stems; involucre spherical, capitula usually lax.
3a. Rhizome thickish; cauleine middle leaves linear-lanceolate, cinereous or yellowish lanate; capitula congested, densely corymbiform ................................................................. 54. A. acutifolia
3b. Rhizome slender, sermentose; cauleine leaves oblong, oblanceolate, or spatulate; capitula usually lax corymbiform or solitary.
4a. Phyllaries white or yellowish white, base reddish brown; both surfaces of leaves gray lanate; Taiwan .......... 53. A. nagasawae
4b. Phyllaries white, base dark brown; leaves adaxially arachnoid, abaxially densely gray lanate.
5a. Stems slender, lower parts 1–2 mm in diam.; leaf base not obviously amplexicaul, 3-veined, occasionally 1-veined; capitula few (or many) or solitary .............................................. 51. A. nepalensis
5b. Stems thickish, lower parts up to 4 mm in diam.; leaves broad and large, base amplexicaul, 3- or 5-veined ............................................................................................................................................... 52. A. triplinervis
2b. Leaves somewhat decurrent and winglike on stems; capitula densely congested forming globose corymb, or solitary.
6a. Perennial herbs, rhizome slender; involucre broadly campanulate or semispherical, 8–11 mm.
7a. Phyllaries yellowish white, yellow, or sulfureous, rarely reddish; leaves gray or yellowish white arachnoid tomentose on both surfaces ................................................................. 49. A. flavescens
7b. Phyllaries white; leaves somewhat green, both surfaces with capitulate glandular hairs and canescent arachnoid tomentum on margin ......................................................................................... 50. A. hancockii
6b. Small or pulvinate subshrubs; involucre spherical.
8a. Stems and both surfaces of leaves grayish, tangle-cottony, felt-papery tomentose ......................... 45. A. chlamydophylla
8b. Stems and both surfaces of leaves usually without above indumentum.
9a. Stems and both surfaces of leaves yellowish brown long lanate; phyllaries wax-yellow or dark yellow; stems 6–20 cm ........................................................................................................ 46. A. pannosa
9b. Stems and both surfaces of leaves yellowish or grayish white lanate; stems 3–8 cm or acaulescent.
10a. Both surfaces of leaves yellowish green, grayish white, or yellowish white tomentose; phyllaries white or yellowish white, base brown ................................................................. 48. A. viridis
10b. Both surfaces of leaves cinereous or grayish white lanate; phyllaries white, base dark brown ........ 47. A. cinerascens
1b. Involucre 4–8 mm, obovate, campanulate, or semispherical; phyllaries obtuse or rounded at apex, rarely acuminate, usually expanding after flowering; capitula usually numerous, rarely few, congested to compound corymbiform or corymbiform at apex of stems or branches.
11a. Leaves not or scarcely decurrent on stems.

12a. Leaf base cordate or auriculate, semiamplexicaul, margin recurved, thin or submembranous.

13a. Plants tall, stems thickish, lower parts 2–4 mm in diam.; leaves large, 1.5–6 cm, arachnoid or glabrous adaxially .................................................................................................................. 8. *A. contorta*

13b. Plants short, stems slender, lower parts ca. 1 mm in diam.; leaves 0.5–1.5 cm, lanate on both surfaces .......... 9. *A. hondae*

12b. Leaf base attenuate, not obviously amplexicaul, margin flat or recurved, thick.

14a. Multibranched subshrubs, usually fastigate; leaves narrowly linear, margin recurved, densely white tomentose on both surfaces ......................................................................................................... 10. *A. virgata*

14b. Perennial herbs, or stem base woody, or subshrubs, unbranched or branched but not fastigate; leaves not linear, margin flat or recurved.

15a. Leaves gradually larger upward from middle, densely arranged to radiate under synflorescences, usually longer than compound corymb or corymb.

16a. Upper leaves elliptic, apex acuminate; phyllaries white ........................................................................ 32. *A. oxyphylla*

16b. Upper leaves oblong-lanceolate, apex acute; phyllaries purple-red or margin white ......................... 33. *A. porphyrolepis*

15b. Leaves gradually smaller upward from middle, not dense under synflorescences, upper ones shorter than compound corymb or corymb.

17a. Stems gray tangled papery tomentose; leaves white cottony tomentose .................................................. 7. *A. contortiformis*

17b. Stems gray tomentose; leaves arachnoid or later glabrous adaxially, densely gray to rufous tomentose abaxially, or both surfaces white tomentose.

18a. Leaves densely white tomentose, 0.8–1 cm, margin recurved; middle phyllaries with longitudinal corrugation, apex rounded .............................................................................................................. 6. *A. plicata*

18b. Leaves arachnoid or later glabrous adaxially, densely gray to rufous tomentose abaxially, 1.5–10 cm; middle phyllaries without longitudinal corrugation.

19a. Leaves linear or linear-lanceolate, 5–10 cm, margin flat, base not decurrent on stems; phyllaries milky white, apex obtuse or rounded, rarely acuminate ......................................................... 3. *A. margaritacea*

19b. Leaves usually linear or linear-oblong, 1.5–3.5 cm, base slightly decurrent on stems; phyllaries snow white or yellowish white.

20a. Involucre 5–7 mm, phyllaries snow white; Xizang .............................................................................. 4. *A. royleana*

20b. Involucre ca. 5 mm, phyllaries yellowish white; Taiwan ................................................................. 5. *A. morrisonicola*

11b. Leaves decurrent to broadly or narrowly winged on stems.

21a. Stems, leaves, and involucre base with rust-colored stalked adhesive hairs; involucre obovate, phyllaries beige, membranous, translucent, not expanding ...................................................................... 1. *A. bulleyana*

21b. Stems, leaves, and involucre base gray, white, or yellowish brown lanate, with squarrose or capitate-stalked glandular hairs, or arachnoid, or somewhat glabrous; involucre campanulate or semispherical, phyllaries white or reddish, usually scarious, opaque, rarely membranous, somewhat expanding.

22a. Biennial herbs with thickish taproot ........................................................................................................ 2. *A. busua*

22b. Perennial herbs with rhizome, or multibranched subshrubs or small subshrubs.

23a. Both surfaces of leaves arachnoid at first, later glabrous except midvein and margin, without glandular hairs, dark green when dry; perennial herbs .................................................................................. 11. *A. delavayi*

23b. Both surfaces of leaves or only abaxially tomentose, or both surfaces or adaxially with squarrose or capitate-stalked glandular hairs, or adaxially glabrous and green when dry; subshrubs or perennial herbs.

24a. Subshrubs or small subshrubs, stems multibranched.

25a. Involucre 6–8 mm, broadly campanulate; both surfaces of leaves arachnoid tomentose or adaxially glabrous.

26a. Phyllaries dark yellow or adaxially wax-yellow; leaves spatulate or oblong-spatulate, margin flat, both surfaces tomentose ........................................................................................................ 34. *A. yunnanensis*

26b. Phyllaries white or pale reddish white; leaves obovate or ovate-oblong, adaxially arachnoid tomentose or glabrous, abaxially tomentose .................................................................................. 35. *A. muliensis*

25b. Involucre 4–5 mm, narrowly campanulate or campanulate, very rarely up to 6 mm in male plants; leaves tomentose or adaxially or squarrose tomentose.

27a. Leaves spatulate-ovate; phyllaries white or pale red ........................................................................... 36. *A. suffruticosa*

27b. Leaves narrower, not spatulate-ovate; phyllaries white.

28a. Leaves narrowly oblong or linear-oblong, both surfaces arachnoid tomentose or abaxially densely white or yellowish white tomentose ............................................................................. 37. *A. stenocephala*

28b. Leaves linear or linear-lanceolate, adaxially arachnoid or capitulate glandular or squarrose tomentose, abaxially densely gray tomentose ........................................................................ 38. *A. gracilis*

24b. Perennial herbs with rhizome, sometimes with taproot, stems unbranched or lower part woody and with developing axillary buds or short branches.

29a. Phyllary claw with glandular dots at apex; both surfaces of leaves gray or yellowish white tomentose, or only with capitate-stalked glandular hairs ......................................................................... 12. *A. latialata*
29b. Phyllary claw without glandular dots at apex.
30a. Stem slender, 1–2 mm in diam., densely many clustered; leaves narrowly linear, margin undulate recurved ................................................. 29. *A. tibetica*
30b. Stems slender or thickish, not densely many clustered; leaf margin flat or slightly reflexed or recurved and blade not narrowly linear.
31a. Leaves adaxially at first arachnoid, later glabrous, without glandular hairs, or with appressed thick hairs, abaxially usually white tomentose.
32a. Involucre 4–5 mm, campanulate; leaves 3-veined ................................................................. 27. *A. corymbifera*
32b. Involucre 6–8 mm, broadly or narrowly campanulate; leaves 1- or 3-veined.
33a. Middle leaves oblong-lanceolate, 2–3 × 0.4–1 cm, margin usually reflexed or slightly recurved, obviously 3-veined ............................................................. 15. *A. likiangensis*
33b. Leaves oblanceolate or narrowly winged, 0.4–1.3 × 0.2–0.25 cm, margin flat, 1-veined ................................................................. 16. *A. tenuissima*
31b. Leaves adaxially with lanate or squarrose or capitate-stalked glandular hairs, not glabrous.
34a. Phyllaries scarious at upper parts or apex, white, opaque, middle and lower parts membranous, somewhat transparent, apex obtuse or slightly acuminate.
35a. Leaves oblanceolate or linear-oblong, 2.5–4.5 × 0.5–2 cm; involucre 6–7 mm ............... 14. *A. hymenolepis*
35b. Leaves linear-spatulate, 2.5–5 × 0.2–0.5 cm; involucre 4–5 mm ......................................... 26. *A. flaccida*
34b. Phyllaries all scarious, opaque.
36a. Stems 50–100 cm, lower parts woody, persistent, usually with developing axillary buds or branches ................................................................. 30. *A. surculosa*
36b. Stems 3–50 cm, herbaceous, unbranched, rarely lower parts slightly woody, with developing axillary buds or branches.
37a. Both surfaces of leaves tangled to cottony-papery tomentose; phyllaries wax-yellow when dry ................................................................. 28. *A. pachylaena*
37b. Both surfaces of leaves or abaxially white, gray, or yellowish white tomentose or arachnoid, or adaxially with squarrose or capitate-stalked glandular hairs.
38a. Plants with thickish woody roots or rhizome; stems unbranched.
39a. Both surfaces of leaves white, gray, or cinereous tomentose, without obvious capitate glandular hairs.
40a. Involucre ca. 5 mm, phyllaries white, apex obtuse or subrounded ............... 43. *A. szechuanensis*
40b. Involucre 6–8 mm, rarely only ca. 5 mm, phyllaries white, reddish, or red-purple.
41a. Phyllaries purple-red or white, usually yellowish white when dry, inner ones with apex acute; leaves cinereous tomentose; flowering and sterile stems congested to pulvinate ......................................................... 42. *A. rhododactyla*
41b. Phyllaries milky white or somewhat red, apex obtuse or rounded; leaves densely white or gray tomentose; flowering stems and rosette leaves usually caespitose.
42a. Involucre (5–)6(–7) × 5–7 mm; capitula numerous, densely compound corymbiform ................................................................. 39. *A. lactea*
42b. Involucre ca. 7 × 8 mm; capitula 4–8, densely corymbiform or headlike .... 40. *A. batangensis*
39b. Both surfaces of leaves with obvious capitate glandular hairs or arachnoid, or margin and abaxially of rosette leaves tomentose.
43a. Leaves (dried) thin, yellowish green, cauline leaves with glandular hairs, only arachnoid along veins; phyllaries yellowish white, apex obtuse or rounded ................ 18. *A. virens*
43b. Leaves thick, both surfaces with arachnoid and glandular hairs; phyllaries white or sometimes pale red.
44a. Stems 3–7 cm, rarely taller; flowering stems and rosette leaves somewhat congested to pulvinate ......................................................... 44. *A. xylorhiza*
44b. Stems 15–50 cm, rarely shorter; flowering stems and rosette leaves somewhat clustered.
45a. Lower stems woody, persistent; middle leaves elliptic or oblong-lanceolate, margin and midvein abaxially arachnoid tomentose; involucre 6–7 mm, phyllaries ivory white or somewhat reddish ......................................................... 19. *A. elegans*
45b. Stems herbaceous; middle leaves oblongate-oblong or linear, both surfaces arachnoid tomentose; involucre 5–7 mm, phyllaries white ........................................ 41. *A. souliei*
38b. Plants with long slender rhizome.
46a. Lower stem slightly woody, with tomentose axillary buds or short branches; leaves adaxially arachnoid, later glabrous, abaxially thinly arachnoid tomentose and glandular, upper leaves usually tomentose on both surfaces ................................................ 47. A. desertii

46b. Stems unbranched, or sometimes branched from broken stems; leaves adaxially tomentose, or with squarrose or glandular hairs.

47a. Involucre 6–8 mm; both surfaces of leaves gray, yellowish white, or rarely yellowish brown tomentose or lanate.

47b. Involucre 4–5 mm or to 6 mm; both surfaces of leaves or abaxially white or gray tomentose.

50a. Both surfaces of leaves dark cinereous, densely tomentose and with capitulate glandular hairs.

50b. Leaves adaxially with squarrose or capitulate glandular hairs, abaxially or both surfaces white or gray tomentose.

52a. Involucre semispherical; stems 10–18 cm; Taiwan ............................................. 24. A. transnokoensis

52b. Involucre campanulate or subobconic; stems 20–60 cm.

53a. Involucre 4–5 mm, phyllaries white or sometimes pale red; stems densely leafy, internode 0.5–2 cm; leaves 1- or 3-veined ............................................. 21. A. sinica

53b. Involucre 5–6 mm or more, phyllaries white or yellowish white; upper stems sparsely leafy, internode 4–10 cm; leaves 3- or 5-veined ............ 25. A. aureopunctata


粘毛香青

Pluchea bulleyana Jeffrey, Notes Roy. Bot. Gard. Edin- 

burgh 5: 183. 1912; Conyza mollis H. Léveillé (1912), not Will- 

denow (1803).

Herbs, annual or biennial, with thickish taproot, rosette leaves, and solitary or a few caespitose flowering stems, all arachnoid long cottony tomentose and with rusty brown adhesive stalked glandular hairs. Stems erect, 30–80 cm, channelled, usually branched, lower parts usually glabrous, upper parts densely hairy. Rosette leaves obovate, ca. 9 × 5.5 cm, long cottony tomentose, base attenuate and becoming a short winged petiole; lower leaves often caducous and withered by anthesis; middle and upper leaves oblanceolate or obovate-spatulate, 3.5–10 × 1–2.5 cm, both surfaces pilose glandular, long cottony tomentose along veins, 3-veined and with lateral veins, base decurrent on stems and becoming a cuneate broad wing, margin flat, apex acute; uppermost leaves smaller, linear-lanceolate. Capitulum numerous, congested in compound corymbiform syn- florescences terminal on stems and branches; peduncle ca. 6 mm. Involucre obovate, 5–6 × 4–7 mm; phyllaries 4- or 5-seri- ate, erect, light brown, hyaline, base light lutescent, not expanding; outer phyllaries short, ovate-oblong, apex obtuse, arachnoid hairy; middle ones narrowly spatulate, 5–6 mm; innermost ones broadly linear, with a claw ca. 2/3 of full length. Receptacle alveolate. Capitulum with many florets, with 4 or 5 or 30 central male florets and many or few rows of marginal female florets. Corolla 3–5 mm. Pappus slightly exserted from corolla; male florets pappus somewhat incrassate at tip of apex, serrulate. Achene oblong, 0.6–0.7 mm, glandular. Fl. Aug–Sep, fr. Sep–Oct.

● Subalpine wet slopes, low hill grasslands; 1100–3300 m. Gui- zhou, W Sichuan, N and NW Yunnan.

The species is unique in the genus for its color and structure of phyllaries.


蛛毛香青

Gnaphalium busua Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 173. 1825; Anaphalis araneosa Candolle; A. semi- 
decurrents (Wallich ex Candolle) Candolle; G. semidecurrens Wallich ex Candolle.

Herbs, biennial, with thickish taproots or usually adventitious roots at base of stems. Stems erect, (2–)5–6(–13) cm, with ascending or expanding branches, lower parts glabrous or later brownish glandular hairy, upper parts arachnoid tomentose; internode 0.5–2.5 cm. Lower cauline leaves often cadu- 
cous and lost by anthesis; middle leaves linear or linear-lanceolate, 3–10 × 0.4–1 cm, base almost equilateral, decurrent on stems forming a cuneate attenuate long wing, margin flat or somewhat undulate, apex apiculate; upper leaves smaller, linear or subulate; all leaves thin, gray-green with yellow spot and squarrose hairy abaxially, green and squarrose hairy adaxially,
arachnoid tomentose along veins on both surfaces and/or margin arachnoid cottony tomentose abaxially, midvein exerted abaxially, lateral veins somewhat conspicuous. Capitula numerous, compound corymbiform, terminal on branches; peduncle ca. 4 mm. Involucre broadly campanulate, 4.5–5.5–7 mm; phyllaries 4–5-seriate, white, somewhat brownish abaxially; outer phyllaries elliptic, ca. 4 mm; middle ones oval, ca. 4.5 × 1.8–2 mm, 1.3–1.5 mm in female florets, apex arcuate; innermost ones spatulate, ca. 3.5 mm, with a claw ca. 1/3 of full length. Receptacle alveolate. Predominantly female capitula with many florets, with 4–10 or more central male florets and many rows of marginal female florets; predominantly male capitula with many florets, with few rows of marginal female florets and many rows of central male florets. Corolla ca. 2.5 mm, almost as long as pappus; male florets pappus incrassate at tip of apex, serrulate. Achene elliptic, only 0.4–0.8 mm, glanular. Fl. Sep–Oct, fr. Oct. 2n = 42.

Low hill valleys, slopes, woodlands, grasslands; 1500–2800 m. SW Sichuan (Dechang, Miyi), S Xizang (Zhufeng), NW and W Yunnan (grasslands or shrublands, rocky valleys and roadsides, slopes, banks; 300–3400 m. E, S, and W Gansu, Guangdong, Guizhang, Guangxi, Guizhou, Hebei, Henan, E and W Hubei, Hunan, Jiangxi, Qinghai, S Shanxi, Sichuan, Taiwan, Xizang, Yunnan) [Japan, Korea].


珠光香青 zhu guang xiang qing

Herbs, perennial. Rhizome repent, woody, with short brown squamate runners. Stems solitary or a few caespitose, erect or ascending, 30–60(–100) cm, usually thickish, unbranched, rarely branching on broken or normal stems, ash-gray cottony tomentose, base woody. Lower leaves withered by anthesis, apex obtuse; middle leaves expanding, linear or linear-lanceolate, 5–10 cm × 3–12 mm, rarely wider, base attenuate or sharply narrowed, somewhat amplexicaul, margin flat, apex acuminated with small tip; upper leaves gradually smaller with long tip; all leaves slightly leathery, abaxially densely ash-gray to reddish brown lanuginous, adaxially arachnoid or later glabrous, 1-veined, or 3- or 5-veined. Capitula numerous, arranged in compound corymbiform (or corymbiform) synflorescences; peduncle 4–17 mm. Involucrc broadly campanulate or semi-spherical, 5.8–8–13 mm; phyllaries 5–7-seriate, somewhat expanding, upper parts white; outer phyllaries up to 1/3 of involucrc, ovate, cottony tomentose; middle ones ovate to oblong, ca. 5 × 2.5 mm, up to 3 mm wide in male plants, apex rounded or acuminated; innermost ones linear-lanceolate, ca. 0.5 mm wide, with a claw up to 3/4 of full length. Receptacle alveolate. Predominantly female capitula with many florets, with 3–20 central male florets and many rows of marginal female florets. Predominantly male capitula with many florets, with all central male florets or few rows of marginal female florets. Corolla 3–5 mm. Pappus slightly exerted from corolla, filiform in female florets, incrassate at tip of apex, serrulate in male florets. Achene oblong, ca. 0.7 mm, with glandular dots. Fl. and fr. Jul–Nov. 2n = 28*, 42, 56*.

Conifer and Betula forests, dry soils, subalpine or low mountain grasslands or shrublands, rocky valleys and roadsides, slopes, banks; 300–3400 m. E, S, and W Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, E and W Hubei, Hunan, Jiangxi, Qinghai, S Shanxi, Sichuan, Taiwan, Xizang, Yunnan [Bhutan, India, Japan, Korea, Myanmar, Nepal, Russia (Far East), N Thailand, Vietnam; North America; widely introduced in Europe].

1a. Leaves 3- or 5-veined or with 2 veinlets between veins, oblong or linear-lanceolate, 7–12 mm wide ................................................... 3c. var. cinnamomea

1b. Leaves 1-veined or with 2 veinlets on margin, linear or linear-lanceolate, 3–8 mm wide

2a. Leaves linear-lanceolate, 3–8 mm wide ............................................. 3a. var. margaritacea

2b. Leaves linear, 3–6 mm wide ...... 3b. var. angustifolia

3a. Anaphalis margaritacea var. margaritacea

珠光香青(原变种) zhu guang xiang qing (yuan bian zhong)


Stems 30–60 cm, sometimes to 100 cm. Leaves linear-lanceolate, 5–9 cm × 3–8 mm, abaxially densely gray or light brown lanuginous, adaxially arachnoid or later glabrous, midvein raised, always with 2 veinlets on margin, base attenuate. Involucrc 6–8 × 8–13 mm. 2n = 28*, 56*.

Subalpine or low mountain grasslands, rocky valleys and road-sides; 300–3400 m. S Gansu, N Guangxi, W Hubei, S Hunan, E Qinghai, S Shanxi (Qin Ling), Sichuan, Xizang, Yunnan [India, Japan, Nepal, Russia (Far East); North America; widely introduced in Europe].

This taxon is extremely variable.


线叶珠光香青 xian ye zhu guang xiang qing


Stems 30–60 cm. Leaves linear, 3–10 cm × 3–6 mm, acuminate; lower leaves oblong or rounded, abaxially densely light brown or yellowish brown lanuginous, adaxially arachnoid or glabrous. Involucrc sometimes small, ca. 5 mm. Corolla ca. 3 mm.

Subalpine or low mountain grasslands, rocky valleys and roadsides; 300–3400 m. S and W Gansu, Guizhou, Henan, E Hubei, Qinghai, S Shanxi, Sichuan, Xizang (Bomi, Zayü), Yunnan [Japan, Korea].

This taxon is extremely variable in length, width of leaves, and length of internode.

*Antennaria cinnamomea* Candolle, Prodr. 6: 270. 1838; *Anaphalis cinnamomea* (Candolle) C. B. Clarke.

Stems 50–100 cm. Leaves oblong or linear-lanceolate, 4–9 cm × 7–12 cm, sometimes to 25 mm, abaxially densely yellowish brown or reddish brown lanuginous, adaxially gray arachnoid lanuginous, raised 3- or 5-veined, base weakly auriculate, apex acuminate. Involucre same as var. *angustifolia*. $2n = 42$.

Low mountain or subalpine shrublands, grasslands, slopes, banks; 500–2800 m. E and S Gansu (Tianshui, Yuzhong), Guangdong, Guangxi, Guizhou, W Hunan, Jiangxi, S Shanxi, Sichuan, Xizang, Yunnan [Bhutan, India, Myanmar, Nepal].


须弥香青 须弥香青

*Anaphalis polylepis* Candolle.

Herbs or subshrubs, base ± woody, branched. Branches erect or unbranched, white cottonose. Leaves dense, sessile, somewhat adnate to stem, linear-oblong or oblong-lanceolate, 2–3 cm, 1-veined, abaxially white arachnoid tomentose or gray or reddish brown lanuginous, adaxially glabrous, base weakly decurrent, margin entire, apex obtuse or acute, with short cusp. Capitula 7–9, densely arranged in corymbiform synflorescences; peduncle ash-gray cottony tomentose, as long as synflorescence. Involucre 5–7 mm; phyllaries snow white, glabrous, apex obtuse or acuminate; outer phyllaries ovate, shorter; middle ones ovate-oblong, longer than florets; innermost ones linear-oblong, as long as disk. $2n = 28^*$.

Xizang [Bhutan, India, Kashmir, Nepal].


玉山香青 玉山香青


Rhizome repent, somewhat woody, usually sarmentose. Stems usually caespitose, erect or ascending, 15–40 cm, slender, much branched or unbranched, densely gray cottony tomentose; internodes short. Lower leaves persistent or caducous and lost by anthesis, smaller, apex obtuse; middle leaves expanding, linear, oblong, or oblanceolate-linear, 1.5–3.5 × 0.2–0.4(–0.7) cm, base attenuate, semiamplexicaul and somewhat decurrent, margin flat, apex acute or obtuse, with small cusp; upper leaves stenophyllous; all leaves slightly leathery, abaxially densely gray or fulvous cottony tomentose, adaxially glabrous or arachnoid tomentose, 1- or 3-veined. Capitula 5 or more, arranged in corymbiform synflorescence terminal on stems; peduncle 2–6 mm. Involucre broadly campanulate or semispherical, ca. 5 × 5–6 mm; phyllaries 7- or 8-seriate; outer phyllaries ovate, 1–2 mm, cottony tomentose; middle ones yellowish white, elliptic, ca. 4.3 × 1.5 mm; innermost ones narrower, spatulate, with a claw ca. 2/3 of full length. Receptacle alveolate. Predominantly female capitula with outer florets female, with 3 or 4 male florets present in center; predominantly male capitula with male florets only. Corolla ca. 3 mm. Pappus as long as corolla; male florets pappus somewhat incrassate at tip of apex, serratulate. Achene oblong, 0.5–0.7 mm, with lax glandular spots. Fl. and fr. Jul–Oct. $2n = 28^*$.

Low hills, subalpine grasslands, rocks; 1600–3500 m. Taiwan [Philippines].


褶苞香青 褶苞香青

Herbs, perennial. Stems ca. 10 cm, woody, 1–2 mm in diam., branched; branches ascending or arcuate-ascending, densely cottony tomentose, densely leathery, bi-corymbiform branched at apex of flowering stems, compound corymbiform, 1.5–2 mm in diam. Rosette leaves at apex of sterile branches, linear-lanceolate, 8–10 mm; lower leaves small, 4–5 mm wide, both surfaces densely white cottony tomentose, margin flat, apex obtuse; middle leaves sessile, expanding, linear-lanceolate, 8–10 × 1.5–2 mm, both surfaces densely white cottony tomentose, base somewhat decurrent, margin recurved, apex obtuse, with small cusp; leaves 5–8 mm in synflorescence. Capitula 20–30, arranged in compound corymbiform synflorescences, globose, ca. 5 × 6 mm when dry; peduncle 0–2 mm. Involucre base densely cottony tomentose; phyllaries 4–5-seriate; outer phyllaries opaque, somewhat brownish abaxially, ovate or oblong, 2–2.5 mm, apex obtuse; middle leaves expanding, middle to apex white, lower parts hyaline, oblanceolate-oblong, sometimes lanceolate, 4–4.5 mm, margin flat, apex rounded, with longitudinal corrugation. Receptacle alveolate. All florets male, sterile; corolla tubular, ca. 2.5 mm. Pappus white, ca. 3.2 mm, with hairs of apex slender and scabrid and easily deciduous. Fl. Sep. $2n = 56^*$.

● E and S Xizang (Lhasa, Markam).

No specimens of this species were seen by the second author.


银衣香青 银衣香青

Subshrubs. Rhizome thickish. Sobols densely white cottony tomentose, usually with large leaves, caespitose with flowering stems. Stems erect, 30–60 cm, slightly slender, ash-gray silky tangled papery tomentose, virgate, base woody, usually densely leafy. Leaves expanding, 2–6 cm × 2–5 mm; lower leaves usually caducous and lost by anthesis; middle leaves linear or oblanceolate, broad or somewhat narrow at base, base decurrent on stems and becoming a short and narrow wing, apex acute or acuminate, with short cusp; upper leaves narrow and small, linear or subulate; all leaves white cottony tomentose, margin flat or somewhat recurved, midvein somewhat ex-

Slopes, grasslands; 1500–2800 m. Xizang, Yunnan.

8. Anaphalis contorta (D. Don) Buchanan-Hamilton; Diels; A. tenella (Franchet) Y. Ling; G pellucidum (Franchet) Thunberg ex Thomson in C. B. Clarke, Compos. Ind. 107. 1876.


多茎香青 duo jing xiang qing

Rhizome repent, woody, with dense slender roots. Flowering stems and sterile stems numerous and caespitose. Stems erect or ascending, 5–10 cm, slender, woody at base, white or ash-gray cottony tomentose, lower parts later glabrous, usually unbranched, developed axillary buds at lower parts, all plants densely leafy. Leaves expanding, lower leaves usually caducous and lost by anthesis, linear, 5–10 × ca. 1 mm, base equalateral, serrulate. Capitula numerous, arranged in corymbiform or compound-corymbiform synflorescences, terminal on stems and branches; peduncle 1–3 mm. Involucre broadly campanulate, 4–5 × 5–6 mm, lanceolate-linear, 10–15 mm, base slightly amplexicampanulate, or glandular at apex. Predominantly female capitula with male florets only. Corolla 3–3.5 mm. Pappus slightly shorter than corolla, slightly inerupted at tip of apex, serrulate. Female florets unknown. Fl. Jul–Oct.

Slopes, grasslands; 1700–3500 m. Xinjiang, W Xizang [Kashmir, Nepal, Pakistan; C Asia, SW Asia (Iran)].
Authors. The above description was based on specimens from Kashmir.


**Gnaphalium delavayi** Franchet, J. Bot. (Morot) 10: 409. 1896.

Herbs, perennial. Rhizome thickish, somewhat woody, with withered leaves and sobols or runners bearing squamiform leaves. Stems erect, 5–35 cm, somewhat thickish, lower parts glabrous, upper parts ash-gray arachnoid, all plants with sparse leaves. Rosette leaves obovate-spatulate, 1.5–3.5 × 1–1.5 cm; lower leaves usually caducous and lost by anthesis; middle leaves erect or somewhat expanding, obovate-oblong or oblong, 4–6 × 1–2 cm, base decurrent and becoming cuneate or a narrow wing, margin flat, apex obtuse or rounded, with small cusp; upper leaves narrow and small, apex acute; all leaves densely arachnoid abaxially, sparsely arachnoid hairy adaxially, later glabrous except for midvein and margin, midvein somewhat exserted abaxially, with 3 conspicuous veins or another pair of lateral veins. Capitula numerous, corymbiform, dense, terminal on stems; peduncle 2–5 mm. Involucre campanulate, ca. 7 × 5 mm; phyllaries 5-seriate; outer phyllaries red-brown or puce, ovate, ca. 4.5 mm, arachnoid tomentose, apex acute; middle ones puce abaxially, white or yellow-white adaxially, ovate-lanceolate, ca. 7 × 2 mm, apex acute; innermost ones oblong-linear, with a claw ca. 2/3 of full length. Receptacle fimbriolate. Center of capitulum with female florets and a few bisexual sterile florets; predominantly male capitula with male florets only. Corolla 3.5–4 mm. Pappus ca. 4.5 mm; male florets pappus somewhat inerassate at tip of apex, dentate. Achene oblong, ca. 1.2 mm, glabrous. Fl. May–Aug, fr. Aug–Sep.

- Alpine grasslands, forest margins; 3000–4000 m. NW Yunnan.


**Anaphalis latialata** Maximowicz var. **viridis** Handel-Mazzetti; **A. latialata** var. **viridis** (Handel-Mazzetti) Y. Ling & Y. L. Chen.

Rhizome usually woody, with short reddish brown lepidoid runners of squamiform leaves, with somewhat caespitose sterile stems and flowering stems. Stems erect, 30–50 cm, slightly slender, white arachnoid hairy and with tentacles, unbranched or with synflorescence branches at upper parts, rather densely leafy at lower parts. Lower leaves usually short and small, often caducous and lost by anthesis; middle leaves expanding, linear-lanceolate or linear-oblong, 3–5 × 0.2–0.8 cm, base equalateral, decurrent on stems and becoming a narrow or cuneiform wing, margin flat, apex acuminate, with short cusp; upper leaves small, somewhat erect, apiculate, with withered scarious long cusp; all leaves arachnoid cottony tomentose, densely lanate, or only with capitate-stalked glandular hairs, midvein exserted abaxially, lateral veins not conspicuous. Capitula numerous, compound corymbiform, dense, terminal on stems and branches; peduncle 1–3 mm; common peduncle of synflorescence ca. 2 cm. Involucre campanulate, 6–7 × 6–8 mm; phyllaries 6- or 7-seriate; outer phyllaries ovate, ca. 2.5 mm, sparsely cottony tomentose; middle ones white or liruid, oblong, ca. 6 × 2.5 mm, apex somewhat obtuse, with gland at top of claw; innermost ones oblong-linear, with a claw ca. 2/5 of full length. Receptacle with fimbriolate short hairs. Outer rows of predominantly female capitula female, with 1 or 2 male florets present in center; predominantly male capitula with male florets only. Corolla 3.2–3.5 mm. Pappus almost equaling corolla, male florets pappus incrassate at tip of apex, serrulate. Achene ca. 1 mm, with sparse glandular spots. Fl. and fr. Jul–Oct.

- Alpine and subalpine slopes or mountainous regions exposed to sun. W Gansu, E Qinghai, W Sichuan, Yunnan.


**Anaphalis bicolor** (Franchet) Maximowicz, J. Bot. (Morot) 10: 409. 1896.

1a. Upper parts of plants yellow or whitish; yellow cottony tomentose, lower parts ash-gray cottony tomentose, capitae glandular hairs with long stalk under lanate hairs.
2a. Leaves dense, internodes usually 2–5 mm; upper leaves somewhat erect or adnate to stems, leaves 1.5–4 cm × 2–4 mm, linear or oblong-linear, apex acuminate; involucre 6–6.5 mm ...................... 13a. var. bicolor

2b. Leaves sparse, internodes usually 5–10 mm; upper leaves somewhat expanding, 6–7 cm × 4–8 mm, oblong-linear, apex obtuse; involucre 7–8 mm ................. 13b. var. longifolia

1b. All plants gray or white lanate, or stems and leaves adaxially arachnoid hairy or glandular hairy.

3a. Leaves adaxially arachnoid hairy and with capitate glandular hairs with long stalk, margin usually undulate, expanding ....................... 13e. var. undulata

3b. All plants gray or white lanate, leaf margin not undulate.

4a. Leaves dense, internodes 2–5 mm; upper leaves erect or weakly expanding, 1.5–4 cm × 2–4 mm, apex acuminate; involucre ca. 6 mm .......... 13c. var. subconcolor

4b. Leaves sparse, internodes 4–10 mm; upper leaves expanding, 2.5–5 cm × 3–7 mm, apex rounded or obtuse; involucre ca. 7 mm ............... 13d. var. kokonorica

13a. Anaphalis bicolor var. bicolor

二色香青(原变种) er se xiang qing (yuan bian zhong)


Upper parts of plants yellow or whitish yellow cottony tomentose, lower parts ash-gray cottony tomentose, capitulate glandular hairs with long stalk under lanate hairs. Leaves dense; internodes usually 2–5 mm. Upper leaves somewhat erect or adnate to stems; leaves linear or oblong-linear, 1.5–4 cm × 2–4 mm, apex acuminate. Involute ca. 6–6.5 mm.

- 2000–3500 m. SW and W Sichuan, N and W Yunnan.


长叶二色香青 chang ye er se xiang qing

Upper parts of plants yellow or whitish yellow cottony tomentose, lower parts ash-gray cottony tomentose, capitulate glandular hairs with long stalk under lanate hairs. Leaves sparse; internodes usually 5–10 mm. Upper leaves somewhat expanding, oblong-linear, 6–7 cm × 4–8 mm, apex obtuse. Involute 7–8 mm.

- 3400–3800 m. SW and W Sichuan, NW Yunnan (Lijiang).


同色二色香青 tong se er se xiang qing

All plants gray or white lanate. Leaves dense; internodes 2–5 mm. Upper leaves erect or weakly expanding, 1.5–4 cm × 2–4 mm, apex acuminate. Involucre ca. 6 mm; phyllaries whitish yellow.

- 3100–3600 m. E Gansu (Lintan), SW and W Sichuan, E Xizang (Bagong, Qamdo).


青海二色香青 qing hai er se xiang qing

All plants gray or white lanate. Leaves sparse; internodes 4–10 mm. Upper leaves expanding, 2.5–5 cm × 3–7 mm, apex rounded or obtuse. Involucre ca. 7 mm; phyllaries white or whitish yellow. Corolla 4–4.5 mm. Achene ca. 1.5 mm.

- 3000–3800 m. W Gansu (Xiahe), E Qinghai (Menyuan, Xinghai).


波缘二色香青 bo yuan er se xiang qing


Leaves obovate-linear, 2–4 cm × 4–5 mm, adaxially arachnoid hairy and with capitate glandular hairs with long stalk, margin usually undulate, expanding.

- About 2200 m. SW Sichuan (Xiangcheng), NW Yunnan (Zhongdian).


膜苞香青 mo bao xiang qing

Rhzmoile slender, somewhat woody; stolons ca. 12 cm, with brown squamiform leaves and terminal rosette leaves. Stems caespitose, erect, 15–45 cm, slender, unbranched, white or pallid arachnoid tomentose, rather sparsely leafy. Basal and lower leaves relatively small, caducous and lost by anthesis; middle leaves erect or somewhat expanding, oblongate-oblong or linear-oblong, 2.5–4.5 × 0.5–2 cm, base attenuate, decurrent on stem and becoming a narrow or cuneate wing, margin flat, apex obtuse or acute; upper leaves small, linear or linear-lanceolate, with some or withered cusp; all leaves thin, both surfaces tomentose or abaxially densely pallid arachnoid and mixed with tentacles, in conspicuously 3-veined. Capitula 7–10 or more, corymbiform, terminal on stems; peduncle 1–5 mm. Involucre campanulate, 6–7 × 5–6 mm; phyllaries 5- or 6-seriate, thin, base hyaline, apex white, not hyaline; outer phyllaries light brownish, ovate, ca. 3.5 mm, apex obtuse; middle ones elliptic-lanceolate, ca. 6 mm, apex acute; innermost ones lanceolate-linear, ca. 5.8 mm, with a claw ca. 1/3 or 1/2 of full length. Receptacle with fimbriolate appendage. Center of predominantly female capitula with female florets and a few male florets; pre-
dominantly male capitula with male florets only. Corolla ca. 4 mm. Pappus ca. 5 mm, male florets pappus relatively incrassate at tip of apex, dentate. Achene oblong, ca. 0.7 mm, with dense mamilla. Fl. Jul.

- Alpine hillside grasslands; 2500–2800 m. W Gansu (Qing-shui, Xiahe), N Sichuan (Aba, Songpan).

No specimens of this species were seen by the second author.


丽江香青 li jiang xiang qing


Rhizome relatively thickish, woody. Sobols and stolons with dense scalelike withered leaves and terminal rosette leaves, caespitose with flowering stems. Stems erect, 15–25 cm, slender, unbranched, densely ash-gray lanate, rather densely leafy. Basal and lower leaves caducous and lost by anthesis, small, spatulate-oblong; middle leaves dense, erect or spreading, oblong-lanceolate, 2–3 × 0.4–1 cm, base acute, dentent on stems and becoming a narrow or cuneate wing, usually semiamplexicaul, margin recurved when dry, apex acute, with small cusp; upper leaves linear-lanceolate; all leaves pallid or white lanate abaxially, dark green adaxially, appressed or arachnoid tomentose, sometimes glabrare, stout, midvein exserted abaxially, midvein and 3 veins flat or somewhat excavated adaxially, apical leaves 1-veined. Capitula 10–30, dense, corymbiform; peduncle 1–3 mm. Involucre campanulate, 6–8 × 5–6 mm; phyllaries 5- or 6-seriate; outer phyllaries brownish, oval-lanceolate, ca. 3.5 mm, arachnoid tomentose; middle ones oblong-lanceolate, 5–6 mm, ca. 2 mm wide in male florets, ca. 1.5 mm wide in female florets, white except for base (yellow when dried), apex obtuse or acute; innermost ones lingulate or lanceolate, ca. 4 mm, with a claw ca. 2/3 of full length. Receptacle with fimbriellate short hairs. Center of predominantly female capitula with female florets and 1–3 male florets; predominantly male capitula with male florets only. Corolla 3.5–4 mm. Pappus longer than corolla; upper part of pappus of male florets thickish and flat, dentate. Ovary 0.8–1 mm, almost glabrous. Achene oblong, ca. 0.7 mm, with dense mamilla. Fl. Aug.–Sep.

- Valleys, ditches, grasslands, under _Picea_ forests; 3100–3400 m. NW Yunnan (Heqing, Lijiang, Zhongdian).


细弱香青 xi ruo xiang qing

Rhizome woody. Stems erect or ascending, ca. 14 cm tall, ca. 1 mm in diam., white arachnoid tomentose, upper parts brownish pilose, unbranched, slender; internodes 7–11 mm. Leaves oblong-lanceolate or narrowly spatulate, abaxially arachnoid tomentose, adaxially green, glabrous, almost lustrous, 1-veined, base long cuneate, decurrent along stems and becoming a narrow wing, apex obtuse to truncate; lower leaves usually caducous and lost by anthesis, 4–13 × 2–2.5 mm, base slightly larger, erect to expanding; uppermost leaves linear, apex usually brownish scarious piliform. Capitula 4–6, terminal, corymbiform, dense, ca. 2 cm in diam.; peduncle absent or to 3 mm, white arachnoid tomentose. Involucre narrowly campanulate, 7.5–8 mm; phyllaries 4-seriate, all erect, apex obtuse; outer phyllaries reddish brown, oblanceolate, 4–5 mm; middle ones ca. 7 mm, base brown and red, apex white; innermost ones linear, 5.5–7 mm. Florets in center of capitulum sterile, ca. 3; corolla ca. 4 mm; pappus ca. 3 mm, incrassate at tip of apex. Outer florets ca. 8; corolla ca. 3.5 mm; pappus white, ca. 3.5 mm. Achene oblong, ca. 0.6 mm, glabrous.

- W Sichuan.

No specimens of this species were seen by the present authors. The description is based on the protologue, as well as work by Handel-Mazzetti (Notizbl. Bot. Gart. Berlin-Dahlem 13: 631. 1937).


江孜香青 jiang zi xiang qing

Rhizome slender, woody; stolons slender, with rufous lanate-celate scales and terminal rosette leaves. Stems erect from geniculate base, 30–40 cm, slender, usually curved, lower parts glabrous, slightly woody, upper parts arachnoid tomentose or lanate-piliferous, with lanate axillary buds and short branches, sparsely leafy. Lower leaves caducous and lost by anthesis; middle leaves oblong-linear, 4–5 × 0.3–0.5 mm, base equilateral or slightly narrow, dentent on stems and becoming a narrow wing, margin flat, apex acute or subrounded, with long cusp; upper leaves considerably small, ca. 1.5 × 0.3 cm; all leaves dark green, abaxially pallid thinly arachnoid tomentose and with capitate calilierous tentacles, adaxially arachnoid tomentose, later glabrous, upper leaves pubescent on both surfaces, midvein not conspicuous. Capitula small, 5 or 15–20, congested to globose-corymbiform synflorescences not exceeding upper leaves. Involucre broadly campanulate, ca. 7 mm; phyllaries 4- or 5-seriate; outer phyllaries purple-brownish, ovate; middle ones oval-lanceolate, upper parts white or slightly yellow, apex obtuse. Predominantly male capitula with male florets only. Ovary considerably small, glandular at apex; pappus longer than achene. Fl. Jul. 2n = 56*.

- Forests; ca. 3900 m. E and S Xizang (Baxoi, Gyantse, Shiquantang).

No specimens of this species were seen by the second author.


黄绿香青 huang lu xiang qing

Rhizome thickish, woody, ascending, upper parts densely withered leaves, with rosette leaves and densely caespitose flowering stems and sterile stems. Stems erect or ascending, 20–50 cm, lower parts woody, persistent, simple or branching at base or broken stems, with yellow capitate-stalked glandular hairs, arachnoid tomentose at lower parts, densely leafy. Rosette leaves obovate or oblong, ca. 1.5 × 0.5 cm, both surfaces ash-gray corynoid tomentose. Lower caline leaves caducous and lost by anthesis; middle leaves somewhat expanding, oblong or linear-lanceolate, 3–7 × 0.3–1 cm, base equilateral, dentent on stems and becoming a narrow or cuneate wing, margin flat, apex acute, with conspicuous cusp; leaves becoming smaller upward, erect or somewhat expanding, lanceolate-linear, acuminate, with withered scarious long cusp; all leaves yellow-
green, thin, with stalked glandular hairs on both surfaces, 3-veined, hairs around veins considerably long. Capitula numerous, dense, compound corymbose, terminal on stems and branches; peduncle slender. Involucre broadly campanulate, ca. 7 × 5–8 mm; phyllaries 4- or 5-seriate; outer phyllaries broadly ovate, ca. 3.5 mm, cottony tomentose; middle ones yellow-white, oblong, ca. 6 × 2.5 mm, base fulvous, apex obtuse or rounded; innermost ones oblong, ca. 5.5 mm, with a claw ca. 1/3 of full length. Receptacle with fimbriolate short hairs. Center of predominantly female capitula with female florets and 1–3 male florets; predominantly male capitula with male florets only. Corolla 4–4.5 mm. Pappus almost as long as corolla, male florets pappus incrustate at tip of apex, dentate. Achene oblong, ca. 1 mm, sparsely papillate. Fl. Jul–Sep.

- Subalpine or low hill grasslands, between rocks; 1800–3600 m. SW Sichuan (Chawalong, Jiualong, Muli), NW Yunnan.


雅致香青 ya zhi xiang qing

Rhiizome thickish, woody, ascending, upper parts densely withered leaves, with rosette leaves and caespitose flowering stems and sterile stems. Stems erect or ascending, 20–50 cm, lower parts woody, persistent, slightly slender, usually simple, with capitate-stalked glandular hairs and sparsely arachnoid hairy, densely hairy in upper parts, whole stems or lower parts densely leafy. Rosette leaves obovate or spatulate-elliptic, 0.7–1.5 × 0.3–0.5 cm, apex obtuse. Lower leaves caducous and lost by anthesis, oblong-spatulate, base attenuate and forming long-winged stalk, or base sheathlike; middle leaves elliptic or oblong-lanceolate, 3–5 × ca. 1 cm, base somewhat narrow or subrounded, decurrent on stems and becoming a narrow wing, margin flat, apex acute or obtuse, with small cusp; upper leaves slightly erect, linear-lanceolate, with withered long cusp; all leaves with capitate-stalked glandular hairs on both surfaces, white arachnoid tomentose at margin and abaxially, 3-veined, midvein thickish. Capitula numerous, dense, compound corymbiform, terminal on branches; peduncle 0.3–1 cm. Involucre broadly campanulate, 6–7 mm; phyllaries 4- or 5-seriate; outer phyllaries light brownish, ovate, ca. 3 mm, lance; middle ones ivory white or somewhat reddish, obovate-oblong, 5–6 × 2–3 mm, apex rounded; innermost ones spatulate-oblong, ca. 5 mm, with a claw ca. 1/2 of full length. Receptacle with fimbriolate short hairs. Center of predominantly female capitula with female florets and 4–6 male florets. Corolla 4–4.2 mm. Pappus almost equal to corolla; upper parts of male florets pappus considerably incrassate at tip of apex, serrulate. Achene oblong, ca. 1.2 mm, papillate. Fl. Jul–Aug.

- Sunny hillside gravel slopes; 3100–3200 m. W Sichuan (Dêqên), NW Yunnan (Zhongdian).

No specimens of this species were seen by the second author.


香青 xiang qing

Rhiizome slender or thickish, woody, runners ca. 8 cm. Stems laxly or densely caespitose, erect, 20–50 cm, slender or thickish, usually simple or branching after efflorescence or on broken branches, white or ash-gray cottony tomentose, densely leafy. Rosette leaves densely lanate, apex obtuse or rounded. Lower leaves caducous and lost by anthesis; middle leaves oblong-oblong-elliptic, or linear, 2.5–9 × 0.2–1.5 cm, base attenuate, decurrent on stems and becoming a narrow or slightly broad wing, margin flat, apex acute, with short and small cusp; upper leaves smaller, lanceolate-linear or linear; all leaves arachnoid lanate, or densely white or yellow-white lanate abaxially or on both surfaces, mixed with glandular hairs, 1- or 3-veined with lateral veins vanishing. Capitula numerous, dense compound corymbiform or polygynous corymbiform; peduncle slender. Involucre campanulate or almost obconical, 4–5(–6) × 4–6 mm; phyllaries 6- or 7-seriate; outer phyllaries light brownish, ovate, ca. 2 mm, arachnoid tomentose; middle ones milky white or dirty white, lingulate-oblong, ca. 3.5 × 1–1.2 mm, apex obtuse or rounded; innermost ones narrower, narrowly elliptic, with a claw ca. 2/3 of full length; phyllaries in male florets usually obtuse. Center of predominantly female capitula with female florets and 1–4 male florets. Corolla 2.8–3 mm. Pappus slightly longer than corolla, incrassate at tip of apex in male florets, serrate. Achene 0.7–1 mm, with small gland. Fl. Jul–Sep, fr. Aug–Oct.

Low hill or subalpine shrub forests, grasslands, hillside, slopes, banks, riversides; 400–2100 m. S Anhui, Fujian, Gansu, Guangxi, Gui-
This is a widespread, extremely variable species. It is similar to *Anaphalis aureopunctata* but differs in being usually taller and more robust and having leaves denser, involucre smaller, and phyllaries more layered with base beige or gray-brown.

1a. Stems laxly caespitose, 20–50 cm, internodes 5–20 mm; synflorescence dense or expanding; phyllaries white, rarely red.

2a. Leaves oblong or oblong-lanceolate-oblong; internodes 5–10 mm

2b. Leaves lanceolate, linear-oblong, or linear; internodes 10–20 mm, longer on upper stems

1b. Stems densely caespitose, branched from rhizome, ca. 20 cm, internodes 2–10 mm; synflorescence dense; phyllaries white or weakly red.

3a. Leaves green and sparsely lanate adaxially, densely lanate abaxially

3b. Leaves and stems densely white thickish lanate

21a. *Anaphalis sinica* var. *sinica*


Rhzome long. Stems erect, 20–45 cm, lower parts thickish and woody, branching at base or having slender branches at lower axils, with long flowering branches at upper parts, densely hairy, lower leaves dense and upper leaves sparse. Rosette leaves obovate, ca. 1.5 × 1 cm, base cuneate and becoming short stalk; lower leaves caducous and lost by anthesis; middle leaves obovate, oblong-lanceolate-spatulate, or oblong, 3–7 × 0.8–2 cm, base attenuate and forming a petiole, or almost equal width and base cuneate, semiamplexicaul, decurrent on stem and becoming a short wing, margin smooth, apex obtuse or rounded, rarely acute; upper leaves bractlike, lanceolate-linear or linear, apiculate; all leaves slightly thickish, ash-gray arachnoid lanate, mixed with capitule shortly stalked glandular hairs, midvein raised on both surfaces, conspicuously 3-veined or with another pair of veins near margin. Capitula considerably numerous and dense, compound corymbiform, terminal on stems and branches; peduncle ca. 3 mm. Involute narrowly campanulate, 4–5 × 4 cm; phyllaries 5-seriate; outer phyllaries light brownish, ovate, ca. 2.5 mm, arachnoid tomentose; middle ones white or dirty white, oblong-lingulate, ca. 4 × 1–1.3 mm, apex rounded-obtuse; innermost ones narrowly oblong, ca. 3.5 mm, with a claw ca. 2/3 of full length. Receptacle with fimbriate appendage. Center of predominantly female capitula with female florets and 1 or 2 male florets. Corolla 2.5–3 mm. Pappus slightly longer than corolla. Achene oblong, ca. 0.8 mm, papillate. Fl. and fr. Aug.

This variety is similar to *Anaphalis sinica* var. *densata*.


Stems laxly caespitose; internodes 10–20 mm. Leaves lanceolate, linear-oblong, or linear, 4–9 × 0.5–1.5 cm, abaxially densely white or whitish yellow lanate, adaxially sparsely lanate, base attenuate, decurrent on stems and becoming narrow lanceolate. Phyllaries white.

- Hill or mountain woods, grasslands, slopes, banks; 400–2000 m. S Anhui, Guangxi, W Hubei (Fangxian, Lichuan), E and S Hunan, S Jiangsu, W Jiangxi, NE Sichuan (Wanyuan), Zhejiang [Japan, Korea].

This taxon is widespread in Asia and is extremely variable.

竟生香青 jing sheng xiang qing

Herbs, perennial. Rhizome unknown. Stems erect or arculate, ca. 25 cm or more, lower stems 4–5 mm in diam., densely gray lanuginous, simple or upper part 1- or 2-branched, 4–9 cm, with sparse leaves; internode 1.5–2 cm. Lower leaves usually withered in anthesis; middle leaves broadly elliptic or suborbicular, 5–6.5 × 3–4 cm, base sharply narrowed to winged petiole, dilated and amplexicaul, margin flat, apex acute or subrounded, rarely acuminate; upper leaves gradually diminutive, oblate-spatulate or oblate-spatulate-oblong, 5–6 × 1.3–2 cm, base attenuate to broadly winged petiole, amplexicaul, apex acuminate with tip; all leaves thick, both surfaces densely yellowish gray lanate, intermixed with villiform glandular hairs, 3- or 5-veined, lateral veins 1 or 2 pairs, midvein prominent abaxially. Capitula few, compound corymbose, 1.5–3 cm in diam.; peduncle 2–3 mm, densely tomentose. Involucre narrowly campanulate, 4–5 × 3–4 mm; phyllaries ca. 5-seriate; outer phyllaries beige, ovate, 1.5–2 mm, arachnoid; middle ones sordid white, elliptic-oblong, 2.5–3 × 1–1.2 mm, apex rounded, or rarely 3-denticulate; innermost ones narrowly oblong or linear, ca. 3.5 mm, with green vittate claw. Capitula with heteromorphic florets, outer with many female florets, center with 1 or 2 male florets; male floret corolla tubular, female floret corolla filiform; pappus white, slightly exserted to corolla, in male slightly thick, in female setaceous. Achene brown, oblong, 0.7–0.8 mm, mamillate. Fl. Sep.

- Canal sides, roadsides; ca. 3700 m. Xizang (Gongbo’gyamda).

No specimens of this species were seen by the second author.


能高香青 neng gao xiang qing

Rhizome ascending. Stems solitary, not caespitose, erect, 10–18 cm, unbranched, densely lanate, with leaves at apex. Rosette leaves at base, caducous and lost by anthesis, smaller than middle leaves; leaves erect, light green abaxially, green adaxially, narrowly oblong, 3–4 cm × 9–12 mm, thin, both surfaces lanate and scabrid, base decurrent on stem and becoming a broad short wing, margin flat, apex acute; upper leaves smaller. Synflorescence dense, corymbose. Involucrre hemispheric when dry, ca. 5 × 9 mm; phyllaries 5-seriate, middle ones longest, longer than floret, apex obtuse, middle to apex white, somewhat brownish abaxially. Capitula with heteromorphic florets; female florets numerous and present in margin, corolla ca. 2.5 mm, pappus thinly scabrid hairy; male florets fewer, tubular, apex glandular, pappus dirty white, apex slightly thickish. Receptacle glabrous. Achene unknown. Fl. Aug.–Oct.

- Taiwan.

No specimens of this species were seen by the present authors.


黄腺香青 huang xian xiang qing

Rhizome slender or somewhat thickish; runner ca. 12 cm, or rarely to 20 cm. Stems erect or ascending, 20–50 cm, slender or thickish, simple, rarely with erect flowering branches after efflorescence, herbaceous or woody at base, white or pallid arachnoid tomentose, or lower parts somewhat glabrous. Lower leaves dense or upper leaves lax; rosette leaves broadly spatulate-elliptic, lower part attenuate and becoming a long stalk, usually densely lanate. Lower leaves caducous and lost by anthesis, spatulate or lanceolate-elliptic, with winged stalk, 5–16 × 1–6 cm; middle leaves slightly smaller, somewhat spreading, base attenuate, decurrent on stem and becoming a wide or narrow wing, margin flat, apex acute or rarely acuminate, with mucro or long cusp; upper leaves small, lanceolate-linear; all leaves white or pallid arachnoid hairy with tentacles, lanate, or glabrous abaxially, cauli-feronate lanate and easily deciduous arachnoid adaxially, 3- or 5-veined, lateral veins conspicuous and reaching margin or disappearing at margin, or 1-veined. Capitula numerous, dense, compound corymbose; peduncle slender. Involucrre campanulate or narrowly campanulate, 5–6 × ca. 5 mm; phyllaries ca. 5-seriate; outer phyllaries light or dark brownish, ovate, ca. 2 mm, lanate; middle ones white or yellow-white, ca. 5 mm, apex broadly rounded in male florets. 2.5 mm wide, apex obtuse or acute in female florets, ca. 1.5 mm wide; innermost ones slightly narrow and short, spatulate or oblong, with a claw ca. 2/3 of full length. Receptacle with fimbriate appendage. Center of predominantly female capitula with female florets and 3 or 4 male florets; predominantly male capitula with male florets only or 3 or 4 female florets present in outer layer. Corolla 3–3.5 mm. Pappus slightly longer than corolla, incrassate at tip of apex in male florets, serrulate. Achene ca. 1 mm, villosulous. Fl. Jul.–Sep., fr. Sep.–Oct.

- Forests, forest margins, hills, grasslands, bamboo or grassy slopes, rocky places, valleys, wetlands; 1000–4200 m. S Gansu, N Guangdong, N Guangxi, Guizhou, W Henan, W Hubi, SW and W Hunan, NW Jiangxi, E Qinghai, S Shaanxi, S Shanxi, Sichuan, Yunnan.

No specimens of this species were seen by the second author.

This species is similar to Anaphalis sinica but differs in having stems herbaceous, only sometimes slightly woody at base, leaves dense on lower stems, internode longer on upper stems; involucrre large, especially in male plants, phyllaries large and broadly rounded; and leaves with long lateral veins.

1a. Phyllaries yellowish white, base black-brown or purple-brown .......................... 25d. var. atrata
1b. Phyllaries white or yellowish white, base beige after desiccation.

2a. Leaves abaxially densely lanate, 3-veined to apex .......................... 25c. var. tomentosa
2b. Leaves abaxially arachnoid hairy or glabrous, 1-, 3-, or 5-veined.

3a. Leaves narrow, 3-veined or sometimes 1-veined ....................................... 25a. var. aureopunctata
3b. Leaves broad, 5-veined to apex, upper leaves 3-veined .......................... 25b. var. plantaginifolia
25a. Anaphalis aureopunctata var. aureopunctata

Huang xian xiang qing (原变种) huang xian xiang qing (yuan bian zhong)

Anaphalis aureopunctata E. calvensis (Pampanini) Y. L. Chen; A. pterocaulon (Franchet & Savatier) Maximowicz var. calvensis Pampanini; A. pterocaulon var. intermedia Pampanini; A. sinica Hance var. calvensis (Pampanini) S. Y. Hu; A. sinica subsp. intermedia (Pampanini) Kitamura.

Stems slender or thickish, arachnoid lanate or somewhat glabrous on lower parts. Leaf shape variable, or lower leaves elliptic-spatulate or broadly elliptic, with winged petiole; middle leaves oblong-lanceolate or oblancoate, 5–12 × 1–2.5 cm; all leaves 3-veined, lateral veins not reaching apex, or sometimes linear and 1-veined, abaxially arachnoid or thinly lanate or glabrous.

- Forests, forest margins, grasslands, valleys, rocky places; 1200–3600 m. S Gansu (Chengxian, Yuzhong), N Guangdong (Lechang, Renhua), N Guangxi (Rongshui), Guizhou (Panxian), S Shaanxi (Huxian, Lieyang), S Shanxi (Yuanyu), Sichuan, E to W Yunnan.


Che qian ye huang xian xiang qing

Stems thickish, with arachnoid adnate hairs. Lower or middle leaves broadly elliptic, base attenuate to long petiole, 6–16 cm × 2–6 mm, both surfaces at first with arachnoid or stalked glandular hairs, later glabrous except along veins abaxially, 5-veined, and lateral veins reaching apex; upper leaves small, elliptic to linear-lanceolate, (1 or)3-veined.

- Hills, wetlands; 1000–2700 m. W Hubei (Sangzhi), W Hunan (Baoping), NW Jiangxi (Huanglong Shan), S Sichuan (Emei).


Rong mao huan xian xiang qing

Anaphalis sinica var. tomentosa (Handel-Mazzetti) Kitamura.

Stems thickish, arachnoid hairy. Lower and middle leaves broadly elliptic, spatulate to lanceolate-elliptic, 5–9 × 2–4 cm, abaxially densely white or gray lanate and with rust-colored hairs along veins, adaxially with arachnoid and capitate-stalked glandular hairs, 3-veined up to apex, base sharply narrowed to broad wing. Phyllaries base beige.

- Forests, bamboo slopes; 2100–3800 m. Guizhou (Fanjing Shan), W Hubei, S Shaanxi (Taibai Shan), Sichuan, Yunnan.


Hei lin huang xian xiang qing


Stems thickish or slender. Leaves stenophyllous, spatulate or oblancoate-elliptic, abaxially densely white or gray lanate, adaxially with arachnoid and glandular hairs, 3-veined, base gradually narrow, apex acute. Phyllaries yellowish white, dried base puce or purple-brown.

- Alpine forests, grassy and rocky slopes; 3000–4200 m. S W Sichuan (Kangding, Mulu), NW Yunnan.

This taxon is an alpine type, easily distinguishable from the above varieties.


Wei ruan xiang qing

Rhizome slender, slightly woody; stolons slender, with smaller leaves or terminal rosette leaves. Stems caespitose, erect from geniculate base, 20–30 cm, slender, usually curved, simple or with few synflorescence branches, herbaceous, pallid arachnoid villos, lower leaves dense and upper leaves lax. Lower leaves caducous and lost by anthesis, narrowly spatulate, base acuminate and becoming a long stalk, ca. 5 × 0.8 cm; middle and upper leaves erect or spreading, linear-spatulate or linear, 2.5–5 × 0.2–0.5 cm, base attenuate or equalateral, decurrent on stem and becoming a narrow wing, margin flat, apex obtuse or rounded, with small cusp; all leaves pallid arachnoid lanate on both surfaces, inconspicuously 3-veined. Capitula numerous, compound corymbose, terminal on stems and branches; peduncle 1–3 mm. Involucral campanulate, 4–5 × 4–5 mm; phyllaries 4- or 5-seriate; outer phyllaries light fulvous, elliptic, ca. 2 mm, lanate, apex obtuse; middle ones oblong or elliptic, 4–5 × 1–1.5 mm, upper parts white, apex obtuse or acute, sometimes lacerate, lower parts membranous, subhyaline; innermost ones narrowly oblong, ca. 4 mm, with a claw ca. 2/3 of full length. Receptacle with fimbriate short hairs. Center of predominantly female capitula with female florets and 1–6 male florets. Corolla 2.5–3 mm. Pappus slightly longer than corolla. Achenes suberete, ca. 0.7 mm, villosulous and with small glandular spot. Fl. and fr. Jun–Aug.

- Peaks, hillside grasslands, shrub forests; 1800–2400 m. W Guizhou (Weining), Sichuan, NE Yunnan.

No specimens of this species were seen by the second author.


San fang xiang qing

Rhizome slender, repent, stolons slender, with lanceolate membranous scales and terminal rosette leaves. Stems erect or ascending, 7–16 cm, considerably slender, simple or with synflorescence branches, white arachnoid piliferous, with slender sulcus, lower leaves dense and upper leaves lax. Basal leaves caducous and lost by anthesis, almost homomorphic with rosette leaves, obovate or spatulate, 0.5–1(−2) × 0.4(–0.8) cm, base cuneate, apex rounded and obtuse; middle leaves oblancoate-oblong or elliptic, 2–4 × 0.3–0.8 cm, base attenuate and decurrent along stem and becoming a short wing, margin smooth, apex acute or obtuse, mucronulate; upper leaves stenophyllous, linear-lanceolate, with long cusp; all leaves densely
pallid arachnoid lanate abaxially, green and arachnoid piliferous adaxially, usually later glabrous, midvein exserted abaxially, conspicuously 3-veined. Capitula numerous, 2–5 congested on terminal or branch, compound corymbiform; peduncle 1–4 mm. Involucre campanulate, 4.5–5 × 4–5 mm; phyllaries 5- or 6-seriate; outer phyllaries deep brownish, broadly ovate, 1.5–2 mm, base arachnoid piliferous, apex obtuse; middle ones oblong-lanceolate, 4.5–5 × 1.5–2.2 mm, base light brownish, upper parts white, apex obtuse; innermost ones linear, 3.5–4 mm, with a claw ca. 2/3 of full length. Receptacle with filibrillate appendage. Center of predominantly female capitula with female florets and 1 or 2 male florets; predominantly male capitula with 12 or 13 male florets. Corolla 3–3.5 mm, rarely ca. 2 mm. Pappus slightly longer than corolla, incrassate at tip of apex in male florets. Ovary somewhat ovoid, ca. 0.5 mm, almost glabrous. Fl. Jun–Jul.

Alpine grasslands and deserts; 3000–3200 m. NW Yunnan (Njiang) [N Myanmar].

No specimens of this species were seen by the second author.


Herbs, perennial, throughout densely silvery gray tangled to cottony lanate. Rhizome thickish, woody; branches short, with dense withered leaves, rosette leaves terminal. Stems erect from curved base, 20–50 cm, somewhat thickish, herbaceous, piliferous, lower leaves dense and upper leaves lax. Rosette leaves spatulate or obovate-oblong, 3–7 × 0.6–1.4 cm, at first yellowish white or gray lanate, later gradually tangled to cottony-papery hairy, base attenuate and becoming a long stalk, apex obtuse or rounded. Lower leaves almost homomorphic with rosette leaves, caducous and lost by anthesis; middle leaves somewhat erect, spatulate or linear-oblong, 3–7 × 0.3–0.8 cm, base somewhat narrow, decurrent on stem and becoming a narrow wing, margin subacute, apex acute; upper leaves linear, with long cusp; all leaves 1- or 3-veined, midvein exserted abaxially. Capitula considerably numerous, terminal on stems and branches, compound corymbiform; peduncle ca. 4 mm. Involucre campanulate, 4.5–5 × 3–4 mm; phyllaries 5-seriate; outer phyllaries oval, ca. 3 mm, base fulvous or deep brownish, lanate; middle ones white (lutescent when dry), oblong, ca. 4.5 × 1.5 mm, apex rounded; innermost ones linear-oblong, ca. 3 mm, with a claw ca. 2/3 of full length. Receptacle alveolate, with cusp. Center of predominantly female capitula with female florets and 1 or few male florets; predominantly male capitula with male florets only. Corolla 2–3 mm. Pappus ca. 3 mm, somewhat incrassate at tip of apex in male florets, serrulate. Achene ca. 0.9 mm, papillate. Fl. Jul–Sep, fr. Sep–Oct.

● Alpine or subalpine grassy slopes; 3200–3800 m. SW Sichuan (Muli).

No specimens of this species were seen by the second author.


Rhizome thickish, shrublike, branching; sobols numerous, with withered leaves at upper parts, rosette leaves terminal, with densely caespitose flowering stems. Stems erect, 15–35 cm, slender, simple, woody at base, usually persistent, arachnoid laxly lanate and with capitiate cauliforous tentacles, somewhat glabrous at lower parts, densely leafy. Lower leaves shorter and caducous and lost by anthesis; middle leaves somewhat spreading, linear, 2.35 × 0.3–0.35 cm, base decurrent and becoming a narrow and long wing, margin sinuous and recurved, apex slightly obtuse; upper leaves small, acuminate; all leaves densely white lanate abaxially, green adaxially, with capitiate cauliforous tentacles, 1-veined, somewhat raised abaxially. Capitula 10 or numerous, terminal on stems and branches, compound corymbiform; peduncle absent; common peduncle of synflorescence white lanate. Involucre narrowly campanulate, 4–6 × 3–4 mm; phyllaries 4- or 5-seriate; outer phyllaries light or deep brownish, broadly ovate, ca. 2.5 mm, irregularly toothed-scissile, lanate; middle ones light lutescent, elliptic, 4.2–5 × ca. 2 mm, apex rounded and obtuse; innermost ones spatulate-linear, somewhat short, with a claw ca. 2/3 of full length. Involucre of female florets usually small. Receptacle with filibrillate short hairs. Center of predominantly female capitula with female florets and 1–4 male florets; predominantly male capitula with male florets only. Corolla 3.5–4 mm. Pappus slightly equal to corolla, incrassate at tip of apex in male florets, dentate. Achene oblong, ca. 0.8 mm, villosulous. Fl. Jul–Aug, fr. Aug-Sep.

● Sunny alpine and subalpine conifer forests, shrub forests or hillsides. S Xizang.

No specimens of this species were seen by the second author.


Meng tiao xiang qing

Anaphalis pterocaulon (Franchet & Savatier) Maximowicz var. surculosa Handel-Mazzetti, Symb. Sin. 7: 1103. 1936.

Rhizome thickish, woody. Stems 50–100 cm, lower parts repent or ascending, woody, persistent, stems with ascending branches, thickish, channeled and angulate, herbaceous, arachnoid hairy, and with capitulate stalked glandular hairs, lower parts usually glabrous, usually with tomentose axillary or short branches, densely leafy. Lower leaves caducous and lost by anthesis; middle leaves spreading, linear, linear-lanceolate, or oblong, 3.8–5 × 0.5–1(–1.5) cm, base attenuate, decurrent on stem and becoming a 1.5–3 mm wide or cuneate wing, margin flat or undulate, apex acute, with long cusp; upper leaves small; uppermost leaves linear or subulate, acuminate, bractlike; all leaves thin, with capitulate stalked glandular hairs or arachnoid hairy on both surfaces, or only abaxially or glandular abaxially, 3-veined. Capitula considerably numerous, dense, compound corymbiform; peduncle short or ca. 3 mm. Involucre subcampanulate, 4.5–5 × 3–4 mm; phyllaries 6-seriate; outer phyllaries light brownish, ovate, ca. 2 mm; middle ones white, elliptic or spatulate-elliptic, ca. 4 mm, less than 1.5 mm in female florets, apex rounded; innermost ones white, subspatulate, ca. 4 mm, with a claw ca. 2/3 of full length. Receptacle chaffy hairy. Center of predominantly female capitula with female florets...
and 1 or 2 male florets; predominantly male capitula with male florets only. Pappus slightly longer than corolla, incrassate at tip of apex in male florets, dentate. Achene oblong, ca. 1 mm, hairy and glandular. Fl. Jul–Oct, fr. Sep–Oct.

- Low hill or subalpine grasslands and shrub forests; 100–2700 m. NW and W Sichuan, NW Yunnan (Dêqên).


德钦香青 de qin xiang qing

Rhizome slender, woody; sobols short, with membranous oval squamiform leaves, rosette leaves terminal. Stems caespitose, erect, 1–30 cm, slender, channeled, herbaceous, white arachnoid lanate, lower parts glabrous, simple, densely leafy. Lower leaves caducous and lost by anthesis; middle and upper leaves broad and large, spreading, oblanceolate-elliptic to oblong-lanceolate, 2.5–4 × 0.7–1.2 cm, base attenuate or cuneate, decurrent on stem and becoming a short cuneate wing, margin flat, apex acute, with small cusp; apical leaves smaller; all leaves growing in upper part, with slender root. Stems few (3 or 4), caespitose, erect, 23–30 cm, slightly slender, simple, white pallid tomentose, densely leafy in upper parts. Lower leaves square, oblong, withered in efflorescence; leaves gradually larger from middle part to apex of stem, slightly expanding, oblong-lanceolate, 2.5–5 × 3–6 mm, base attenuate, almost not decurrent, margin flat, apex acute with short cusp; uppermost leaves as large as or smaller than middle leaves, densely arranged in synflorescence, radiate; all leaves yellowish white, both surfaces tomentose, 3-veined; midvein slightly convex on both surfaces. Capitula 3–5, densely arranged at tops of stems, compound corymbiform, without peduncle. Involucre campanulate, 5–6 × ca. 5 mm; phyllaries 4- or 5-seriate, mauve or margin white; outer phyllaries ovate-elliptic, ca. 5 × 2 mm, apex obtuse or lacerate; middle ones oblong, ca. 5.5 mm, keeled, clawed; innermost ones linear-oblong, ca. 4 mm, with a ca. 3/4 of full length claw, apex lacerate. Receptacle with fimbriate short hairs. Capitula with numerous marginal female florets, center of predominantly female capitula with 3–6 male florets. Corolla tube ca. 3.2 mm, upper parts mauve. Pappus slightly exceeding corolla. Ovary ca. 0.5 mm, glabrous. Achenes not seen. Fl. Aug–Sep.

- Alpine or subalpine dry slopes; 3000–4300 m. NW Yunnan (Dêqên).

No specimens of this species were seen by the second author.


锐叶香青 rui ye xiang qing

Rhizome arranged horizontally; runners short, with brownish lanceolate squamiform leaves and dense slender roots. Stems caespitose, erect, 16–30 cm, slender, usually slightly twisted, simple or with short sterile branches, arachnoid lanate or usually glabrate on lower parts; upper parts densely leafy. Lower leaves caducous and lost by anthesis, oblong-lanceolate, 1–1.5 cm, abaxially sparsely lanate; middle and upper leaves becoming large, spreading, elliptic or oblong-lanceolate, 2.5–5 × 0.5–1 cm, base attenuate, almost not decurrent, margin flat, apex acuminate, with brownish long cusp 1–1.5 mm, apical and middle leaves somewhat equal in length; all leaves gray-brownish and fulvous lanate abaxially, brownish lanate and usually glabrescent adaxially, 3-veined, midvein slender, usually glabrous abaxially. Capitula 3–9, terminal or axillary, dense, corymbiform, 1.5–2 cm in diam., or laxly compound corymbiform with long peduncle. Involucre broadly campanulate, ca. 5 × 5–6 mm; phyllaries 5- or 6-seriate; outer phyllaries light brownish, ovate, thick, scarios, apex obtuse, white; middle ones white in upper parts, ovate-lanceolate, ca. 4 × 2.5 mm, apex obtuse, with longitudinal corrugation; innermost ones narrowly lanceolate, with a claw ca. 1/2 of full length. Receptacle with fimbriate short hairs. Predominantly male capitula with male florets only or 1–3 female florets present in outer layer. Corolla ca. 3.5 mm in male florets and ca. 3.8 mm in female florets. Pappus almost as long as corolla, slightly incrassate at tip of apex in male florets, dentate. Ovary 0.8–1.2 mm, with small glandular spots. Fl. Sep–Oct.

- Alpine or subalpine dry slopes; 3000–4300 m. NW Yunnan (Dêqên).

No specimens of this species were seen by the second author.


紫苞香青 zi bao xiang qing

Rhizome repent or ascending, brown squamate; withered leaves growing in upper part, with slender root. Stems few (3 or 4), caespitose, erect, 23–30 cm, slightly slender, simple, white pallid tomentose, densely leafy in upper parts. Lower leaves square, oblong, withered in efflorescence; leaves gradually larger from middle part to apex of stem, slightly expanding, oblong-lanceolate, 2.5–5 × 3–6 mm, base attenuate, almost not decurrent, margin flat, apex acute with short cusp; uppermost leaves as large as or smaller than middle leaves, densely arranged in synflorescence, radiate; all leaves yellowish white, both surfaces tomentose, 3-veined; midvein slightly convex on both surfaces. Capitula 3–5, densely arranged at tops of stems, compound corymbiform, without peduncle. Involucre campanulate, 5–6 × ca. 5 mm; phyllaries 4- or 5-seriate, mauve or margin white; outer phyllaries ovate-elliptic, ca. 5 × 2 mm, apex obtuse or lacerate; middle ones oblong, ca. 5.5 mm, keeled, clawed; innermost ones linear-oblong, ca. 4 mm, with a ca. 3/4 of full length claw, apex lacerate. Receptacle with fimbriate short hairs. Capitula with numerous marginal female florets, center of predominantly female capitula with 3–6 male florets. Corolla tube ca. 3.2 mm, upper parts mauve. Pappus slightly exceeding corolla. Ovary ca. 0.5 mm, glabrous. Achenes not seen. Fl. Aug–Sep.

- Alpine meadows; ca. 4000 m. E Xizang.

No specimens of this species were seen by the second author.


云南香青 yun nan xiang qing

**Gnaphalium yunnanense** Franchet, J. Bot. (Morot) 10: 410. 1896.

Subshrubs, multibranched. Rhizome thickish, contorted; sobol or sterile branches erect or ascending, with withered marcescent leaves and axillary or acrogenous floriferous stems. Floriferous stems erect, 10–20 cm, white pallid arachnoid tomentose, rather densely leafy. Basal leaves or sobol arachnoid leaves rather short, spatulate or spatulate-oblong, 0.5–1.5 cm × 3–5 mm, rounded at apex; middle and upper leaves oblong-spatulate, 2–4 cm × 2–5 mm, base attenuate, decurrent on stem to a narrow wing, margin flat, apex obtuse or acute, with indis-
tinct short cusp; uppermost leaves somewhat erect, acuminate, with short cusp; all leaves pallid yellowish white tomentose on both surfaces, 1-veined or distinctly 3-veined. Capitula numerous, densely compound corymbiform; peduncle rather short. Involucre broadly campanulate, 6–7 × 4–6 mm; phyllaries ca. 5-seriate; outer phyllaries brown or dark brown, oval-lanceolate, ca. 3 mm, arachnoid; middle ones elliptic-lanceolate, ca. 5 × 1.5 mm, apex obtuse or slightly rounded, white or yellowish white; innermost ones linear-oblong, ca. 4 mm, with a ca. 2/3 of full length claw. Receptacle with fimbrillate short hairs. Capitula with numerous marginal female florets, center of predominantly female capitula with 1 or 2 male florets. Corolla tube 2.5–3 mm. Pappus slightly exceeding corolla, incrassate at tip of apex in male florets. Achenes oblong, ca. 1.5 mm, densely papillose. Fl. Jun–Sep, fr. Aug–Sep.

SW Sichuan, NW Yunnan [Nepal].


木里香青 mu li xiang qing


Subshrubs, multibranched, 10–20 cm tall. Rhizome thickish; solob or sterile branches erect or ascending, white arachnoid tomentose, later glabrous, with dense leaves, and with tomentose acrogenous buds; cauline leaves oblong or linear-lanceolate, 1–2 cm × 1–3 mm, slightly decurrent, somewhat revolute on margin, witherred, marcescent. Floriferous branches growing at tip of sterile branch, 4–10 cm, slender, white tomentose, densely leafy in lower parts. Basal leaves obovate-oblong, rosulate; middle leaves obovate or linear-oblong, 1.5–3.5 cm × 2–4 mm, base attenuate, decurrent on stem into a narrow wing, margin flat or slightly revolute, apex obtuse or rounded, with indistinct cusp; upper leaves erect or expanding, with withered long cusp; all leaves white tomentose abaxially, arachnoid adaxially or sometimes glabrous, midvein slightly convex abaxially. Capitula 5–25, densely compound corymbiform; peduncle rather short. Involucre broadly campanulate, 6–7 × 5–7 mm; phyllaries 4- or 5-seriate; outer phyllaries rufous, ovate, 3–4 mm, apex rounded; middle ones spathulate or elliptic, ca. 7 × 2.5 mm, apex obtuse or slightly rounded; innermost ones spatulate, slightly short, with a ca. 2/3 of full length claw. Receptacle with membranous appendages. Capitula with numerous marginal female florets, center of predominantly female capitula with 1 or 2 male florets. Corolla tube 3–3.5 mm. Pappus slightly exceeding corolla, incrassate at tip of apex in male florets. Achenes oblong, ca. 1.5 mm, glabrous. Fl. Jun–Sep, fr. Sep–Oct.

Alpine taiga, rocky places, grasslands; 3400–4000 m. SW Sichuan (Jiulong, Muli), NW Yunnan (Zhongdian) [Nepal].


亚 Şimdi木香青 ya guan mu xiang qing

Subshrubs, small, multibranched, 40–60 cm tall. Rhizome thickish; solob or sterile stem erect or ascending, cinerous arachnoid tomentose, often denuded, with fertile axillary buds or short branches and sparse leaves. Leaves expanding or ad-herent to stem, spatulate-obovate or spatulate, 1–2(–3) cm × 5–10 mm, thick, both surfaces pallid or white tomentose, or adaxially pallid arachnoid tomentose, distinctly 3-veined, lateral veins slender, midvein slightly convex abaxially, base decurrent on stem into a narrow long wing, margin flat or slightly revolute, apex obtuse or rounded, with brown cusp; leaves on sterile stems long hairy. Capitula numerous, densely compound corymbiform; peduncle short. Involucre narrowly campanulate, 4–5 × 2–3 mm; phyllaries ca. 6-seriate, imbricate; outer phyllaries white or light red, narrowly ovate, ca. 2 mm; middle ones spatulate-elliptic, 3–3.5 mm, apex rounded; innermost ones linear-lanceolate, with a ca. 2/3 of full length claw. Receptacle with fimbrillate short hairs. Capitula with numerous marginal female florets, center of predominantly female capitula with 1 or 2 male florets. Corolla tube ca. 3 mm. Pappus slightly shorter than corolla, incrassate at tip of apex in male florets. Achenes glabrous. Fl. Aug.

● Low mountain or subalpine valleys, slope grasslands; 1800–3100 m. NW Yunnan (Lijiang, Zhongdian).

No specimens of this species were seen by the second author.

Male plants were not seen by the present authors. According to the protologue, this species has 1-veined leaves.


狭苞香青 xia bao xiang qing

Subshrubs, multibranched, ca. 60 cm tall. Rhizome thickish, with numerous sterile branches or floriferous branches, erect or ascending; sterile branches short, whitish cinerous tomentose, herbaceous. Floriferous branches or annual branches somewhat woody, often glabrous, with sulcus; internode 0.5–1 cm, rarely up to 1.5 cm; axillary buds growing into short densely foliate branches after efflorescence. Leaves expanding, elliptic or oblong-linear, 1.5–3 × 0.3–0.5 cm, abaxially thickly white or ochroleucous tomentose, adaxially arachnoid tomentose, indistinctly 1- or 3-veined, midvein slightly convex abaxially; base attenuate, decurrent on stem into a long and narrow wing, margin flat or slightly revolute, apex obtuse or slightly acute; upper leaves gradually smaller, apex obtuse or with brown cusp. Capsula without peduncle or with a short peduncle, 9 to numerous capitula densely forming corymbiform synflorescence, 1.5–4 cm in diam. Involucre cylindric, 4–5 × 2–3 mm; phyllaries ca. 5-seriate, imbricate; outer phyllaries usually brown, broadly ovate, ca. 2.5 mm, arachnoid tomentose; middle ones white, oblong-spatulate, 3.5–4 mm; innermost ones spatulate-linear, with a 2/3 or 3/4 of full length claw. Receptacle with fimbrillate appendage. Predominantly female capitula with numerous marginal female florets, center with 1–3 male florets; predominantly male capitula with male florets only. Corolla tube ca. 3 mm. Pappus white, slightly exceeding corolla, incrassate at tip of apex in male florets, serrulate. Achenes oblong, ca. 1 mm, papillose. Fl. and fr. Jul–Aug.

● Subalpine regions, Pinus forests. SE Xizang (Cawarong), NW Yunnan (Dêqên).
No specimens of this species were seen by the second author.


纤枝香青 xian zhi xiang qing

Subshrubs. Rhizome thickish; sobols or sterile stems erect or ascending, densely withered, marcescent leafy and with distinct axillary buds and terminal buds. Flowering stems arising from axillary buds, 5–40 cm or more, often slender, upper parts herbaceous, simple, tomentose or cauliforous glandular pilose, sparsely leafy. Leaves expanding or somewhat erect, linear, linear-lanceolate, or oblanceolate, 1–3.5 × 0.1–0.7 cm, uniformly wide or base attenuate, decurrent on stem into a narrow or broad green wing, apex acute or acuminate, with short cusp; upper leaves acuminate, with long cusp, margin revolute; all leaves thickly arachnoid tomentose or cauliforous glandular pilose. Capitula 5–50, densely corymbiform or compound corymbiform; peduncle 2–2.5 mm. Involucre narrowly campanulate, 4–5 mm, rarely to 6 mm; phyllaries ca. 6-seriate, expanding; outer phyllaries brown, broadly ovate, ca. 1.5 mm, tomentose, slightly acute; middle ones lingulate-elliptic, 3–3.5 × ca. 1 mm, ca. 1.5 mm wide in male capitula, apex white, obtuse or rounded; innermost ones ca. 4 mm, with a ca. 3/4 of full length claw. Receptacle with fimbriate appendage. Predominantly female capitula with numerous marginal female florets, center with 1–4 male florets; predominantly male capitula with male florets only. Corolla tube ca. 3 mm. Pappus slightly exceeding corolla, incrassate at tip of apex in male florets, serrulate. Achenes oblong, ca. 1 mm, densely papillose. Fl. Jul–Aug, fr. Aug–Sep.

- Alpine or subalpine shrublands, slopes, rocky places, valleys, and banks; 2000–4000 m. NW and W Sichuan, NW Yunnan.

This species is extremely variable.

1a. Leaves linear, linear-oblancoelate, or lanceolate, 3–7 mm wide, base decurrent along stems to broad wing, margin undulate-recurved, adaxially with arachnoid and capitule glandular hairs ................................................................. 38c. var. ulophylla

1b. Leaves linear or linear-lanceolate, 1–3.5 mm wide, base decurrent along stems to narrow wing, margin recurved, adaxially arachnoid or lanate or with capitule-stalked glandular hairs.

2a. Leaves adaxially arachnoid or sparsely lanate .......................... 38a. var. gracilis

2b. Leaves adaxially with capitule-stalked glandular hairs ........... 38b. var. aspera

38a. **Anaphalis gracilis** var. gracilis

纤枝香青(原变种) xian zhi xiang qing (yuan bian zhong)

Stems 5–30 cm, white arachnoid lanate, upper parts white lanate. Leaves linear or linear-lanceolate, 1–2.5 cm × 1–3 mm, abaxially densely gray arachnoid lanate, adaxially arachnoid or sparsely lanate, margin recurved.

- Alpine dry slopes and rocky places; 3200–4000 m. NW and W Sichuan.


糙叶纤枝香青 cao ye xian zhi xiang qing

Stems ca. 40 cm, with capitule glandular hairs, upper parts also arachnoid hairy. Leaves usually linear or linear-lanceolate, 1.5–2.5 cm × 1–3.5 mm, abaxially white arachnoid hairy, adaxially green with capitule-stalked glandular hairs.

- Alpine or subalpine shrublands and slopes; 2600–3500 m. NW and W Sichuan (Barkam, Ganzi, Lixian).


皱缘纤枝香青 zhou yuan xian zhi xiang qing

Sobol long, runnerlike. Stems tall, with thickish branches, arachnoid and capitule glandular hairy. Leaves linear, linear-lanceolate, or lanceolate, 1.5–2.5 cm × 3–7 mm, abaxially white lanate, adaxially arachnoid and capitule glandular hairy, base attenuate and decurrent on stems to broad wing, margin undulate-recurved, apex acute or acuminate.

- Subalpine grassy slopes, valleys, and banks; 2000–3000 m. W Sichuan, NW Yunnan (Déqên).


乳白香青 ru bai xiang qing

Shrubs, much branched, erect or ascending, upper part with dense withered leaves, with terminal rosette of leaves and stems. Rhizome thickish. Stems erect, 10–40 cm, slightly thickish, simple, herbaceous, white or pallid tomentose, upper parts densely leafy. Rosette leaves lanceolate or spatulate-oblong, 6–13 × 0.5–2 cm, base attenuate into a winged, sheathlike petiole; lower leaves smaller than rosette leaves, margin flat, apex acute or acuminate, with or without short cusp; middle and upper leaves somewhat erect and adherent to stem, oblong, linear-lanceolate, or linear, 2–10 × 0.8–1.3 mm, base slightly narrow, decurrent on stem into a narrow wing, apex acuminate, with withered long cusp; all leaves white or pallid tomentose on both surfaces, 1- or 3-veined. Capitule numerous, densely composed corymbiform, at apex of stems or branches; peduncle 2–4 mm. Involucre campanulate, (5–)6(–7) × 5–7 mm; phyllaries 4- or 5-seriate; outer phyllaries light or dark brown, ovate, ca. 3 mm, tomentose; middle ones milky white, ovate-oblong, ca. 6 × 2–2.5 mm, apex rounded; innermost ones narrowly oblong, ca. 5 mm, with a ca. 2/3 of full length claw. Receptacle with fimbriate short hairs. Predominantly female capitula with numerous marginal female florets, center with 2 or 3 male florets; predominantly male capitula with male florets only. Corolla tube 3–4 mm. Pappus slightly exceeding corolla, incrassate at tip of apex in male florets, serrulate. Achenes terete, ca. 1 mm, almost glabrous. Fl. and fr. Jun–Sep.

- Subalpine or low mountain grasslands or taiga; 2000–3400 m. S Gansu, E Qinghai (Datong, Menyuan, Qilian), NW Sichuan (Songpan).


巴塘香青 ba tang xiang qing
Rhizome thickish, with slender withered leaves, numerous erect branches or sterile stems congested to pulvinate. Sterile stems with dense squamate leaves and fertile axillary buds; cauline leaves obovate, 0.5–1.5 × 0.2–0.4 mm, cinereous tomentose, rounded at apex, sometimes with gland-dotted short cusp. Flowering stems on fertile stems, 5–30 cm, slender, cinereous to yellowish white tomentose, densely leafy; basal leaves obovate or spatulate-oblong, 1.5–4 × 0.3–0.5 mm, base attenuate to a long petiole; middle leaves erect or slightly expanding, spatulate or lanceolate-oblong, uniformly wide or slightly narrow at base, decurrent on stems into a short wing; upper leaves lanceolate or linear, apex acute, with long chaffy cusp; all leaves pallid arachnoid tomentose, 3-veined, midvein convex abaxially, tomentose. Capitula 5–10, densely corymbiform; peduncle 1–2 mm. Involucrally campanulate, 7–8 × 5–6 mm; phyllaries ca. 5-seriate, expanding; outer phyllaries upper parts mauve, lower parts brown, ovate or elliptic, 3–5 mm, tomentose; middle and upper parts mauve or white, yellowish white when dry, oblong-lanceolate, ca. 7 × 1.5–2 mm, acute at apex; innermost ones linear-oblongate, ca. 5 mm, with a ca. 3/5 of full length claw. Receptacle with fimbriolate appendage. Predominantly female capitula with numerous marginal female florets, center of 1 or 2 male florets; predominantly male capitula with male florets only. Corolla tube ca. 4 mm. Pappus slightly exceeding corolla, incassate at tip of apex in male florets, serrulate. Achenes oblong, ca. 1 mm, densely glandular. Fl. Jul–Aug, fr. Sep. 2n = 56*

- Alpine grasslands, open slopes, rock fissures; 3800–4200 m. SW Sichuan (Chawalong, Muli), E Xizang (Zayü, Zogang), N Yunnan (Gongshan, Weixi, Zhongdian).


四川香青 *si chuan xiangqing*

Rhizome thickish, contorted, with upper leaves dense, withered terminal rosette leaves, and flowering stems. Stems erect or ascending, ca. 20 cm, herbaceous, slender, white-crenate arachnoid tomentose, densely leafy. Lower leaves homomorphic with rosette leaves, smaller, withered or persistent in efflorescence; middle and upper leaves somewhat expanding, or erect and adherent to stem, oblongate-oblong or linear, 20–40 × 3–5 mm, abruptly narrow at base, apex acuminate, with withered long cusp; all leaves tomentose on both surfaces, sometimes with capitulate glandular hairs, lower parts convoluted; middle leaves lanceolate, uniformly wide or slightly narrow at base, decurrent on stem into a short wing; upper leaves lanceolate or linear, apex acute, with long chaffy cusp; all leaves white-canescent tomentose on both surfaces, sometimes lower leaves glabrous to reveal capitate glandular hairs, indistinctly 1- or 3-veined. Capitula 8–15, densely corymbiform or compound corymbiform. Involucre narrowly campanulate, 5 × 4–5 mm; phyllaries 5- or 6-seriate; outer phyllaries light brown, ovate, ca. 2.5 mm, abaxially tormentose; middle ones white, oblong-elliptic, ca. 3 × 1.5 mm, apex obtuse, but subrounded in male florets; innermost ones spatulate-oblong, ca. 3.5 mm, with a ca. 2/3 of full length claw. Receptacle with fimbriolate appendage. Predominantly female capitula with numerous marginal female florets, center with 5 male florets; predominantly male capitula with male florets only. Corolla tube 2.5–3.5 mm. Pappus exceeding corolla, incassate at tip of apex in male florets, serrulate. Achenes oblong, ca. 1 mm, densely glandular. Fl. Jul–Aug, fr. Sep. 2n = 56*

- Alpine or subalpine ridges, grasslands, and forests; 3000–4200 m. W Sichuan.

- Alpine rocky grassy slopes and calcareous ground; 3500–4500 m. W Sichuan (Kangding, Lixian, Taining).

No specimens of this species were seen by the second author.


木根香青 木根香青

Rhizome thickish, with numerous branches; upper leaves squamate, withered terminal rosette leaves and flowering stems congested to pulvinate. Stems erect or ascending, 3–7 cm, slender, herbaceous, simple, white-canescent arachnoid tomentose, densely leafy. Rosette leaves and lower leaves spatulate, oblong, or linear-spatulate, 0.5–3 × 0.3–0.7 cm, base attenuate to a broadly winged long petiole, margin flat, apex rounded; upper leaves gradually smaller, erect or adherent to stem, oblongate or oblong-oblong, base decurrent on stem into a short narrow wing, apex obtuse with short cusp or acuminate with withered long cusp; all leaves sparsely canescent tapecomentose on both surfaces, basal and upper parts except margin usually denuded or with capitulate glandular hairs, distinctly 3-veined, midvein raised on both surfaces, lateral veins raised abaxially, or upper leaves 1-veined. Capitula 5–10, densely compound corymbiform; peduncle short. Involucre broadly campanulate or obconical, 5–6 × ca. 6 mm; phyllaries 5-seriate, expanding; outer phyllaries ovate, ca. 3 mm, tomentose; middle ones oblong-lanceolate, ca. 2 mm, lower parts purplish or purple-brown, at apex, in female florets slightly obtuse; innermost ones linear-oblong, ca. 4 mm, with a claw ca. 3/4 of full length. Receptacle with chaffy hairs. Predominantly female capitula with numerous marginal female florets, center with 3 or 4 male florets; predominantly male capitula with male florets only. Corolla tube ca. 3.5 mm. Pappus exceeding corolla, incrassate at tip of apex in male florets, serrulate. Achenes obovoid-oblong, ca. 1.5 mm, tomentose. Fl. Jun–Sep, fr. Aug–Oct. 2n = 28*.

Alpine grasslands and lichen-covered areas; 3800–4000 m. S Xizang [Bhunt, N India, Nepal].


茬衣香青 茬衣香青

Rhizome thickish, much branched; upper leaves squamate, withered terminal rosette leaves and flowering stems congested to pulvinate. Stems erect or ascending, 3–25 cm (from protologue up to 40 cm), white-canescent glutinous cottony papery tomentose, all stems densely leafy. Basal leaves persistent in efflorescence, homomorphic with rosette leaves, obovate, oblong, or oblong-spatulate, 0.5–2.5 × 0.3–0.5 cm, canescent tomentose; middle leaves erect or adherent to stem, linear-lanceolate, 1.5–2.5 × 0.3–0.5 cm, base attenuate on stem into a narrow wing, margin flat, apex acute, often with membranous long cusp; upper leaves small, linear, same as middle leaves with grayish twined papery tomentose hairs. Capitula 7–20, densely compound corymbiform; peduncle ca. 2 mm. Involucre broadly campanulate, ca. 10 × 8–10 mm; phyllaries 4- or 5-seriate, somewhat expanding; outer phyllaries fulvous except apex, ovate, tomentose; middle ones ochroleucous, oblanceolate, ca. 9 × 2 mm, acute at apex; innermost ones short, narrow, ca. 5 mm, with a claw ca. 2/3 of full length. Receptacle with fimbriolate hairs. Predominantly female capitula with numerous marginal female florets, center with 2–4 male florets; predominantly male capitula with male florets only. Corolla tube ca. 3.5 mm. Pappus white, ca. 4 mm, incrassate at tip of apex in male florets, serrulate. Achenes oblong, ca. 1.2 mm, densely papillose. Fl. Jul.–Aug, fr. Sep.

- Subalpine meadows, taiga, copses or calcareous ground; 2700–3700 m. NW Yunnan (Lijiang).


污毛香青 歇毛香青

Rhizome slightly thickish, much branched; upper leaves dense, withered, with terminal rosette leaves and flowering stems. Stems erect or ascending, up to 20 cm, slightly thickish, herbaceous, fulvous tomentose, with slightly dense or sparse leaves. Lower leaves persistent in efflorescence, homomorphic with rosette leaves, obovate or oblanceolate, 1.5–4 × 0.5–1 cm, base attenuate to a brown, glabrous, broad sheath, apex rounded or obtuse; middle and upper leaves erect, adherent to stems, spatulate-oblong or narrowly oblong, 2–4 × 0.3–0.7–1 cm, base decurrent on stem into an indistinct short wing, margin flat, apex obtuse or rounded, with short black cusp; upper leaves acuminate, with withered long cusp; all leaves fulvous brown tomentose on both surfaces, indistinctly 3-veined. Capitula 7–10, densely glomerulate. Involucre broadly campanulate, ca. 10 × 10 mm; phyllaries ca. 5-seriate, expanding; outer phyllaries brown, oval-lanceolate, ca. 4 mm, brown tomentose; middle ones obovate or oblanceolate, 9–10 × 2.5–3.5 mm, acute at apex, but obtuse in male capitula, upper parts yellowish white; innermost ones linear-lanceolate, ca. 5 mm, with a claw ca. 3/5 of full length. Receptacle with chaffy process. Predominantly female capitula with numerous marginal female florets, center with 3–6 male florets; predominantly male capitula with numerous male florets, Corolla tube ca. 5 mm. Pappus 6–7 mm, incrassate at tip of apex in male florets, serrulate. Achenes oblong, ca. 2 mm, densely papillose. Fl. Jul.–Aug, fr. Sep.

- Alpine dry rocky slopes; 3800–4300 m. NE, NW, and W Yunnan.


灰毛香青 灰毛香青

Rhizome usually thickish, woody, much branched, upper part with dense squamate withered leaves, rosulate and flowering stems congested to pulvinate. Stems erect or ascending, 2–3–8 cm (or plants acaulescent), herbaceous, slender. Basal leaves homomorphic with rosette leaves, obovate or spatulate, obtuse, rounded, or acute at apex, usually with gland-dotted short cusp; lower leaves oblanceolate-oblong, base attenuate, decurrent on stem into short wing, margin smooth, apex acute or obtuse; upper leaves rather narrow, erect or adherent to stem,
or foliate on stem; all leaves thin, both surfaces argentaceous tomentose, denuded at base, indistinctly 3-veined. Capitula 5–10, densely corymbiform, or solitary. Involucre broadly campanulate, 9–10 × 10(–15) mm; phyllaries ca. 5-seriate, expanding, white, rarely yellowish white, puce at base; outer phyllaries elliptic-lanceolate, ca. 5 mm, sparsely tomentose at base; middle ones oblong-lanceolate, ca. 9 × 2.5 mm, acute at apex; innermost ones broadly oblong or spatulate-linear, ca. 5 mm, with a claw ca. 1/2 of full length; phyllaries of male capitula slightly obtuse. Receptacle with fimbriate hairs. Predominantly female capitula with numerous marginal female florets, center with 2–5 male florets; predominantly male capitula with male florets only. Corolla tube 3.5–4 mm. Pappus slightly exceeding corolla, incrassate at tip of apex in male florets, serrulate. Achenes oblong, ca. 1 mm, glabrous. Fl. Jul–Sep.

- Alpine slopes and rocks; 4300–4400 m. S Sichuan, NW Yunnan.

  No specimens of this species were seen by the second author.

1a. Plants caulescent; capitula 5–10, densely corymbiform, with short peduncle ......................... 47a. var. cinerascens  
1b. Plants acaulescent; capitulum single, without peduncle ........................................ 47b. var. congesta

47a. Anaphalis cinerascens var. cinerascens

灰香青(原变种) hui mao xiang qing (yuan bian zhong)

Stems erect or ascending, 3–6 cm, with dense leaf rosettes 1.5–3 cm in diam.; internodes 0.5–1 cm. Rosette leaves obovate-oblong or spatulate, 5–15 × 3–5 mm; lower leaves oblan-céolate-oblong, 1–1.5 cm × 2–3 mm, base sometimes glabrous, attenuate, decurrent into short wing along stems, margin flat, apex obtuse or acute; upper leaves narrow, erect or adnate to stems, acuminate. Capitula 5–10, congested to corymb; peduncle short, lanate. Involucre ca. 10 mm in diam.

- Alpine slopes and rocks; ca. 4000 m. SW Sichuan (Mianming), NW Yunnan (Zhongdian).

47b. Anaphalis cinerascens var. congesta

密聚灰香青 mi ju hui mao xiang qing

Plants acaulescent or stems only ca. 2 mm; rosette and basal leaves congested to globose, 8–12 mm in diam. Leaves more layered, densely imbricate, lower layers (subterranean leaves) flat, rounded, gradually withered, upper layers (rosette and basal leaves) obovate or broadly spatulate, ca. 5 mm, rarely ca. 7 mm, membranous, brown, upper parts gray lanate, base glabrous, apex obtuse or rounded. Capitulum usually solitary, without peduncle. Involucre 12–15 mm in diam. Achene obovoid-oblong, ca. 1 mm.

- Alpine sunny slopes, rocky peaks; 4300–4400 m. S Sichuan (Mianming).

48. Anaphalis viridis


绿香青 lü xiang qing

Stems and leaves densely caespitose, pulvinate. Stems erect or ascending, 4–8 cm (or plants acaulescent), herbaceous, slender, canescent tomentose, densely leafy, or upper part sparse. Basal leaves persistent during efflorescence, homomorphic with rosette leaves, obovate, oblan-céolate, or spatulate-elliptic, 0.3–2 × 0.3–0.7 cm, apex acute; middle and upper leaves (if present) erect or adherent to stem, lanceolate or oblan-céolate-oblong, rather acerate, base decurrent on stem into a short cuneate wing, margin smooth, apex acute or acuminate, often with withered cusp; all leaves keeled on both surfaces, canescent yellow tomentose, base sometimes glabrous, 1-veined or indistinctly 3-veined. Capitula 2–15, glomerulate or simple, without distinct peduncle. Involucre broadly campanulate, 9–11 × 10–12 mm, slightly exceeding disk; phyllaries 4- or 5-seriate, somewhat expanding; outer phyllaries brown, elliptic, ca. 4 mm, tomentose; middle ones white, upper parts white or ochroleucous, oblong-lanceolate, 9–10 × 2–3 mm, acute at apex; innermost ones linear-oblan-céolate, ca. 8 mm, with a claw ca. 2/3 of full length. Receptacle with chaffy process. Capitula with numerous marginal female florets, center of predominantly female capitula with 1–5 male florets. Corolla tube 4–5 mm. Pappus equaling corolla. Achenes obovoid-oblong, ca. 2 mm, densely papillose. Fl. Jul–Aug, fr. Aug–Sep.

- Mountaintops, on granite of alpine glacial valleys, rocky or grassy slopes; 3000–4800 m. W Sichuan, E Xizang, NW Yunnan.

  No specimens of this species were seen by the second author.

1a. Stems 4–8 cm; capitula 5–15, congested into globose corymb at stem apex, 2–3 cm in diam. ................................................. 48a. var. viridis  
1b. Plants acaulescent or stems up to 4 mm; capitula solitary or 2- or 3-fasciate on rosette leaves ........................................ 48b. var. acaulis

48a. Anaphalis viridis var. viridis

绿香青(原变种) lü xiang qing (yuan bian zhong)

Stems 4–8 cm tall; lower leaves dense; internodes 0.2–0.5 cm, while upper internodes to 1 cm. Leaves lanceolate or oblan-céolate-oblong, 1.5–3.5 × 1.5–3.5 cm. Capitula 5–15, densely congested into globose corymb at stem apex, 2–3 cm in diam.

- Mountaintops, rocky or grassy slopes; 3000–4800 m. E Xizang (Cawarong, Qamdo), NW Yunnan (Lijiang).

48b. Anaphalis viridis var. acaulis


无茎绿香青 wu jing lü xiang qing

Plants acaulescent or stems up to 4 mm. Leaves spatulate-elliptic, 0.7–1.5 × 0.3–0.5 cm. Capitula solitary or 2- or 3-fasciate on rosette leaves.

- On granite of alpine glacial valleys; 3600–4800 m. W Sichuan (Dawu, Kangding, Muli).

49. Anaphalis flavescencs


淡黄香青 dan huang xiang qing
Rhizome slightly slender; runners acerose, membranous squamate leafy, with terminal rosette leaves. Stems erect or ascending from geniculate base, 10–22 cm, slender, canescent arachnoid tomentose, rarely thickly white tomentose, lower leaves dense. Rosette leaves oblong-elliptical, 1.5–5 × 0.5–1 cm, lower part attenuate to a long petiole, apex acute or obtuse; basal leaves withered in efflorescence; lower and middle leaves oblong-lanceolate or lanceolate, 2.5–5 × 0.5–0.8 cm, erect or adherent to stem, base decurrent on stem into narrow wing, margin flat, apex acute, with withered brown cusp; upper leaves small, narrowly lanceolate, 1–1.5 cm; all leaves canescent or yellowish white arachnoid tomentose or white tomentose, somewhat distinctly 3-veined. Capitula 6–16, densely corymbiform or compoundly so; peduncle 3–5 mm. involucre broadly campanulate, 8–10 × ca. 10 mm; phyllaries 4- or 5-seriate, somewhat expanding; outer phyllaries fulvous, elliptic, ca. 6 mm, tomentose at base; middle ones white, lanceolate, ca. 10 × 3–4 mm, acute at apex; innermost ones linear, 6–8 mm, with a claw 1/3–1/2 of full length. Receptacle with filiform hairs. Predominantly female capitula with numerous marginal female florets, center with 3–12 male florets; predominantly male capitula with 10–25 male florets. Corolla exceeding pappus; corolla tube 4.5–5.5 mm. Pappus incrassate at tip of apex in male florets, serrulate. Achenes oblong, 1.5–1.8 mm, densely papillose. Fl. Aug–Sep, fr. Sep–Oct.

- Gansu, Qinghai, Shaanxi, W Sichuan, E and S Xizang.

1a. Stems and leaves gray or yellowish white arachnoid tomentose; rosette and lower leaves oblanceolate-oblong or oblong, 2.5–5 × 0.5–1 cm .................. 49a. var. flavescens

1b. Stems and leaves densely white or gray lanate; rosette and lower leaves spatulate-oblong, 1.5–2.5 × 0.5–0.7 cm .... 49b. var. lanata

49a. Anaphalis flavescens var. flavescens

淡黄香青 (原变种) dan huang xiang qing (yuán biàn zhòng)

Anaphalis flavescens f. rosea Y. Ling; A. flavescens f. sulphurea Y. Ling.

Stems and leaves gray or yellowish white arachnoid tomentose. Rosette and lower leaves oblanceolate-oblong or oblong, 2.5–5 × 0.5–1 cm.

- Alpine or subalpine slopes, grasslands, forests; 2800–4700 m. S and W Gansu, E Qinghai, S Shaanxi, W Sichuan, E Xizang.

This taxon is extremely variable. The phyllaries can be buff with a fulvous base, yellow with a black-brown base, or pale red with a puce base.


棉毛淡黄香青 mian mao dan huang xiang qing

Stems and leaves densely white or gray lanate. Rosette and lower leaves spatulate-oblong, 1.5–2.5 × 0.5–0.7 cm. Involucre 8–10 mm; phyllaries buff.

- W Sichuan.

with 3–6 male florets; predominantly male capitula with male florets only, or 1–3 female florets outside. Corolla of male florets ca. 3 mm, ca. 4 mm in female florets. Pappus ca. 4 mm, incassate at tip of apex in male florets, serrulate. Achenes terete, ca. 1 mm, hirsutulous. Fl. Jun–Sep, fr. Aug–Oct.

Alpine or subalpine grasslands, conifer forests, forest margins, scrub, valleys, riverbanks, river sands, rocks, rock crevices, among lichens on slopes; 2400–4500 m. Gansu, Shaanxi, Sichuan, Xizang, Yunnan [Bhutan, India, ?Myanmar, Nepal].

1a. Plants acaulescent, or stems low, up to 6 cm tall, rarely taller, with leaves densely clustered; capitulum solitary, among rosette leaves or at stem apex ........  51c. var. monocephala

1b. Stems 5–45 cm tall; capitula few or numerous, arranged in sparse corymb, rarely solitary.

2a. Stem thickish, 30–45 cm tall; capitula 1–6 or more; peduncle 0.5–1 cm long; base sessile, ca. 6 cm tall, rarely taller, with leaves densely clustered; capitulum solitary, among rosette leaves or at stem apex; middle leaves small, rarely cauliforeous, elliptic, 3-veined. Cauline leaves oblong or elliptic, 0.5–1 cm long.[1]

2b. Stem slender, 5–30 cm tall; capitula 1–6; lower leaves usually surviving during anthesis ........................................ 51a. var. nepalensis

51a. Anaphalis nepalensis var. nepalensis

51b. Anaphalis nepalensis var. corymbosa

51c. Anaphalis nepalensis var. monocephala

- Alpine or subalpine grasslands, scrub, conifer forests, river sands; 2500–4100 m. W Sichuan, NW and W Yunnan [Bhutan, Myanmar, Nepal].

This taxon is recorded in Annot. Checkl. Fl. Pl. Nepal (50. 2000, as A. corymbosa) from Bhutan, Myanmar, and Nepal. However, it is not mentioned in Fl. Bhutan (23): 1515–1522. 2001.

51c. Anaphalis nepalensis var. monocephala

52. Anaphalis triplinervis (Sims) C. B. Clarke, Compos. Ind. 105. 1876.

三脉香青 san mai xiang qing

- Alpine or subalpine grasslands, scrub, conifer forests, river sands; 2500–4100 m. W Sichuan (Xiangning), S Xizang, NW Yunnan [Bhutan, India, Nepal].

35. Anaphalis nepalensis var. corymbosa

36. Anaphalis nepalensis var. monocephala

53. Anaphalis nagasawae Hayata, Bot. Mag. (Tokyo) 20: 15. 1906 ["nagasawai"].

永健香青 yong jian xiang qing

- Alpine or subalpine grasslands, scrub, conifer forests, river sands; 2500–4100 m. W Sichuan, NW and W Yunnan [Bhutan, Myanmar, Nepal].

This taxon is recorded in Annot. Checkl. Fl. Pl. Nepal (50. 2000, as A. corymbosa) from Bhutan, Myanmar, and Nepal. However, it is not mentioned in Fl. Bhutan (23): 1515–1522. 2001.
on stem into a narrow wing, margin flat, apex obtuse, without distinct short cusp; upper leaves slightly short; all leaves pallid tomentose on both surfaces. Involute subspHERIAL, ca. 1 × 1–1.5 cm, red-brown, thinly tomentose at base; middle phyllaries white or ochroleucous, elliptic-lanceolate, 7–8 × ca. 3 mm, apex acute; innermost linear-lanceolate, ca. 7 mm, with a claw ca. 1/2 of full length. Receptacle lacunose, glabrous. Capitula with numerous marginal female florets, center of predominantly female capitula with few to 15 female florets present. Corolla of female florets ca. 4 mm, rather short; male florets unknown. AcheneS TERETE, ca. 1 mm. Fl. Jul–Aug.

- Alpine dry grasslands. Taiwan.


尖叶香青  jian ye xiang qing

Rhizome thick, creeping, with marcescent leaves. Stems erect, 12–23 cm, slender, 1–1.5 mm in diam., becoming slightly woody at base, white arachnoid tomentose, sometimes glabrate in lower parts; leaves at base persistent, short, membranous, broadly ovate or orbicular, brown squamiform leaves arising from base, internode 3–10 mm. Capitula 6, corymiform, pedunculate. Involucre campanulate-globose, ca. 6 × 6 mm, base rounded, densely lanate; phyllaries imbricate, 6-seriate; outer phyllaries red-brown, ovate-lanceolate, apex acuminate or obtuse; inner ones white, apex obtuse. Capitula with many marginal female florets, center of predominantly female capitula with 5–14 female florets, mostly linear-lanceolate, ca. 7 mm, base brownish, apex acute; middle ones white, elliptic-lanceolate, 5–7 × ca. 2 mm, claw deep brown, apex acute or acuminate; innermost ones linear-lanceolate, with a claw ca. 1/2 of full length. Receptacle without fimbriate appendage. Capitula with numerous marginal female florets, center of predominantly female capitula with 5–14 male florets. Corolla 3–3.5 mm. Pappus white, filiform-dentate.

Ovary ca. 0.5 mm, pubescent. Fl. Jul–Sep.

- Gravel slopes, gritty regions; ca. 3900 m. S Xizang (Yadong).

No specimens of this species were seen by the second author.

Species incertae sedis


大山香青  da shan xiang qing

Stems unbranched, erect, ca. 10 cm, densely tomentose, base ca. 1 mm in diam., foliaceous, apices ascending corymbose branched. Basal leaves rosulate, small, obovate, withered by anthesis, both surfaces gray tomentose; middle leaves spatulate, 12–14 × 3–3.5 mm, both surfaces densely tomentose, base attenuate, almost sheathlike, apex obtuse; upper leaves linear, 5–6 mm. Capitula 6, corymbose, pedunculate. Involute campanulate-globose, ca. 6 × 6 mm, base rounded, densely lanate; phyllaries imbricate, 6-seriate; outer phyllaries red-brown, ovate-lanceolate, apex acuminate or obtuse; inner ones white, apex obtuse. Capitula with many marginal female florets, center of predominantly female capitula with 5–14 female florets, mostly linear-lanceolate, ca. 7 mm, base brownish, apex acute; middle ones white, elliptic-lanceolate, 5–7 × ca. 2 mm, claw deep brown, apex acute or acuminate; innermost ones linear-lanceolate, with a claw ca. 1/2 of full length. Receptacle without fimbriate appendage. Capitula with numerous marginal female florets, center of predominantly female capitula with 5–14 male florets. Corolla 3–3.5 mm. Pappus white, filiform-dentate.

Ovary ca. 0.5 mm, pubescent. Fl. Jul–Sep.

- Alpine grasslands. Taiwan.

Specimens of this species were not seen by the present authors. The above description is based on the original literature.


拟鼠麴草属  ni shu qu cao shu

Chen Yousheng (陈又生); Randall J. Bayer

Gnaphalium subg. Laphangium Hilliard & B. L. Burtt; Laphangium (Hilliard & B. L. Burtt) Tzvelev.

Herbs, perennial, biennial, or annual. Leaves alternate, flat with entire margins, tomentose on both surfaces. Capitula many in corymbS. Phyllaries papery, whitish, rosy, tawny, or brownish, opaque or hyaline, dull or shiny; stereome divided. Receptacle flat, epaleate. Outer florets yellow, filiform. Central florets bisexual, yellow. Anthers with flat appendages. Style branches truncate, with hairs apically. Achenes oblong, with short clavate twin hairs. Pappus bristles capillary, barbellate, and free.

About 90 species: worldwide, mostly South America to North America, mostly in temperate regions; six species (two endemic) in China.

1a. Phyllaries light white or bright brown.

2a. Robust herbs, up to 1 m tall; leaves distinctly 3-veined

2b. Dwarf herbs, 10–40 cm tall; leaves 1-veined.

3a. Annual herbs; leaves spatulate or spatulate-oblong, apex obtusely rounded, base narrower

3b. Perennial herbs; leaves lanceolate or ovate-lanceolate, rarely linear, apex shortly acute, base broader

1b. Phyllaries golden yellow or citrine yellow.

4a. Stems shortly glandular; leaf base decurrent to form wings; capitula ca. 5 mm in diam. or larger

4b. Stems unbranched, erect; leaves 1-3 mm in diam.
1. Pseudognaphalium adnatum (Candolle) Y. S. Chen, comb. nov.

宽叶拟鼠麴草 kuan ye ni shu qu cao


Herbs, robust. Stems erect, 4–8 mm in diam., 50–100 cm tall, unbranched or rarely branched below, corymbose branched above, densely lanate. Basal leaves withering at anthesis; middle and lower leaves oblong to subelliptic, 4–9 × 1–2 cm, leathery, both surfaces densely tomentose, midrib elevated, base decurrent, apex obtuse. Capitula 5–7 mm in diam., in coryms on upper stem. Involucre yellow or white, 3- or 4-seriate, globose, 5–6 mm wide, scariosus; outer phyllaries obvolute or oblateceolate, ca. 4 mm, rounded; inner ones elliptic or oblong, ca. 4 mm. Outer florets many; corolla ca. 3 mm. Central florets 5–7, ca. 3 mm. Achenes oblong, ca. 0.5 mm. Pappus white, ca. 3 mm. Fl. Aug–Oct.

Mountain slopes, roadsides, exposed rocky environments; 500–3000 m. Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Jiangsu, Shaanxi, Shandong, Sichuan, Taiwan [Afghanistan, Indonesia, Laos, Pakistan, N Thailand, Vietnam; Africa, SW Asia (Iran), Australia, Europe, North America].


丝棉草 si mian cao


Herbs, annual, 15–40 cm, taprooted or fibrous-rooted. Stems white lanate, not glandular. Leaves crowded; internodes 1–5, sometimes to 10 mm; blade narrowly obovate to subobovate, 1–3(–6) cm × 2–8 mm (distal smaller, oblongceolate to narrowly oblong or linear), both surfaces mostly concolorous to weakly bicolored, abaxially gray tomentose, adaxially usually gray tomentose, sometimes glabrescent, neither surface glandular, bases subclasping, usually decurrent 1–2 mm, margin weakly revolute. Capitula in terminal glomerules 1–2 cm in diam. Involucre broadly campanulate, 3–4 mm; phyllaries 3- or 4-seriate, silvery gray to yellowish, hyaline, ovate to ovate-oblong, glabrous. Female florets 135–160. Bisexual florets 5–10; corollas red tipped. Achenes not evidently ridged, conspicuously dotted with whitish, papilliform hairs. Pappus bristles loosely coherent basally, released in clusters or easily fragmented rings. 2n = 14, 28.

Exposed fields, roadsides; below 3200 m. Gansu, Hainan, Henan, Hubei, Jiangsu, Shaanxi, Shandong, Sichuan, Taiwan [Afghanistan, India, Laos, Pakistan, N Thailand, Vietnam; Africa, SW Asia (Iran), Australia, Europe, North America].

4b. Stems white lanate; leaf base decurrent, sometimes slightly amplexicaul; capitula 2–4 mm in diam.

5a. Dwarf herbs, 10–40 cm tall, usually branched from base; leaves spatulate or spatulate-oblanceolate, not amplexicaul or auriculate, whitish tomentose on both surfaces; pappus connate at base ...................... 5. P. affine

5b. Robust herbs, up to 80 cm tall, only branched in upper part; leaves linear, subamplexicaul-auriculate, green glandular adaxially, white tomentose abaxially; pappus distinct ........................................... 6. P. hypoleucum


拉萨拟鼠麴草 la sa ni shu qu cao


Herbs, perennial, somewhat woody at base. Stems in tufts, 1–1.2 mm thick, branched from middle and in upper part, 14–16 cm tall, arachnoid tomentose. Basal leaves withering at anthesis, linear, 10–12 × ca. 1.5 mm; middle leaves lanceolate or ovate-lanceolate, 15–18 × 3–2 mm, abaxially white lanate, adaxially green and arachnoid pubescent, base amplexicaul, apex mucronate; upper leaves ovate or ovate-oblong, 10–15 × 3–5 mm, base broader, apex mucronate. Capitula numerous, 4–5 mm in diam., pedunculate, in terminal compound corymbs. Involucre campanulate, 4–5 mm in diam.; phyllaries 4- or 5-seriate, niitid, grayish white or light yellow; outer ones ovate, 2–2.5 mm, abaxially densely lanate, apex obtuse; middle ones oblong or obovate-oblong, 3–4 mm, apex rounded or toothed; innermost ones obovate-oblong, 4.5–5.5 mm, abaxially glabrous. Receptacle slightly convex, glabrous. Outer florets female; corolla filiform, 2.5–3 mm, limbs usually 4-toothed, rarely 3- or 5-toothed. Disk corolla 5-toothed. Achenes oblong or elliptic, ca. 1 mm, papillose. Pappus white, ca. 3.5 mm, sebrad. Fl. Aug–Nov.

● Alpine grasslands, thickets; 3000–3800 m. Xizang.


金头拟鼠麴草 jin tou ni shu qu cao

Gnaphalium chrysocephalum Franchet, J. Bot. (Morot) 10: 412. 1896, not Schultz Bipontinus (1845).

Herbs, perennial, erect. Stem usually simple, 60–80 cm tall, shortly pubescent, upper part lanate. Leaves narrowly lanceolate or linear-lanceolate, 5–8 × 5–8 cm, abaxially scabrid, adaxially gray lanate, base half decurrent and narrowly cuneate, apex acute. Capitula densely corymbose, campanulate, ca. 6 mm in diam. Outer phyllaries lanceolate; middle ones golden yellow and polished, obovate-oblong, apex rounded; innermost ones pale, spatulate, base leathery, apex membranaceous. Florets bisexual. Achenes columnar to subellipsoid, glabrous. Pappus white, ca. 4 mm, deciduous. Fl. Jun–Oct.

● Grassy slopes; 2600–2800 m. W Sichuan, Yunnan.


拟鼠麴草 ni shu qu cao

Gnaphalium affine D. Don, Prodr. Fl. Nepal. 173. 1825; G. confusum Candolle; G javanum Candolle; G. luteoalbum Linnaeus subsp. affine (D. Don) J. Koster; G. hypoleucum var. multiceps (Wallich ex Candolle) J. D. Hooker; G. multiceps Wallich

● Alpine grasslands, thickets; 3000–3800 m. Xizang.

Herbs, biennial. Stems 15–40 cm tall, densely white lanate tomentose. Leaves thin; lower leaves smaller than median cauline leaves; cauline leaves spathulate, 2–6 × 4–12 cm, white lanate on both surfaces, base angular, narrowed, sessile, decurrent, margin entire, apex rounded, mucronulate. Capitula numerous, densely aggregated in terminal corymbs. Involucre globose-campanulate, ca. 3 × 3.5 mm; phyllaries 3-seriate, pale yellow, outer ones shorter, broadly ovate, inner ones oblong, apex obtuse. Outer florets many, ca. 1.75 mm. Central florets 5–10; corolla ca. 2 mm. Achenes oblong, compressed, ca. 0.5 mm, papillose. Pappus white, ca. 2 mm, bristles deciduous separately. 2n = 14.

A weed of wastelands and cultivated fields, common; sea level to 2000 m. Anhui, Fujian, Guangdong, Guangxi, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Afghanistan, Bhutan, India, Indonesia, Japan, Korea, Myanmar, Nepal, Pakistan, Philippines, Vietnam; SW Asia (Iran), Australia].

Six species: Australia; one species (introduced) in China.


Herbs, annual or biennial. Stems 20–120 cm tall. Leaves linear, 1.5–7.5 × 0.1–0.7 cm, bicolored, white tomentose abaxially. Phyllaries imbricate, nitid, white, red, yellow, pink, or purple. Florets few to many seriate, entire to crispate or revolute, subamplexicaul, usually undulate. Capitula in dense corymbose clusters, densely lanate, 3–3.5 mm in diam. Phyllaries 4- or 5-seriate, yellow to snow white, oblong, ca. 4 mm, apex acute rarely subacute. Outer florets filiform; corolla yellow, ca. 2 mm, 3- or 4-toothed. Disk florets ca. 2 mm; corolla 5-lobed. Achenes papillose, ca. 0.5 mm. Pappus setae white, free, minutely bristly, equaling corolla. Fl. Apr–Oct. 2n = 14.

A weed of wastelands, roadsides; below 2700 m. Anhui, Fujian, Guangdong, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, India, Indonesia, Japan, Korea, Myanmar, Nepal, Pakistan, Philippines, Thailand, Vietnam; SW Asia (Iran)].

This species is easily distinguished by its robust habit and subamplexicaul leaves, which are dull green adaxially and white tomentose abaxially.


蜡菊属 la ju shu
Chen Yousheng (陈又生); Randall J. Bayer

Herbs, perennial, sometimes biennial or annual. Stems with fibers in phloem, without resin canals, without pericyclic cambium. Leaves alternate, sessile, glandular hairy, margin generally flat, entire. Capitula heterogamous, disciform, few to solitary. Phyllaries few to many seriate, entire, papery, monomorphic, monochromous; lamina yellow, pink, orange, red, or white, opaque; stereome undivided. Receptacle flat, epaleate. Female florets yellow, filiform; corolla yellow, ca. 2 mm; corolla 5-toothed. Disk florets ca. 2 mm; corolla 5-lobed. Achenes papillose, ca. 0.5 mm. Pappus setae white, free, minutely bristly, equaling corolla. Fl. Apr–Oct. 2n = 14.

Six species: Australia; one species (introduced) in China.


蜡菊 la ju

Xeranthemum bracteatum Ventenat, Jard. Malmaison, t. 2. 1803; Bracteantha bracteata (Ventenat) Anderberg & Haegi; Helichrysum bracteatum (Ventenat) Haworth.


Widely cultivated in China as an ornamental plant [native to Australia].


拟蜡菊属 ni la ju shu
Chen Yousheng (陈又生); Randall J. Bayer

Herbs, perennial or annual, sometimes shrublets. Leaves alternate, generally flat with entire margins, often tomentose. Capitula solitary or many in corymbs. Phyllary papery, brown, yellow, pink, or white; stereome divided or undivided. Receptacle flat,
epaleate or rarely paleaceous. Outer filiform florets yellow, or absent. Central florets bisexual, yellow. Anthers with flat appendages. Style branches truncate, with hairs apically. Achenes oblong, glabrous or with elongated or short clavate twin hairs. Pappus bristles capillary, barbellate or subplumose, connate or free.

About 600 species: Africa, Asia, Europe, Madagascar; three species (one endemic) in China.

1a. Phyllaries white ...................................................................................................................................................... 1. *H. kashgaricum*

1b. Phyllaries yellow.

2a. Stems usually not branched; outer phyllaries apex rounded ............................................................................... 2. *H. arenarium*

2b. Stems branched; outer phyllaries apex acute .............................................................................................. 3. *H. thianschanicum*


喀什蜡菊 ka shi la ju

Herbs, perennial. Rhizome with flowering stems and sterile stems. Stems 10–15 cm tall; entire plant white lanate, denser on peduncles. Leaves oblong-oblanceolate, 1–3 cm × 2–5 mm, base gradually narrowed, semiamplexicaul, apex acuminate. Capitula in terminal corymb. Involucre 1.5–1.8 cm in diam.; phyllaries 4- or 5-seriate, ovate-lanceolate or lanceolate, 5–8 × ca. 2 mm; outer ones white, dry membranous, base dark brown, apex acuminate; inner ones lanceolate, subleathery, nearly black outside, margin white, membranous. Female florets few, narrowly funnelform, ca. 1.5 mm, limbs 5-lobed. Bisexual florets light brown, funnelform above, columnar below, ca. 4 mm, limbs 5-lobed. Pappus ca. 4 mm. Fl. Aug.

● Valleys; ca. 2000 m. Xinjiang.


沙生蜡菊 sha sheng la ju


Herbs, perennial. Rhizome woody, more often thick, 5–7(–15) mm in diam., or much thinner, only 1–4 mm in diam. Flowering stems few to numerous, 30–60 cm tall, branching approximately from middle (rarely simple), with slender ramosculae 5–12 cm; entire plant covered, with thin dense whitish-grayish tomentose pubescence. Leaves of sterile offshoots linear-spatulate, wider and longer than linear-lanceolate acuminate leaves of flowering stems. Capitula 3–6 or more arranged at ends of shoots and branches, narrowly campanulate or obconical, 5–7 × 4–6 mm, almost as long as peduncles, or sessile. Phyllaries ca. 30, yellow, rather loosely imbricate, arranged in 6 or 7 rows, ± squarrose in upper part, abaxially tomentose pubescent in lower part, outermost ones lanceolate and 1/3–1/2 as long as inner ones, linear-lanceolate or spatulate, acuminate or truncate at apex. Florets in a capitulum ca. 25. Pappus of ca. 40 very thin hairs. Fl. Jul–Sep. 2n = 56.

Grassy slopes; 400–2400 m. N Xinjiang [Mongolia, Russia; Europe].


天山蜡菊 tian shan la ju

Herbs, perennial. Rhizome up to 1 cm in diam., woody, fibrous-splintery, multicapit. Flowering stems few to numerous, 30–60 cm tall, branching approximately from middle (rarely simple), with slender ramosculae 5–12 cm; entire plant covered, with thin dense whitish-grayish tomentose pubescence. Leaves of sterile offshoots linear-spatulate, wider and longer than linear-lanceolate acuminate leaves of flowering stems. Capitula 3–6 or more arranged at ends of shoots and branches, narrowly campanulate or obconical, 5–7 × 4–6 mm, almost as long as peduncles, or sessile. Phyllaries ca. 30, yellow, rather loosely imbricate, arranged in 6 or 7 rows, ± squarrose in upper part, abaxially tomentose pubescent in lower part, outermost ones lanceolate and 1/3–1/2 as long as inner ones, linear-lanceolate or spatulate, acuminate or truncate at apex. Florets in a capitulum ca. 25. Pappus of ca. 40 very thin hairs. Fl. Jul–Sep. 2n = 28.

Gravelly places, dry slopes, dunes; below 3000 m. W Xinjiang [Kazakhstan].
14. Tribe HELIANTHEAE

向日葵族  xiang ri kui zu
Chen Yousheng  (陈又生); D. J. Nicholas Hind

Annual or perennial herbs, subshrubs, or shrubs. Rootstock fibrous, tuberous, or woody in form of a xylopodium. Leaves mostly opposite or mostly alternate, rarely whorled, petiolate or sessile, entire, lobed or rarely pinnatisect. Synflorescences of scapose capitula, or capitula arranged in axillary or terminal cymes, corymbs, or panicles, rarely with synflorescences with secondary or tertiary aggregation of capitula. Capitula either heterogamous radiate, heterochromous or homochromous, rarely disciform, or homogamous, discoid, homochromous, florets usually bisexual, rarely unisexual; involucres cylindric to hemispheric or rotate; phyllaries persistent, herbaceous, rarely membranous, 1–6-seriate, when 1-seriate sometimes with oil glands; receptacles usually flat or convex, sometimes hemispheric or conical, usually paleate; paleae usually deciduous, sometimes persistent, distinct or rarely connate, herbaceous to scarious, apices sometimes 3-lobed or -toothed. Ray florets neuter, or female and fertile; lamina entire or 2- or 3-toothed. Disk florets bisexual, fertile or sterile, 4- or 5-lobed; style branches truncate or appendiculate; anther thecae dark or pale, anther tails obtuse and entire, or sagittate, auriculate. Achenes often compressed or angled, usually black or blackish; pappus absent, or usually of (1 or)2(–8) scales and/or awns, sometimes coroniform.

About 210 genera and ca. 3,330 species: mostly in America; 34 genera (25 introduced) and 64 species (one endemic, 43 introduced) in China.


1a. Plant generally wind-pollinated or self-pollinated, capitula small and not showy; all florets unisexual, or if bisexual then capitula aggregated into glomerules; ray florets absent.

1b. Plant generally adapted for attracting pollinating insects, capitula colorful and attractive; some or all florets unisexual, or if bisexual 1-seriate capitula aggregated into glomerules. Capitula either heterogamous radiate, heterochromous or homochromous, rarely disciform, or homogamous, discoid, homochromous, florets usually bisexual, rarely unisexual; involucres cylindric to hemispheric or rotate; phyllaries persistent, herbaceous, rarely membranous, 1–6-seriate, when 1-seriate sometimes with oil glands; receptacles usually flat or convex, sometimes hemispheric or conical, usually paleate; paleae usually deciduous, sometimes persistent, distinct or rarely connate, herbaceous to scarious, apices sometimes 3-lobed or -toothed. Ray florets neuter, or female and fertile; lamina entire or 2- or 3-toothed. Disk florets bisexual, fertile or sterile, 4- or 5-lobed; style branches truncate or appendiculate; anther thecae dark or pale, anther tails obtuse and entire, or sagittate, auriculate. Achenes often compressed or angled, usually black or blackish; pappus absent, or usually of (1 or)2(–8) scales and/or awns, sometimes coroniform.

1a. Plant generally wind-pollinated or self-pollinated, capitula small and not showy; all florets unisexual, or if bisexual then capitula aggregated into glomerules; ray florets absent.

2a. Florets all bisexual; capitula aggregated into glomerules surrounded by leaflike bracts; achenes free and not surrounded by modified phyllaries into a bur or into spiny, tuberculate, or winged coat ........................................ 228. *Lagasea*

2b. Florets unisexual; capitula not aggregated into glomerules and lacking any outer leaflike bracts; achenes free and not surrounded by modified phyllaries into a pricky bur or spines, tubercules, or wings.

3a. Phyllaries in male capitula 1- or 2-seriate, free to base; phyllaries in female capitula 6–12-seriate, their distinct tips mostly ± hooked (distal 1–3 usually stouter, and not hooked), whole becoming a hard, prickly perigynium or bur; florets 2 ................................................................. 232. *Xanthium*

3b. Phyllaries in male capitula 1-seriate, connate; phyllaries in female capitula 1–8-seriate, usually with free tips forming tubercles, spines, or wings; florets 1(–5) ............................................................... 233. *Ambrosia*

1b. Plant generally adapted for attracting pollinating insects, capitula colorful and attractive; some or all florets unisexual; ray florets present, sometimes inconspicuous, rarely absent.

4a. Leaves and phyllaries with obvious oil glands.

5a. Phyllaries connate into a tube, sometimes splitting with age; style arms relatively long, spreading or arcuate; leaves lacking basal cilia ................................................................. 202. *Tagetes*

5b. Phyllaries free; style arms minute, scarcely bifurcated; leaf bases distinctly ciliate ................................................................. 203. *Pectis*

4b. Leaves and phyllaries lacking oil glands.

6a. Only ray florets fertile, ray achenes much longer than those of sterile disk florets.

7a. Leaves alternate; ray achenes strongly flattened, each achene ± enclosed by and often attached to subtending phyllary and 2 adjacent paleae, all falling as a unit ...................................................... 234. *Parthenium*

7b. Leaves opposite; ray achenes thick, rounded or weakly compressed, without wings; achenes thick, not obviously flattened, not falling as unit with adjacent paleae.

8a. Achenes enclosed and enclosed by prickly inner phyllaries ........................................ 214. *Acanthospermum*

8b. Achenes merely subtended by unarmed phyllaries ......................................................... 217. *Smallanthus*

6b. Disk florets fertile; ray florets present and fertile or sterile or absent.

9a. Ray florets with or without short tubes, persistent with corollas fused to apex of achene ........................................ 211. *Zinnia*

9b. Ray florets deciduous, of if ray florets absent (i.e., capitula disciform or discoid) then corollas not fused to apex of achene.

10a. Pappus of subulate to acerose scales, or spatulate, entire to erose, fimbriate, or lacinate, sometimes aristate, scales 1-seriate, or plumose, setiform scales (or flattened bristles) 1-seriate, or an apical peg.

11a. Pappus of plumose setae .................................................................................................. 212. *Tridax*

11b. Pappus of aristate or linear scales with erose or fimbriate margins, or absent.

12a. Pappus of 6–12 aristate, rarely linear scales with erose margins; capitula > 10 mm in diam. .................................................................................................................. 235. *Gaillardia*

12b. Pappus absent or of fimbriate, sometimes aristate scales; capitula 3–5 mm in diam. .................................................................................................................. 213. *Galinsoga*
10b. Pappus absent, or awned.
   13a. Achenes compressed.
      14a. Pappus of retrorsely barbed awns; leaves opposite or upper alternate.
      15a. Style branches with long hairs; pappus of 2 scabrid awns ..................... 205. Glossocardia
      15b. Style branches with short minute papillae; pappus of 2–4 scabrid awns.
         16a. Anther filaments pubescent; achene apex beaked ............................ 206. Cosmos
         16b. Anther filaments glabrous; achene apex narrow, not beaked ................ 207. Bidens
      14b. Pappus absent, or persistent, of 2 bristly cusps or scales; leaves opposite.
      17a. Phyllaries 2-seriate, outer few and smaller, inner membranous, connate at base; pappus of 2–4 awns or scales or absent ................................................. 208. Coreopsis
      17b. Phyllaries free, outer leathery, subequal, inner shorter, similar with paleae; ray achenes narrowly oval and winged, with 2 triangular scales.
         18a. Achenes markedly dimorphic, those of ray florets with conspicuous, lacerate winged margin, others wingless ..................................................... 209. Synedrella
         18b. Achenes all ± alike, wingless or somewhat thickly winged distally, not lacerate.
         19a. Shrubs or small trees; synflorescence of numerous capitula in congested panicles or corymb; achenes wingless ........................................ 223. Clibadium
         19b. Annual or perennial herbs; synflorescence of solitary capitula or capitula several in dense clusters; achenes winged or angled.
      20a. Capitula radiate; pappus of 2 stout awns ........................................ 220. Calyptocarpus
      20b. Capitula discoid; pappus peglike ........................................................... 221. Eleutheranthera
   13b. Achenes all relatively plump, or 3–5-angled in ray florets and compressed in disk florets.
      21a. Achenes enclosed by inner phyllaries or outer paleae.
         22a. Capitula tightly or loosely aggregated on short peduncles in corymbose panicles ........................................................................................................ 204. Flaveria
         22b. Capitula axillary or in sparse cymes or panicles.
            23a. Female florets 1-seriate; phyllaries 5, spreading; capitula in sparse panicles, peduncles long ............................................................ 216. Sigesbeckia
            23b. Female florets multiseriate; phyllaries 4, broad, in 2 pairs; capitula axillary, peduncles very short .............................................................. 209. Enydra
      21b. Achenes not enclosed by inner phyllaries.
         24a. Paleae narrow, long, flat; ray florets 2-seriate, lamina small; pappus absent or of 2 short awns.
         25a. Ray floret lamina white; achene body tuberculate ........................................ 222. Eclipta
         25b. Ray floret lamina yellow; achene body striate ........................................ 215. Guizotia
         24b. Paleae concave or folded, ± enclosing florets.
            26a. Achenes in ray florets broadly ovate or elliptic, 3-angled; disk achenes ellipsoid, strongly compressed; pappus absent or of up to 10 awnlike bristles ........................................................................................................ 210. Acmella
            26b. Achenes in bisexual florets 4- or 5-angled, or compressed.
               27a. Ray florets sterile.
                  28a. Paleae completely investing and falling with accompanying achene, each forming a hardened perigynium .............................................................. 227. Sclerocarpus
                  28b. Paleae sometimes conduplicate, ± enfolding achenes, not forming perigynium.
                     29a. Pappus absent, a small crown of minute scales, or of 2–4 small scales; receptacles conical to columnar ... 229. Rudbeckia
                     29b. Pappus of 2 awns sometimes with a few scales, or a crown of fused scales, or of 2 awns with fused scales, or absent; receptacles flat to shallowly convex.
                        30a. Peduncles usually distally dilated, always fistulose; pappus absent or coroniform, of connate scales, 1 or 2 scales sometimes subulate to aristate ........... 230. Tithonia
                        30b. Peduncles never fistulose; pappus absent or readily deciduous, of 2(or 3) usually lanceolate, aristate, or erose scales, plus 0–8 usually shorter scales .............................................................. 231. Helianthus
27b. Ray florets fertile.
   31a. Pappus elements 2–5, unequal, spinelike or squamalike, persistent, base connate; ray florets female, ray floret lamina short or very short, apex 2–4-dentate; capitula small .............................................................................. 218. Blainvillea

31b. Pappus absent, or scalelike, cyathiform, coroniform, or of 1 or 2 setae; capitula relatively large.
   32a. Corollas orange to yellow; outer phyllaries herbaceous and larger than inner; leaves sessile or very shortly petiolate; plants mainly prostrate; achenes triangular (ray) or compressed (disk); capitula always solitary, terminal (but appearing axillary) on erect peduncles; achene beak and pappus obscured at maturity by corky collar ............................................................. 224. Sphagneticola
   32b. Corollas white or yellow; outer phyllaries ± equal in size to inner; leaves usually conspicuously petiolate; plants mostly erect or ascending [sometimes vines or subshrubs outside of our area]; synflorescence of 1–3(–6) capitula, terminal or axillary; pappus of obvious setae (rarely absent).
   33a. Ray florets female and sterile or neuter; pappus awns caducous ...................................... 225. Melanthera
   33b. Ray florets female and fertile; pappus absent or single awn persistent ..................................... 226. Wollastonia


万寿菊属 wan shou ju shu

Annual or perennial herbs, subshrubs, or shrubs. Stems erect, branched distally or throughout. Leaves cauline, mostly opposite (distal sometimes alternate), petiolate or sessile; blades mostly lanceolate to oblanceolate overall, usually pinnately 1–3-lobed or -pinnatisect, ultimate margin toothed or entire, both surfaces glabrous or hairy. Synflorescence of solitary capitula or of sometimes dense, many-headed corymbs. Capitula radiate or discoid; calyculus absent; involucres narrowly cylindric or fusiform to turbinate or broadly campanulate, 1–12+ mm in diam.; phyllaries persistent, 1- or 2-seriate (connate to 7/8+ their lengths, usually streaked and/or dotted with oil glands); receptacle convex to conical, smooth or finely pitted, epealeate. Ray florets female, fertile (except “double” cultivars); lamina yellow or orange, red-brown, or white. Disk florets bisexual, fertile; corollas greenish yellow to orange, sometimes tipped with red or red-brown, tubes much longer than or ± equaling funnelform throats, lobes 5, deltap petaloid to linear-lanceolate. Achenes narrowly obpyramidal or fusiform-terete, sometimes weakly flattened, glabrous or hairy; pappus persistent, of 2–5(–10) dissimilar, distinct or connate, 1-seriate scales: 0–5+ oblong to lanceolate, erose-truncate or laciniate, 0–2(–5) longer, subulate to aristate.

x = 12.

About 40 species: tropical and warm-temperate America, especially Mexico; two species (both introduced) in China.

1a. Synflorescence of solitary terminal capitula; ray limb yellow to orange or reddish brown, rarely white (in cultivars); disk florets (10–)50–120 ................................................................. 1. T. erecta
1b. Synflorescence of dense terminal corymbs of numerous capitula; ray limb pale yellow to cream; disk florets 4–7 .... 2. T. minuta


万寿菊 wan shou ju

*Tagetes patula* Linnaeus; *T. tenuifolia* Cavanilles.

Annuals, 10–120 cm. Leaf blades 30–120(–250) mm overall, principal lobes/leaflets 9–25, lanceolate to oblanceolate, 15–25(–45) × 3–8(–12) mm. Capitula solitary; peduncles 30–100(–150) mm; involucres 10–22+ × (3–)5–12 mm; phyllaries 5–8. Ray florets (3–)5–8(–100 in “double” cultivars); lamina yellow to orange, red-brown (sometimes bi-colored: yellow/red-brown), or white (some cultivars), flabellate to ovate-quadrate, (2–)12–18(–25) mm. Disk florets (10–)50–120; corollas 7–12 mm. Achenes 6–11 mm; pappus of 0–2 subulate-aristate scales 6–12 mm and 2–4 distinct or connate, linear-oblong, erose scales 2–6+ mm. Fl. Jun–Oct. 2n = 24, 48.

Widely cultivated in China [native to North America].

Cultivars of *Tagetes erecta* are widely grown in gardens and, commercially, for cut flowers. They often persist after plantings are abandoned. Tetraploid plants (2n = 48) with smaller involucres and wholly or partially red-brown corollas included here in *T. erecta* have been called *T. patula* by some botanists.


印加孔雀草 yin jia kong que cao

*Tagetes bonariensis* Persoon; *T. glandulifera* Schrank; *T. porophyllum* Vellozo; *T. riojana* M. Ferraro.
Annual herbs, 10–250 cm, plant aromatic. Stems much branched in larger plants and almost woody, ribbed, glabrous, glandular. Leaves mostly opposite, often alternate in upper part, dark green, pinnatisect, elliptic in outline, 3–30 × 0.7–8 cm, rachis narrowly winged, lobes up to 17, linear-oblong, to 11 × 1 cm, with orange glands. Synflorescence a dense terminal cor-ymb. Capitula narrowly cylindric; involucre 8–12 mm; phyllaries 3 or 4, yellow-green, fused, glabrous, with brown or orange linear glands. Ray florets 2 or 3, pale yellow to cream, lamina 2–3.5 mm. Disk florets 4–7, yellow to dark yellow, 4–5 mm. Achenes black, narrowly ellipsoid, 6–7 mm, pilose; pappus of 1 or 2 setae to 3 mm and 3 or 4 scales to 1 mm, apices ciliate.

Recently naturalized in Taiwan [widespread in Central and South America; naturalized in Africa (Kenya, South Africa) and Australia].

The occurrence of this species in Taiwan was first reported by C. M. Wang and Chih H. Chen (Taiwania 51: 32–35, 2006).


### Lorentea Lagasca (1816), not Ortega (1797).

Annual or perennial herbs, often strongly scented, sparsely to densely branched. Stems slender, terete to slightly angled, glabrous or hirtellous, or puberulent with retrorsely curved hairs. Leaves opposite, sessile, simple, glandular punctate with glandular oil pits, margin entire or rarely toothed or lobed, ciliate with slender bristles mostly toward base; midvein strong, without prominent secondary veins. Inflorescences terminal on stems or branches, in loose to dense cymose clusters or with solitary capitula; peduncles minutely 3-lobed. Disk florets 3 to ca. 40, fertile, bisexual; corolla yellow, sometimes drying purplish, glabrous or puberulent with basal pockets of phyllaries, equal in number to phyllaries, uniseriate, fertile; corolla yellow to reddish, with distinct limb, apex setosa. Ray florets inserted in basal pockets of phyllaries, equal in number to phyllaries, uniseriate, fertile; corolla yellow to reddish, with distinct limb, apex setosa.

Recently naturalized in Taiwan [widespread in Central and South America; naturalized in Africa (Kenya, South Africa) and Australia].

About 85 species: tropical and subtropical America, especially Mexico; one species (introduced) in China.

1. **Pectis prostrata** Cavanilles, Icon. 4: 12. 1797.

### Lorentea prostrata (Cavanilles) Lagasca; **Pectis costata** Seringe & P. Mercier ex Candolle, nom. illeg. superfl.; **P. multi-setosa** Rydberg; **P. prostrata** var. urceolata Fernald; **P. urceolata** (Fernald) Rydberg.

Annual herbs. Stems prostrate or ascending, 1–30 cm, puberulent, hairs in 2 rows. Leaves linear to narrowly ob lanceolate, 10–30 × 1.5–7 mm, axially densely pubescent and dotted with conspicuous orbicular oil glands, axially glabrous, margin with conspicuous, spreading basal cilia or bristles ca. 1–3 mm. Inflorescences of solitary terminal capitula or capitula in groups of 2 or 3; peduncles 1–2 mm, bracteolate. Capitula radiate, heterogamous; involucre campanulate to cylindric, appearing almost urceolate; phyllaries 5 or 6, uniseriate, oblong to obovate, 5–7 × 1–3 mm, glabrous, apex truncate. Ray florets 5, female; ray limb bright yellow, 3.5–4 mm, scarcely exceeding involucre, apex scarcely shortly lobed. Disk florets 6–15 (but reported as 10–18 in Taiwan), bisexual; corolla yellow, ca. 2.5 mm. Achenes fusiform, 3–3.7 mm; body weakly many ribbed, sparsely to densely setuliferous; pappus of 3–5 stout, whitish, lanceolate scales 1.5–2.5 mm with margin laciniate. Fl. probably year-round. 2n = 24 (from Mexican material).

Recently introduced weed cultivated and now naturalized in grassland and along some riverbanks. Taiwan [native to Caribbean region, Central America, Mexico, and S United States].

204. **FLAVERIA** Jussieu, Gen. Pl. 186. 1789.

### Flaveria urceolata (Fernald) Lagasca; **Pectis urceolata** Cavanilles; **Pectis setosa** (Kunth) Lagasca; **Pectis urceolata var. urceolata** Fernald; **P. urceolata** (Fernald) Rydberg.

Annuals, perennials, or subshrubs. Stems erect or decumbent, branched. Leaves cauline, opposite, petiolate or sessile; blade oblong-ovate to lanceolate or linear, both surfaces glabrous or shortly pubescent, margin entire or serrate, or spinulose-serrate. Synflorescences of lax or dense aggregations of capitula in corymbose panicles or glomerules. Capitula radiate or discoid; involucre campanulate to cylindrical, appearing almost urceolate; phyllaries 5 or 6, uniseriate, oblong to obovate, 5–7 × 1–3 mm, glabrous, apex truncate. Ray florets 5, female; ray limb bright yellow, 3.5–4 mm, scarcely exceeding involucre, apex scarcely shortly lobed. Disk florets 6–15 (but reported as 10–18 in Taiwan), bisexual; corolla yellow, ca. 2.5 mm. Achenes fusiform, 3–3.7 mm; body weakly many ribbed, sparsely to densely setuliferous; pappus of 3–5 stout, whitish, lanceolate scales 1.5–2.5 mm with margin laciniate. Fl. probably year-round. 2n = 24 (from Mexican material).

About 21 species: India, Mexico, United States; Africa, Caribbean, Central and South America; one species (introduced) in China.


鹿角草属 lu jiao cao shu

Herbs, perennial, glabrous, with a thick caudex. Stems erect, branched; leaves few. Radical leaves crowded, long petiolate, pinnately parted; cauline leaves alternate. Capitula small, solitary or few in corymbs, heterogamous; phyllaries 1–4-seriate, outer phyllaries and paleae oblong, slightly connate, somewhat inflated at base, inner palea narrowed, flat. Ray florets 1-seriate, female, fertile; corollas spreading, 3-lobed. Disk florets tubular, bisexual; corollas 4-lobed; anthers obtuse at base. Achenes glabrous, flattened dorsally, linear, truncate; pappus of 2–4 retrorsely barbed awns, sometimes papillate, usually with 1 groove; pappus of 2–4(–8) retrorsely barbed awns, sometimes papillate, usually with 1 groove; pappus absent.

Eleven species: N Africa, tropical Asia to S Australia and the Pacific islands; one species in China.


鹿角草 lu jiao cao


Herbs, perennial. Stems woody at base, 20–30 cm, somewhat tufted. Radical leaves persistent, 4.5–9 cm, glabrous, sometimes undivided and linear, usually pinnately parted, segmented 2 or 3 pairs, remote, spreading, linear, 1.8–2 mm wide, obtuse, lower segments 8–20 mm, petiole 2.7–6 cm; median leaves few, remote, petiolate, 3–4 cm, pinnately parted or linear, upper leaves smaller, linear. Capitula ca. 7 mm in diam., solitary, basal bracteoles ca. 1.5 mm; phyllaries and paleae ca. 7, oblong, ca. 3 mm. Ray florets few, 1-seriate, fertile; corolla ca. 3.5 mm, lip 3-lobed. Disk florets: corolla ca. 2.5 mm, apex 4-lobed. Pappus awns erect, 1.5–2 cm. 2n = 24.

Exposed coastal areas, sometimes on raised coral reefs; low elevations. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Xizang [Bangladesh, India, Indonesia, Malaysia, Papua New Guinea, Philippines, Thailand, Vietnam; Australia, Pacific islands (New Caledonia)].

206. COSMOS Cavanilles, Icon. 1: 9. 1791.

秋英属 qiu ying shu

Annuals, perennials, or subshrubs. Stems usually 1, erect or ascending, branched distally or ± throughout. Leaves mostly cauline, opposite, petiolate or sessile; blades usually pinnately 1–3-lobed or undivided, ultimate margin usually entire, both surfaces usually glabrous, sometimes glabrate, hispid, puberulent, or scabridulous. Synflorescence of solitary capitula or corymb. Capitula radiate, borne singly or in corymbiform arrays; calycular bracts (5–)8, basally connate, ± linear to subulate, herbaceous; involucres hemispheric or subhemispheric, 3–15 mm in diam.; phyllaries 1–4-seriate, remote, spreading, linear, 1.8–2 mm wide, obtuse, lower segments 8–20 mm, petiole 2.7–6 cm; median leaves few, remote, petiolate, 3–4 cm, pinnately parted or linear, upper leaves smaller, linear. Capitula ca. 7 mm in diam., solitary, basal bracteoles ca. 1.5 mm; phyllaries and paleae ca. 7, oblong, ca. 3 mm. Ray florets few, 1-seriate, fertile; corolla ca. 3.5 mm, lip 3-lobed. Disk florets: corolla ca. 2.5 mm, apex 4-lobed. Pappus awns erect, 1.5–2 cm. 2n = 24.

Exposed coastal areas, sometimes on raised coral reefs; low elevations. Fujian, Guangdong, Guangxi, Hainan, Taiwan, Xizang [Bangladesh, India, Indonesia, Malaysia, Papua New Guinea, Philippines, Thailand, Vietnam; Australia, Pacific islands (New Caledonia)].

1. Cosmos bipinnatus Cavanilles, Icon. 1: 10. 1791.

秋英 qiu ying

Plants 30–200 cm tall, glabrous or sparsely puberulent, sometimes scabridulous. Leaves sessile or with petioles up to 1 cm; blade 6–11 cm, ultimate lobes to 1.5 mm wide, margin entire, apex acute. Capitula solitary, 3–6 cm in diam.; peduncles 10–20 cm; calycular bracts spreading, linear to lanceolate, 6–13
mm, apices acuminate; involucre 7–15 mm in diam.; phyllaries erect, lanceolate to ovate-lanceolate, 7–13 mm, apices rounded or obtuse. Ray corollas white, pink, or purplish, lamina obovate to oblanceolate, 15–50 mm, apices ± truncate, dentate. Disk corollas 5–7 mm. Achenes 7–16 mm, glabrous, papillose; pappus absent, or of 2 or 3 ascending to erect awns 1–3 mm. Fl. Jun–Aug. 2n = 24.

Widely introduced in China [native to Mexico and SW United States]. A favorite garden plant, this species has escaped and naturalized widely in warm climates almost worldwide.

2. Cosmos sulphureus Cavanilles, Icon. 1: 56. 1791.

1b. Achenes broad, cuneate or obovate-cuneate, apex truncate.

5a. Achenes 4-angled, barbed awns usually 4; disk floret corolla 5-dentate; ray florets present ........................................... 1. B. cernua
5b. Achenes compressed, barbed awns usually 2; disk floret corolla 4- or 5-dentate; ray florets absent.

6a. Median cauline leaves of pinnate compound leaves .......................................................... 2. B. frondosa
6b. Median cauline leaves of dissected simple leaves, rarely entire leaves.

7a. Leaves deeply dissected.

8a. Capitula subequal in length and diam.; outer phyllaries 5–9; achenes 6–11 mm ................................. 3. B. tripartita
8b. Capitula unequal in length and diam.; outer phyllaries 9–14; achenes 3–4.5 mm ............................. 4. B. maximowicziana
7b. Leaves not dissected or 3-lobed.

9a. Outer phyllaries 9–12(–14), oblong-linear or lanceolate-linear, 8–20 mm; corolla 4-toothed ................... 5. B. radiata
9b. Outer phyllaries usually 4, elliptic, oblong, or linear, 1.5–3.8 cm; corolla 5-toothed .......................... 6. B. leptophylla

Chinese: 柳叶鬼针草  liu ye gui zhen cao

**Bidens cernua** var. *elliptica* Wiegand; *B. cernua* var. *integrata* Wiegand; *B. cernua* var. *minima* (Hudson) Pursh; *B. cernua* var. *oligodonta* Fernald & H. St. John; *B. cernua* var. *radiata* Candolle; *B. filamentosa* Rydberg; *B. glaucescens* Greene; *B. gracilenta* Greene; *B. minima* Hudson; *B. prionophylla* Greene.

Annuals, 10–100 cm tall. Leaves sessile; blade ovate-lanceolate or ob lanceolate to lanceolate or linear, 40–100(–200) × (2–)5–25–45 mm, both surfaces glabrous, base cuneate to rounded, margin usually coarsely dentate to serrate, sometimes entire, sometimes ciliate, apex acute to acuminate. Capitula radiate, rarely discoid, solitary or in lacy corymb; peduncles 10–40(–100+) mm; calycal bracts (3–)5–8(–10), spreading to reflexed, oblong to linear-lanceolate, often ± leaflike, (3–)8–12(–25) mm, abaxially usually glabrous, bases sometimes hirsute, margin usually ciliately; involucres hemispheric or broader, (3–)6–10 × (8–)12–20+ mm; phyllaries 6–8+, ovate or ovate-lanceolate to lanceolate, 2–10 mm. Ray florets usually 5–8, sometimes absent; lamina orange-yellow, 2–15(–18) mm. Disk florets (10–)40–100(–150+); corollas orange-yellow, 2–15 mm. Achenes blackish or brown, usually flattened, sometimes 3(or 4)-angled, glabrous or sparsely hirtello s, margin usually ciliate, apices truncate to convex; pappus of 2(–)4 retrorsely barbed awns (1–)2–4 mm. Fl. Aug–Oct. 2n = 24, 48.

Swamps, marshes, peat and sedge bogs, flood plains; sea level to 2300 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Sichuan, Xizang, Yun nan [Native to North America].


Chinese: 大狼杷草  da lang pa cao

**Bidens frondosa** var. *anomalra* Porter ex Fernald; *B. frondosa* var. *caudata* Sherff; *B. frondosa* var. *pallida* (Wiegand) Wiegand; *B. frondosa* var. *stenodonta* Fernald & H. St. John; *B. melanocarpa* Wiegand; *B. melanocarpa* var. *pallida* Wiegand.

Annuals, 20–120 cm tall. Leaves petiolate; petiole 10–40(–60) mm; blade deltate to ovate-lanceolate overall, 30–80(–150) × 20–60(–100) mm, 3(or 5)-foli ariate, leaflets petiolate, lanceolate to ovate-lanceolate, (15–)35–60(–120) × (5–)10–20(–30) mm, both surfaces glabrous or hirtellous, bases cuneate, margins dentate to serrate, sometimes ciliate, apices acuminate to attenuate. Capitula radiate or discoid, usually solitary, sometimes in 2s or 3s or in lacy corymb; peduncles 10–40(–80) mm; calycal bracts (5–)8(–10), ascending to spreading, spatulate or ob lanceolate to linear, sometimes ± leaflike, 5–20(–60) mm, abaxially glabrous or hirtellous, margins usually ciliate; involucres campanulate to hemispheric or broader, 6–9 × 7–12 mm; phyllaries 6–12, oblong or ovate to ovate-lanceolate, 5–9 mm. Ray florets 0 or 1–3; lamina golden yellow, 2–3.5 mm. Disk florets 20–60(–120+); corollas ± orange, 2.5–3+ mm. Achenes blackish to brown or straw-colored, ± obcompressed, obovate to cuneate, outer 5–7 mm, inner 7–10 mm, faces usually 1-veined, sometimes tuberculate, glabrous or sparsely hirtellous, margin antor sosly or retrorsely barbed, apices ± truncate to concave; pappus of 2 ± erect to spreading, antor sosly or retrorsely barbed awns 2–5 mm. Fl. Aug–Sep. 2n = 24, 48, 72.

A weed in moist woods, meadows, thickets, fields, roadsides, railroads, borders of streams, ponds, sloughs, swamps, ditches. Guangdong, Jiangsu, Jiangxi, Shanghai [Native to North America].


Chinese: 狼杷草  lang pa cao

**Bidens repens** D. Don; *B. shimadai Hayata; B. tripartita** var. *quinqueloba* C. H. An; *B. tripartita** var. *repens* (D. Don) Sherff; *B. tripartita** var. *shimadai* (Hayata) Yamamoto.

Annuals, 10–150 cm tall. Leaves sessile or petiolate; petiole (0–)5–15–35 mm (± winged); blade elliptic to ovate or lanceolate, 40–80(–150) × 15–40(–60) mm, sometimes lacinately 1-pinnatisect with 1–4+ lobes near base, both surfaces glabrous or hirtellous, base cuneate, margin entire or dentate to serrate, usually ciliate, apex acute to acuminate. Capitula radiate or discoid, solitary or in 2s or 3s; peduncles 10–40(–80) mm; calycal bracts (2–)6 or 7–10, spreading, ob lanceolate or lanceolate to linear, ± leaflike, 7–35(–60) mm, abaxially hirsute near bases, distally glabrous, margins entire or serrate, sometimes sparsely ciliately; involucres campanulate to hemispheric or broader, (4–)5–7(–12) × (3–)6–12(–15) mm; phyllaries (6 or)7 or 8(–13), elliptic-ovate to ovate-lanceolate, (4–)6–9(–12) mm. Ray florets usually 0, sometimes 1–5; lamina orange yellowish, 4–8 mm. Disk florets (5–)20–60(–150); corollas pale yellow to orange, (2–)3–4 mm, apex 4–5-toothed. Achenes blackish to purplish or brown, ± flattened, sometimes weakly 3(or 4)-angled, usually cuneate to linear, outer (3–)6–7(–10) mm, inner (4–)6–9(–11) mm, faces ± 1-veined, usually smooth, seldom notably tuberculate, glabrous or sparsely strigillose, margin proximally antor sosly to patently, distally retrorsely, barbed, apices ± truncate to concave; pappus 0, or of 1–3(or 4) erect to spreading, retrorsely barbed awns (0.2–)2–3(–6) mm. Fl. Jul–Oct. 2n = 48.

Swamps, marshes, peat and sedge bogs, flood plains; sea level to 2300 m. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Sichuan, Xizang, Yunnan [Native to North America].


Chinese: 柳叶鬼针草  liu ye gui zhen cao

Annuals. Stems 30–50(–80) cm tall, erect, simple or branched with obliquely upright branches, glabrous or sparsely and finely hairy mainly in upper part. Leaves petiolate, pinnatisect (rarely ternate); segments narrow and long, oblong to linear, laterals (1 or)2 or 3, 2–3 cm to 7–8 cm, apical segments usually larger than laterals, serrate-toothed, margins fine with appressed prickles. Capitula discoid, solitary or in groups of 2 or 3 at apex of stem and its branches, flat, wider than long and
Bidens radiata

Annuals. Stems (5–)15–60–(80) cm tall, erect, branched, in upper part simple, glabrous or distinctly hairy. Leaves yellowish green, 3–5-parted or dissected, lateral parts lanceolate or ovate-rhombic, serrate-toothed, apical part much larger than lateral, glabrous or subglabrous, on rather long petioles, sometimes entire, large toothed to part (Bidens radiata f. pseudocerma Ganeschin). Capitula discoid, erect, 12–15 (–20) mm wide, wider than long (sometimes almost 2 ×); calycular bracts narrowly linear, exceeding in length to equal to achenes (including awns); outer phyllaries (9 or)10–12(–14), oblong-linear or lanceolate-linear, 8–20 mm, leaflike, margin with fine prickles, considerably exceeding florets (sometimes almost 3 ×), inner shorter, oval. Florets tubular. Achenes cuneate, 3–4 mm, glabrous, compressed, with 2 awns, equal to or almost shorter than achenes, sometimes awns 4, but then 2 longer than other 2. Fl. Jun–Sep.

Riverbanks, lakes, marshes, wet meadows, wet ditches. Heilongjiang, Jilin, Nei Mongol, Xinjiang [Japan, Korea, Mongolia, Russia].


Annuals. Stems (5–)15–60–(80) cm tall, erect, branched, in upper part simple, glabrous or indistinctly hairy. Leaves yellowish green, 3–5-parted or dissected, lateral parts lanceolate or ovate-rhombic, serrate-toothed, apical part much larger than lateral, glabrous or subglabrous, on rather long petioles, sometimes entire, large toothed to part (Bidens radiata f. pseudocerma Ganeschin). Capitula discoid, erect, 12–15 (–20) mm wide, wider than long (sometimes almost 2 ×); calycular bracts narrowly linear, exceeding in length to equal to achenes (including awns); outer phyllaries (9 or)10–12(–14), oblong-linear or lanceolate-linear, 8–20 mm, leaflike, margin with fine prickles, considerably exceeding florets (sometimes almost 3 ×), inner shorter, oval. Florets tubular. Achenes cuneate, 3–4 mm, glabrous, compressed, with 2 awns, equal to or almost shorter than achenes, sometimes awns 4, but then 2 longer than other 2. Fl. Jun–Sep.

Riverbanks, lakes, marshes, wet meadows, wet ditches. Heilongjiang, Jilin, Nei Mongol, Xinjiang [Japan, Korea, Mongolia, Russia; Europe].


Annuals, up to 25 cm tall. Leaves opposite; blade ovate-elliptic, ovate-rhombic, or oblong, 1.8–5.8 × 0.5–2 cm together with petiole, base decurrent to petiole, margin 1–3-toothed, sometimes with a pair of lobes from base, apex shortly acute; lobes oblong-linear. Capitula discoid, solitary, terminal or axillary; involucre 8–10 × 5–8 mm; outer phyllaries usually 4, leaflike, elliptic, oblong, or linear, 1.5–3.8 cm, margin entire or 1–3-toothed, apex acute, inner brown, leathery. Corollas yellow, 3–3.5 mm, apex 5-lobed. Achenes cuneate, ca. 6 × 2 mm, compressed, 2-ribbed; pappus of 2 barbed awns ca. 2.5 mm.

● Farmland. Xinjiang [Yiwu].


Annuals. Stems (10–)20–50–(80) cm tall, erect, branched, glabrous or bearing rarely indistinct hairs. Leaves bi- or tripinnatisect with narrow lanceolate or linear-lanceolate to linear segments, with small teeth and incisions on petioles, usually sparsely fine hairy to subglabrous. Capitula discoid, solitary (or 2 or 3) at stem and branch apices, on long peduncles, narrow, subcylindric; calycular bracts linear, shorter than achenes; outer phyllaries green, narrowly linear, herbaceous, finely hairy, shorter than inner ones, inner greenish brown, linear-lanceolate, bearing rarely short bristles only on margin. Florets all tubular, yellow, few. Achenes linear-tetragonal, ± compressed, beset with upright lucid bristles along ribs, otherwise glabrous or finely hairy, unequal in length; inner 15–20–(25) mm, outer shorter, 2 upright awns, 4–5 mm, at top of achenes. Fl. Jul–Sep.

Marshes, fields, streamsides. Anhui, Gansu, Guizhou, Hebei, Heilongjiang, Henan, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan [Japan, Korea, Mongolia, Russia].


Annuals. Stems 30–180 cm tall, glabrous or very sparsely pubescent in upper part. Petiole 10–30–(70) mm; leaf blade either ovate to lanceolate, 30–70–(120) × 12–18–(45) mm, or pinnately 1-lobed, primary lobes 3–7, ovate to lanceolate, (10–)25–80 × (5–)10–40 mm, both surfaces pilosulose to sparsely hirtellous or glabrate, bases truncate to cuneate, ultimate margin serrate or entire, usually ciliate, apices acute to attenuate. Synflorescence of solitary capitula or capitula in lax corymbs. Capitula radiate or discoid; peduncles 10–20–(90) mm; calycular bracts (6 or)7–9–(13), appressed, spatulate to linear, 3–4–5 mm, abaxially usually hispidulous to puberulent, margins ciliate; involucres turbinate to campanulate, 5–6–6–8 mm; phyllaries (7 or)8 or 9–(13), lanceolate to oblongate, 4–6 mm. Ray florets absent or (3–)5–8; lamina whitish to pinkish, 5–15 mm. Disk florets 20–40–(80); corollas yellowish, (2–)3–5–5 mm. Outer achenes red-brown, ± flat, linear to narrowly cuneate, (3–)4–5 mm, faces obscurely 2-grooved, sometimes tuberculate-hispidulous, margin antrorsely hispidulous, apex truncate or somewhat attenuate; inner achenes blackish, ± equally 4-angled, linear-fusiform, 7–16 mm, faces 2-grooved, tuberculate-hispidulous to sparsely striigillose, margin antrorsely hispidulous, apex attenuate; pappus absent, or of 2 or 3–(5) erect to divergent, retrorsely barbed awns (0.5–)2–4 mm. Fl. year-round. 2n = 24, 36, 48, 72.

Roadsides, fields, villages; below 2500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hebei, Hunan, Jiangxi, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xi-zang, Yunnan, Zhejiang [tropical and subtropical regions].


Annual herbs, (15–)30–100–(150+) cm. Petioles 20–50 mm; leaf blade orbicular-deltate to ovate or lanceolate overall, (20–)30–70+ × (20–)30–60+ mm, (1 or)2(3)–pinnatisect, ultimate lobes obovate or lanceolate, 15–45+ × 10–25+ mm, both surfaces usually glabrous, sometimes hirtellous, bases truncate to cuneate, ultimate margin entire, sometimes ciliolate, apices...
rounded to acute or attenuate. Synflorescences of solitary capitula or ± corymbose; peduncles (10–)20–50(–100) mm. Capitula radiate or discoid; calycular bracts (7 or)8(–10), linear, 3–5 mm, ± appressed, abaxially usually glabrous, margin ciliate; involucres ± campanulate, 5–7 × 3–4(–5) mm; phyllaries 8–12, lanceolate to linear, 4–6 mm. Ray florets absent or 3–5+; lamina yellowish or whitish, 1–2(–3) mm. Disk florets 10–20(–30+); corollas yellowish to whitish, 2–3 mm. Achenes red-brown, outer weakly obcompressed, 7–15 mm, inner ± 4-angled, linear to linear-fusiform, 12–18 mm, faces 2-grooved, often tuberculate-hispidulous, margin not ciliate, apex ± attenuate; pappus of (2 or)3 or 4 erect to divergent, retrorsely barbed awns 2–4 mm. Fl. Aug.–Oct. 2n = 24, 72.

Fields, forests, disturbed wetland sites; below 1800(–3000) m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Hebei, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Cambodia, Korea, Laos, Nepal, Thailand, Vietnam; Europe, North and South America, Pacific islands].


金盏银盘 jin zhan yin pan

Annuals, perennials, subshrubs, or shrubs, often rhizomatous or with cormiform bases. Stems usually 1, erect, branched distally or ± throughout. Leaves basal, basal and cauliine, or cauline, opposite or alternate or both, petiolate or sessile; blades simple and usually entire, or pinnately or pedately lobed, both surfaces glabrous or hairy. Synflorescence of solitary capitula or capitula in lax corymbs. Capitula radiate; calycular bracts (3–)8+; distinct, ± herbeaceous; involucres ± gloseboe to cylindric, 4–25+ mm in diam.; phyllaries usually ca. 8, ca. 2-seriate; receptacle flat to convex; paleae deciduous, ovate to linear or subulate, flat, scarious. Ray florets mostly (5–)8(–12+), neuter, or stelliferous and sterile, or female and fertile; corollas usually yellow, sometimes red-brown to purple proximally, sometimes wholly purple or pink to white. Disk florets 8–150+, bisexual, fertile; corollas usually yellow, sometimes red-brown to purple at tips or throughout, tubes equaling or shorter than narrowly funnelform throats, lobes 4 or 5. Achenes obcompressed, ± orbicular to oblong, or linear, usually thin margined or winged, wings membranous to papery or corky, entire or lobed to toothed, sometimes ciliolate; faces smooth or ± papillate to tuberculate; pappus absent, or persistent, of 2 bristly cusps or scales, sometimes pappus absent and shoulders of achenes wings bristly and pappuslike. x = 14.

About 35 species: mostly temperate North America, also tropical New World and Old World; three species (all introduced) in China.

Coreopsis verticillata Linnaeus is cultivated in China.

1a. Ray florets yellow above, base reddish brown; disk florets reddish brown; achenes wingless ........................................ 1. C. tinctoria
1b. Ray florets and disk florets yellow; achenes winged.

2a. Achenes broadly elliptic or subrounded; lower leaves pinnately dissected ........................................ 2. C. grandiflora
2b. Achenes rounded; lower leaves entire ................................................................. 3. C. lanceolata


两色金鸡菊 liang se jin ji ju

Annuals, (10–)30–70(–150) cm. Leaves: proximal blades usually 1(–3)-pinnate, terminal lobes ovate-lanceolate to oblan-
ceolate, 10–60 × 5–25 mm; cauline blades usually 1–3-pinnate, rarely simple, simple blades or terminal lobes linear-lanceolate to linear or filiform, 10–45 × 0.5–5 mm. Pedicules 1–15 cm; calycal bracts deltate-lanceolate, 1–3+ mm; phyllaries ± oblong-lanceolate to ovate-lanceolate, 4–9 mm. Ray limbs usually yellow with red-brown blotch, sometimes red-brown in proximal 1/3–9/10 and distally yellow; rarely yellow throughout, 12–18+ mm. Disk corollas 2.5–3+ mm. Achenes 1.5–4 mm, wings absent or 0.1–0.7 mm wide; pappus absent, or of 1 or 2 cusps or subulate scales 0.1–1 mm. Fl. Jun.–Aug. 2n = 24.

Moist sandy or clay soils, sometimes alkaline flats, prairies, ditches, disturbed sites. Widely cultivated and naturalized in China [native to North America].

Coreopsis tinctoria is widely grown in public and residential gardens, is grown commercially (for cut flowers), and has become widely established in the Flora area.

Coreopsis bidentata Loureiro, Fl. Cochinch. 2: 508. 1790; Bidens chinesis Willdenow; B. robertianifolia H. Léveillé & Vaniot.

Annuals. Stems erect, 30–150 cm tall, subtetragonal, loosely crisp pilose, branched in upper portion. Leaves cauli-

ean; median leaves opposite, petiole 3–5 cm, blade 9–15 cm, prominently soft pubescent on both surfaces, once or twice divided into pinnate leaflets, terminal segment ovate, shortly acuminate, rather prominently toothed, lateral segments ovate, sometimes lower one pinnatifid; upper leaves gradually smaller, opposite or alternate, bipinnately parted. Capitula radiate or discoid, 7–10 mm in diam.; peduncle 1.5–5.5 cm; phyllaries 8–10, 1-seriate, herbaceous, linear, 3–6.5 mm, acute; outer chaff calycal bracts 5–6 mm, margin hyaline. Ray florets 0–5, sterile; lamina yellow, ca. 5.5 × 2.5–3 mm, tube 1.2–1.5 mm. Disk florets bisexual, fertile; corolla 4–5.5 mm, tube 1.2–2 mm. Achenes linear, 9–19 × ca. 1 mm, compressed, 4-angled, shortly strigose; pappus awns 3 or 4, 3–4 mm. Fl. Sep.–Nov.

Roadside, waste fields; below 1300 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangxi, Liaoning, Shaanxi, Shandong, Shanxi, Taiwan, Yunnan, Zhejiang [Africa, Asia, Oceania].


金鸡菊属 jin ji ju shu

大花金鸡菊  da hua jin ji ju

Perennials, 40–60 cm. Aerial nodes proximal to first peduncle usually 6–10+ cm, upper 1–3 internodes 4–7+ cm. Leaves mostly cauline on proximal 2/3–7/8 of plant height; petioles absent or 10–35+ mm; blades usually (1 or) 2-irregularly pinnately or ± pedately lobed with (3–)5–9+ lobes, rarely simple, simple blades or terminal lobes narrowly lanceolate to linear or filiform, 15–45(–90+) × (0.5–)2–8(–12+) mm. Peduncles 8–15(–25+) cm; calycular bracts lanceolate to linear, 3.5–9+ mm; phyllaries lanceolate-ovate, 7–9(–12) mm. Ray limbs yellow, 12–25+ mm. Disk corollas 3.3–4.8 mm, apices yellow. Achenes 2–3+ mm, wings spreading, ± papyry, entire or irregularly toothed to pectinate. Fl. May–Aug. 2

Sandy soils, ditches and roadsides, other disturbed sites, granite and sandstone outcrops. Widely cultivated and naturalized in China [native to North America].


剑叶金鸡菊  jian ye jin ji ju

Perennials, 10–30(–60+) cm. Aerial nodes proximal to first peduncle usually 1–3(–5+), distalmost 1–3 internodes 1–2(–8+) cm. Leaves: basal and cauline on proximal 1/4–1/3(–1/2) of plant height; petioles 1–5(–8+) cm; blades simple or with 1 or 2+ lateral lobes, simple blades or terminal lobes ovate-lanceolate or lanceolate to oblanceolate or linear-lanceolate, 5–12 cm × 8–15(–18+) mm. Peduncles (8–)12–20(–35+) cm; calycular bracts ovate-lanceolate to linear-lanceolate or linear, 4–8(–12) mm; phyllaries deltate to dentate-lanceolate, 8–12+ mm. Ray limbs yellow, 15–30+ mm. Disk corollas 6–7.5 mm, apices yellow. Achenes 2.6–4 mm, wings ± spreading, ± papyry, entire. Fl. May–Jul. 2

Sandy soils, ditches and roadsides, other disturbed sites. Widely cultivated and naturalized in China [native to North America].


沼菊属  zhao ju shu

Herbs. Leaves opposite, sessile, entire or toothed. Capitula subsessile, solitary, terminal or axillary; phyllaries 4, leaflike; receptacle convex to conical; paleae persistent, apex glandular. Ray florets female, fertile; lamina small, apex 3- or 4-toothed. Disk florets bisexual, tubular; limbs campanulate, 5- or 6-lobed; anther tails obtuse, entire, or inconspicuously auriculate. Achenes oblong, glabrous; pappus absent.

About five species, but usually reported as ten: tropical and subtropical regions; one species in China.


沼菊  zhao ju

Herbs. Stems stout, cylindric, slightly fleshy, prostrate in lower part, 50–80 cm. Leaves subsessile, oblong or linear-oblong, 2–6 cm × 4–14 mm, both surfaces glabrous, base amplexicaul, margin sparsely serrate, apex obtuse or acute. Capitula 8–10 mm in diam.; involucre of 4 phyllaries, dorsally glabrous, outer pair larger, ovate-oblong, 10–11 mm, apex rounded; receptacle ca. 3 mm in diam.; paleae rigid, ca. 5 mm, apex toothed and sparsely pubescent. Ray florets ca. 3 mm, lamina 3- or 4-lobed in apex. Disk florets 5-lobed; stamens 5, rarely 6. Achenes obovoid-cylindric, ca. 3.5 mm. Fl. Nov–Apr.

Marshes, streamsides. Hainan, Yunnan [India, Indonesia, Malaysia, Myanmar, Thailand, Vietnam; Australia].


金钮扣属  jin niu kou shu

*Spilanthes* sect. *Acmella* (Richard) Candolle.

Herbs, annual or perennial. Leaves opposite and/or basally rosulate. Capitula solitary or in few-headed cymes, radiate, disciform, or disoid. Involucres phyllaries 1–3-seriate, subequal or with outer row spreading and longer, entire or irregularly dentate; receptacles conical; paleae falling with achene, ± navicular, membranous to scarious, each ± equaling subtended floret. Ray florets, when present, 2- or 3-lobed, variously colored. Disk florets: corolla yellow or orange, 4- or 5-lobed. Achene margin ciliate, glabrous, or sometimes corky; ray achenes broadly ovate or elliptic, 3-angled; disk achenes ellipsoid, strongly compressed; pappus absent or of up to 10 awnlike bristles. x = 13.

About 30 species: pantropical; six species (four introduced) in China.

See the monograph of *Acmella* by Jansen (Syst. Bot. Monogr. 8: 1–115. 1985). The introduction of this genus in Taiwan was detailed by S. W. Chung et al. (Taiwania 52: 276–279. 2007) and K. F. Chung et al. (Bot. Stud. 49: 73–82. 2008).

1a. Capitula radiate.

2a. Leaf blade ovate to deltate, leaf bases broadly obtuse, truncate to slightly cordate; capitula ovoid; mature achenes with obvious corklike margin ................................................................. 1. *A. ciliata*
2b. Leaf blade lanceolate, elliptic to narrowly ovate, leaf bases attenuate or cuneate; capitula cone-shaped; mature achenes without obvious corklike margin.

3a. Disk florets 4- or 5-lobed; corollas light yellow or greenish; ray florets relatively inconspicuous; phyllaries 7–11; disk floret achenes 1.5–3 mm ................................................................. 6. A. brachyglossa

3b. Disk florets 4-lobed; corollas yellow to orange; ray florets conspicuous; phyllaries 5 or 6; disk floret achenes 1.2–1.8 mm .............................................................................. 3. A. uliginosa

1b. Capitula discoid.

4a. Pappus absent; achenes glabrous ........................................................................................................ 2. A. calva

4b. Pappus of 2 or 3 setae; achenes moderately to densely ciliate.

5a. Mature achenes with corklike margin .......................................................................................... 5. A. paniculata

5b. Mature achenes without obvious corklike margin.

6a. Corollas 4-lobed; phyllaries 1-seriate; capitula 4–6 mm in diam. ............................................. 3. A. uliginosa

6b. Corollas 5-lobed; phyllaries 2- or 3-seriate; capitula > 10 mm in diam. .................................................. 4. A. oleracea


天文草  tian wen cao


Herbs, perennial, 30–80 cm tall. Stems usually decumbent to ascending, rooting at nodes, green to purple. Leaf blade ovate to broadly ovate, 2.3–7.5 × 1–5.9 cm, glabrous to sparsely pilose on both surfaces, base usually truncate or cordate, margin denticulate to coarsely dentate, apex acute. Capitula radiate, solitary or 2 or 3, terminal or axillary; peduncles 1.7–4 cm, sparsely to moderately pilose; phyllaries 7–10, 2-seriate, outer series 3–5, narrowly to broadly ovate or elliptic, 4–6.9 × 1–2.3 mm, inner series 3–6, lanceolate to ovate or elliptic, 2.8–6.1 × 1–2.9 mm; receptacle 3.8–7.4 × 0.8–1.9 mm; paleae straw-colored, 3.4–5 × 0.4–0.8 mm. Ray florets 5–10; corollas yellow-orange, 2.5–6.5 mm, tube 0.9–2 mm, lamina 1.2–4.7 × 1.1–3 mm. Disk florets 90–177, yellow-orange; corollas 5-lobed, 1.5–2 mm, tube 0.3–0.6 mm, throat 1–1.5 mm, lobes triangular, 0.2–0.4 × 0.2–0.3 mm. Achenes black, 1.4–2.2 × 0.5–1 mm, without shoulders, with obvious corklike margin, margin sparsely to moderately ciliate; pappus usually absent or sometimes of 2–4 very short subequal bristles, > 1 mm. Fl. year-round. 2n = 78.

Naturalized in Taiwan [native to South America; widely naturalized in S and SE Asia].


美形金钮扣  mei xing jin niu kou


Herbs, perennial. Stems creeping or prostrate, 20–60 cm, glabrous, rooting at nodes, sparsely pilose. Petiole 5.8–24 mm, pubescent; leaf blade lanceolate, 3–7 × 1–3 cm, abaxially subglabrous or only pubescent along veins, adaxially pubescent, base cuneate, margin peaked serrate, apex acuminate or caudate. Capitula ovoid-conical, 9–11 (–14) × 6–8 mm; peduncles 3–14 cm; phyllaries ca. 8, 2-seriate, subequal, green, ovate-oblong, 3.5–3.5 mm, margin ciliate, apex acute or obtuse; receptacle columnar-conical, 4–8 mm; paleae oblong, navicular, membranous. Corollas yellow; ray florets female, ca. 4 mm, lamina short, obovate, apex shallowly 3-lobed; disk florets bisexual, tubar, ca. 2 mm, 4–5-toothed. Achenes brown, oblong, 1.5–2 mm, pubescent or glabrous; pappus 2, arista-like. Fl. May–Dec (often flowering year-round).

Streamside, marshes, moist forest margins, fields; 1000–1900 m. Yunnan [India, Indonesia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand].


沼生金纽扣  zhai sheng jin niu kou

Spilanthes uliginosa Swartz, Prodr. 110. 1788; S. tabadicensis A. H. Moore.

Herbs, annual, 10–30 (–50) cm tall. Stems solitary or several from base, erect to ascending or occasionally decumbent, green to purple, glabrous to moderately pilose. Petiole 0.5–1.5 cm, sparsely to moderately pilose, wingless or narrowly winged; leaf blade lanceolate, narrowly ovate to ovate, 1.3–5 × 0.3–2.5 mm, glabrous to sparsely pilose on both surfaces, base attenuate to cuneate, margin sinuate to dentate, sparsely ciliate, apex acute to acuminate. Capitula radiate, solitary or 2 or 3, terminal, ovoid, 5–8 × 4–6 mm; peduncles 1.2–3 cm, sparsely pilose; receptacle 3–6 × 0.5–1 mm; paleae straw-colored or sometimes with purple tinge early in flowering, 2.5–3.5 × ca. 0.5 mm. Ray florets 4–7; corollas yellow to orange-yellow, 1.5–3.5 mm, tube 0.5–1.5 mm, lamina 3-toothed, 1.2–5 × 0.5–1.5 mm. Disk florets 68–148, yellow to orange-yellow, 4-merous; corollas 1–1.6 mm, tube 0.2–0.5 mm, throat 0.7–1.2 mm, lobes triangular, 0.2–0.3 × ca. 0.2 mm. Achenes black, 1.2–1.8 mm, moderately to densely ciliate with straight-tipped hairs; pappus of 2 subequal or unequal bristles, longer one 0.2–0.7 mm, shorter one 0.1–0.5 mm. Fl. year-round. 2n = 52.

Naturalized in Hong Kong and Taiwan [native throughout the tropics in Africa, America, and Asia; naturalized in the Pacific islands].


桂圆菊  gui yuan ju


Herbs, annual. Stems decumbent to usually erect, not rooting at nodes, green to red, glabrous. Petiole 2–6.4 cm, glabrous to very sparsely pilose, narrowly winged; leaf blade
Corollas yellow, orange, red, maroon, purple, or white. Disk florets bisexual, fertile; corollas usually yellow to reddish, sometimes campanulate, cylindric, to hemispheric; phyllaries persistent, 3- or 4-seriate; receptacle conical, paleate. Ray florets female, fertile; petals in many areas.

Cultivated in S China, including Taiwan [originating in South America and known only from cultivation, but escaped in weedy habitats in many areas].

_Acmella oleracea_ is cultivated for medicinal, insecticidal, and horticultural purposes.


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_Heliantheae_ 863

annual or perennial herbs or subshrubs. Stems prostrate or erect. Leaves cauline, opposite or subopposite, sessile or shortly petiolate; blade acerose, elliptic, linear-lanceolate, lanceolate, linear, oblong, or ovate, both surfaces hairy, usually gland-dotted, base rounded to cuneate, sheathing stem, margin entire. Syncarpous of terminal solitary capitula. Capitula usually radiate; involucres campanulate, cylindric, to hemispheric; phyllaries persistent, 3- or 4-seriate; receptacle conical, paleate. Ray florets female, fertile; corollas yellow, orange, red, maroon, purple, or white. Disk florets bisexual, fertile; corollas usually yellow to reddish, sometimes purple tinged, tubes much shorter than cylindrical throats, lobes 5, lanceolate-ovate. Achenes 3-angled or flattened, disk achenes winged; pappus absent, or persistent, of 1–3(4) awns or toothlike scales.

About 25 species: Mexico, United States; Central and South America; one species (introduced) in China.

_Zinnia angustifolia_ Kunth, _Z. elegans_ Jacquin, nom. cons. (_Z. violacea_ Cavanilles), and _Z. haageana_ Regel are cultivated in China.


Annual, mostly 30–50(–100) cm. Stems greenish, becoming purplish or yellowish, unbranched or sparingly branched distal to bases, strigose. Leaf blade ovate to elliptic or broadly lanceolate, 25–70 × 8–35 mm, 5–7-veined, scaberulous. Peduncles 10–50(–70) mm; involucres narrowly to broadly campanulate, 9–18 × 10–20 mm; phyllaries obovate to oblong, becoming scarious, glabrous, margin usually entire or erose, sometimes ciliate, apex rounded; paleae red to purple or yellow, occasionally rooting at nodes, green or red to dark purple, glabrous to moderately pilose. Petiole 5–37 mm, sparingly to moderately pilose, narrowly winged; leaf blade narrowly ovate to ovate, 1.8–10 × 0.8–6 cm, glabrous to sparsely pilose on both surfaces, base attenuate, margin sinuate to coarsely dentate, apex usually acuminate or acute. Capitula radiate, solitary, ovoid, 6.3–13 × 6.5–9.5 mm; peduncles 4–12.8 cm, sparsely pilose; receptacle 5–11 × 1–2 mm; paleae straw-colored or often with a purple-red tinge in early flowering stage, 3.5–4.6 × 0.5–0.9 mm. Ray florets 5–8; corollas pale yellow, 2–3.1 mm, tube 0.9–1.5 mm, lamina 0.5–1.7 × 0.5–1.5 mm. Disk florets 105–220, pale yellow; corollas 4–5-lobed, 1.5–2.1 mm, tube 0.4–0.7 mm, throat 1–1.5 mm, lobes triangular, 0.2–0.4 × 0.2–0.3 mm. Achenes dark brown to black, 1.8–2.3 mm, surface strigose, margin densely ciliate with straight-tipped hairs, without obvious corklike margin; pappus of 2 subequal bristles, longer one 0.5–1.1 mm, shorter one 0.3–1 mm. Fl. Mar–Oct. 2n = 52, 60, 78.

Widely cultivated and naturalized in Taiwan [a weedy species in the Caribbean and Central and South America].
margin erose or subentire, apex obtuse. Ray florets 6–15(–21); corollas usually scarlet red or maroon, sometimes yellow, lamina linear to spatulate, 8–25 mm. Disk florets 12–50; corollas yellow, 5–6 mm, lobes ca. 1 mm. Achenes 7–10 mm, ray achenes 3-angled, disk achenes compressed, ribbed, setuliferous; pappus usually of 1 stout awn 4–6 mm. Fl. Jun–Nov, fr. Jul–Nov. 2n = 24.

Roadsides, grasslands, mountain slopes; below 1300 m. Introduced and naturalized in Gansu, Hebei, Henan, Sichuan, Yunnan [probably native to Mexico, but widespread in South America].


羽芒菊属 yu mang ju shu

Herbs, annual or perennial. Leaves opposite, petiolate or sessile; blade delamate, lanceolate, lanceolate-ovate, or ovate, often pinnately or palmately lobed, both surfaces glabrate, hirsute, scaberulose, or strigillose, ultimate margin coarsely toothed to subentire. Synflorescence of solitary capitula or cymose. Capitula radiate or discoid; involucres cylindric to hemispheric, 4–8 mm in diam.; phyllaries persistent, in 2 or 3+ series, outer usually shorter, more herbaceous, inner often scarious; receptacle convex to conical; paleae persistent, lanceolate-linear, scarious, weakly conduplicate, often apically toothed. Ray florets female, fertile; lamina pale yellow, white, or purplish. Disk florets bisexual, fertile; corollas yellowish, whitish, or purplish, tubes shorter than cylindric or funnelform throats, lobes 5, usually delulate, sometimes corollas of marginal florets bilabiate. Achenes obconical to obpyramidal, 3–5-angled, densely pilose-sericeous, glabrous, or villous; pappus persistent, of plumose or ciliate, setiform scales or bristles, rarely absent. x = 10.

About 26 species: tropical America and Asia; one species (introduced) in China.


羽芒菊 yu mang ju

Herbs, annual to perennial, caulescent, decumbent. Stems procumbent, branched at base, branches slender, spreading or ascending, 20–50 cm, hirsute. Leaves few, shortly petiolate; blade ovate to ovate-lanceolate, 2.5–5 cm, base cuneate, margin deeply irregularly serrate, pinnatisect, segments few, narrow, apex acute or acuminate. Capitula solitary, 1–1.5 cm in diam.; peduncle 10–30 cm; involucre subcampanulate, 6–7 mm; phyl-


牛膝菊属 niu xi ju shu

Annuals, 2–62 cm. Stems erect. Leaves cauline, opposite, petiolate; blade lanceolate to broadly ovate, surfaces glabrate to densely pilose, 3-veined, margin entire or serrate to serrate. Synflorescence cymose. Capitula radiate or discoid; involucres hemispheric to campanulate, 2.5–6 mm in diam.; phyllaries persistent or deciduous, 6–9[–16], in 2[or 3] series, elliptic, ovate-lanceolate, oblong, or ovate, outer shorter, herbaceous or scarious, margin entire or minutely laciniate; receptacles conical, paleaceous, palea persistent or deciduous, scarious, proximal broadly elliptic to obovate, often connate at bases or nearly to apices, united in groups of 2 or 3 to adjacent proximal phyllary, each complex often enclosing and shed with a ray achene, distal persistent or deciduous, lanceolate to obovate, entire or 2- or 3-lobed, convexus to conduplicate. Ray florets 1–3–5(–8)[–15], female, fertile; corollas white or dull white to pinkish [or purplish], tubes pilose, lamina quadrate-ovate to oblong, lobes 0–3. Disk florets 5–50[–150], bisexual, fertile; corollas yellow, tubes shorter than cylindric throats, pilose, 5-lobed, deltate; anthers yellow; style branch apices acute. Achenes obconical to obpyramidal, glabrous or strigose, ray achenes often shed with subtending phyllary plus 2 or 3 adjacent paleae; pappus absent or of (1–)14–20 white or gray, persistent, fimbriate, sometimes aristate, scales. x = 8.

About 15–33 species: Caribbean to Bermuda, Central, North, and South America; two species (both introduced) in China.


1a. Phyllaries persistent, usually glabrous; inner palea 3-lobed, lobes 1/3+ total lengths, acute; disk pappus absent or of 15–20 often gray, sometimes white, linear, fimbriate, obtuse scales 0.5–2 mm ................................................ 1. G parviflora

1b. Phyllaries deciduous, usually with some stipitate glands; inner palea entire or 2- or 3-lobed, lobes to 1/3 total lengths, blunt; disk pappus absent or of 1–5 or 14–20 white, lanceolate to oblanceolate, fimbriate, sometimes aristate, scales ................................................................. 2. G quadriradiata
1. **Galinsoga parviflora** Cavanilles, Icon. 3: 41. 1795.

牛膝菊 niu xi ju

Plants 4–60 cm. Leaf blade 7–110 × 3–70(–80) mm. Peduncles 1–40 mm; involucres campanulate, 2.5–5 mm in diam.; phyllaries persistent; outer paleae with distal inner phyllaries or deciduous, elliptic to obovate, inner usually persistent, lanceolate to ovate or obovate, 2–3.5 mm, 3-lobed, lobes to 1/3+ total lengths, acute. Ray florets (3–)5(–8); corollas usually dull white or pink, lamina 0.5–1.8 × 0.7–1.5 mm. Disk florets 15–50. Ray achenes 1.5–2.5 mm; pappus absent or of 5–10 laciniate scales 0.5–1 mm; disk achenes 1.3–2.5 mm, glabrous or strigose; pappus absent or of 15–20, rarely 1–5, white, lanceolate to oblanceolate, fimbriate, sometimes aristate, scales 0.2–1.7 mm. Fl. Jul–Oct. 2n = 16.

Fields, streamsides, sparse forests. A common weed widely distributed in China [native to South America].


粗毛牛膝菊 cu mao niu xi ju

Adventina ciliata (Rafinesque) S. F. Blake.

Plants 8–62 cm. Leaf blade 20–60 × 15–45 mm. Peduncles 5–20 mm; involucres hemispheric to campanulate, 3–6 mm in diam.; phyllaries deciduous, outer paleae deciduous, broadly elliptic to ovate, 2–3 mm, inner deciduous, linear to lanceolate, 2–3 mm, entire or 2- or 3-lobed, lobes to 1/3 total lengths, blunt. Ray florets (4 or)5(–8); corollas usually white, sometimes pink, lamina 0.9–2.5 × 0.9–2 mm. Disk florets 15–35. Ray achenes 1.5–2 mm; pappus of 6–15 fimbriate scales 0.5–1 mm; disk achenes 1.3–1.8 mm, pappus absent or of usually 14–20; rarely 1–5, white, lanceolate to oblanceolate, fimbriate, sometimes aristate, scales 0.2–1.7 mm. Fl. Jul–Oct. 2n = 32, 48, 64.

Forests, roadsides. Jiangxi; recently naturalized in Taiwan [native to C Mexico but widespread naturally in South America]. The occurrence of this species in Taiwan was first reported by C. I. Peng et al. (Taiwania 43: 320–329. 1998).


刺苞果属 ci bao guo shu

Annuals. Leaves cauline, opposite, petiolate or sessile; blade mostly elliptic to deltate, rhombic, or ovate, sometimes lyrate, both surfaces usually pilosulose to sericeous or scaberulose, sometimes glabrescent, usually gland-dotted, ultimate margin entire or toothed. Capitula radiate, 1(–3) in axils of leaves or in forks of branches; involucres hemispheric; phyllaries persistent (outer) or deciduous, 10–13, 2-seriate. Ray florets 5–8, female, fertile; corollas yellowish, tube shorter than to equaling lamina, lamina ovate to elliptic or linear. Disk florets 3–8(–12), functionally male; corollas yellowish, tubes shorter than funnelform or campanulate throats, lobes 5, deltate. Achenes each enclosed within and shed with an often hardened, prickly bur; pappus absent. x = 11.

About six species: mostly tropical to warm-temperate New World; one species (introduced) in China.

1. **Acanthospermum hispidum** Candolle, Prodr. 5: 522. 1836.

刺苞果 ci bao guo

Annual herbs, coarse, erect, to 1.3 m tall. Stems poorly branched, hispid. Leaves sessile or shortly petiolate; blade oblong or obovate, 10–100 × 5–40 mm, both surfaces hispid and gland-dotted, margin subentire and repand- or coarsely dentate. Capitula ± sessile. Achenes compressed and wedge-shaped, narrowing toward base, 5–6 mm with 2 divergent terminal spines 4–5 mm, straight or somewhat hooked; fruit body covered with shorter, hooked spines. Fl. Jun–Jul, fr. Aug–Oct.

A weed of streamsides, roadsides, and waste slopes; below 1900 m. Guangdong, Yunnan [native to South America; naturalized elsewhere].

In FRPS (75: 333. 1979) the name *Acanthospermum australe* (Loefling) Kuntze was misapplied to *A. hispidum*. True *A. australe* differs by having stems ascending or procumbent, capitula mostly pedunculate, and achenes oblong-fusiform and ribbed, with uniform-length hooked spines throughout. No Chinese material agreeing with *A. australe* has been seen by the present authors.


小葵子属 xiao kui zi shu

Annuals, perennials, subshrubs, or shrubs. Stems erect or creeping, branched. Leaves mostly cauline, opposite, sessile; blade rhombic to lanceolate or obovate, both surfaces glabrous or puberulent to pilose, gland-dotted at least abaxially, margin entire or serrate. Synflorescence corymbose or of solitary capitula. Capitula radiate; involucres campanulate or hemispheric; phyllaries persistent, 10–13, 2-seriate; receptacle conical to hemispheric; paleae oblong to lanceolate, membranous to scarious. Ray florets 6–18, female, fertile; corollas yellow. Disk florets numerous, bisexual, fertile; corollas yellow, tubes cylindric, hairy, shorter than campanulate throats, 5-lobed, deltate. Achenes weakly compressed, 3- or 4-angled, glabrous; pappus absent. x = 15.

Six species: Africa; one species (introduced) in China.


小葵子 小葵子


Annuals. Stems 30–50 cm to 1–2 m tall, subglabrous, ± pilose above. Leaves sessile (lower petiolate), oblong-ovate to lanceolate, ± shortly hairy abaxially, especially along veins, glabrous axially, base semiamplexicaul, apex acuminate. Capitula 2–6 cm in diam., on long or sometimes short pubescent peduncles; outer phyllaries leaflike, ovate, herbaceous, inner narrower; pappus absent. Ray florets with short tube and 3-lobed lamina, pubescent or only at base of lamina and in lower part. Disk florets tubular, pubescent as in ray florets, 5-lobed. Outer achenes triquetrous, inner ± 4-angled, 3–6 × 1.5–3 mm, obpyramidal, in transverse section subrhombic or triangular, brown or black, with thin pericarp.

Cultivated in Fujian, Sichuan, and Yunnan [native to Africa (N Ethiopia); naturalized in India].

This species, originating in the Ethiopian highlands, is grown for its edible oil and seed.


豨莶属 豨莶属

Herbs, annual. Leaves opposite, petiolate, densely pubescent. Synflorescence of small terminal and axillary usually many-headed corymbs. Capitula pedunculate; involucre 2-seriate, campanulate; outer phyllaries 5, longer than inner, linear-spatulate, divaricate, with thick glandular hairs; receptacle flat with scarious paleae, enveloping achenes. Corollas yellow, marginal florets uniseriate, shortly limbed, female; disk florets tubular, bisexual. Achenes elongate-obovate, 4-angled, apex truncate; pappus absent. x = 15.

About four species; tropical and subtropical areas; three species in China.


1a. Branches forked in upper part; leaves papery, irregularly lobulate ................................................................. 1. *S. orientalis*

1b. Branches not forked; leaves thinly membranous, usually toothed.

2a. Stems and both surfaces of leaves uniformly soft pubescent; peduncle not glandular; achenes ca. 2 mm ...... 2. *S. glabrescens*

2b. Stems and lower surfaces of leaves densely white pubescent; peduncle usually glandular pilose; achenes 2.5–3.5 mm .............................................................................................................................................. 3. *S. pubescens*


豨莶 猪莶

*Sigesbeckia brachiata* Roxburgh; *S. caspia* Fischer & C. A. Meyer; *S. esquirili* L. Léveillé & Vaniot; *S. gracilis* Candolle; *S. humilis* Koidzumi; *S. iberica* Willdenow; *S. microcephala* Candolle; *S. orientalis* var. *caspia* (Fischer & C. A. Meyer) Grossheim.

Annuals. Stems erect, simple or dichotomously branched, branches opposite, obtusely angled, 30–75(–100) cm tall, ± divaricate, with thick glandular hairs; receptacle flat with scarious paleae, enveloping achenes. Corollas yellow, marginal florets uniseriate, shortly limbed, female; disk florets tubular, bisexual. Achenes elongate-obovate, 4-angled, apex truncate; pappus absent.

About four species; tropical and subtropical areas; three species in China.


毛梗豨莶 毛梗豨莶


Annuals. Stems 35–100 cm tall, shortly appressed pilose. Median cauline leaves with winged petiole, blade ovate-deltate, 5–13 × 3.5–11 cm, irregularly toothed, upper surface slightly pubescent; upper leaves sessile, oblong; uppermost leaves linear. Capitula radiate, ca. 12 mm wide; peduncle 1–3 cm, densely shortly pubescent; phyllaries spatulate, densely glandular pilose. Ray limb 1.5–2.5 mm, 3-toothed, tube 0.5–1 mm, pilose; disk corolla ca. 1.5 mm, 3-toothed, tube ca. 0.5 mm, densely pilose. Achenes ca. 2 mm. Fl. Apr.–Sep., fr. Jun.–Sep. 2n = 30.

Roadsides, fields, thickets; 300–2500 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Korea].


腺梗豨莶 腺梗豨莶


包果菊属 bao guo ju shu

Perennials, annuals, or shrubs, 1–3(–12) m tall. Stems erect. Leaves caulescent, opposite, petiolate (petioles usually winged) or sessile; blade usually deltate to ovate, usually palmately lobed, both surfaces hirtellous, pilosulose, or puberulent, gland-dotted (at least abaxially), ultimate margin dentate to denticulate. Capitula radiate, borne singly or 2–5 in crowded, corymbose arrays; involucres hemispheric, 8–15 mm in diam.; phyllaries persistent, 12 or 13(–25) in 2 series, herbaceous, inner as many as ray florets, more membranaceous to scarious, narrower and shorter. Receptacles flat to convex, paleate, paleae obovate to spatulate, scarious. Ray florets 7–13(–25+), female, fertile; corollas yellow, white, or orange, tubes hairy, lamina linear to elliptic or ovate. Disk florets (20–)40–80(–150), functionally male; corollas yellow or orange, tubes shorter than abruptly campanulate or funnelform throats, lobes 5, deltate. Achenes obliquely inserted on receptacle, each shed separately from subtending phyllary, obovoid [or quadrangular], somewhat compressed, finely 30–40-ribbed or -striate, not narrowed at bases, not apically beaked; pappus absent (achenes sometimes hairy at apices). x = 16.

About 23 species: Central, North, and South America; two species (both introduced) in China.


1a. Leaf blade usually lobed; underground stems without tubers .............................................................. 1. S. uvedalia
1b. Leaf blade unlobed; underground stems tuberous .................................................................................... 2. S. sonchifolius


包果菊 bao guo ju

Osteospermum uvedalia Linnaeus, Sp. Pl. 2: 923. 1753; Polymnia uvedalia (Linnaeus) Linnaeus.

Herbs, perennial, 1–3 m tall. Stems cylindric and hollow; underground part irregularly branched, often producing spindle-shaped tubers 100–200 mm and 30–80 mm in diam. Lower leaves broadly ovate and hastate or subhastate, connate and auriculate at base; upper leaves ovate-lanceolate, without lobes and hastate base; upper and lower surfaces densely pubescent. Synflorescence terminal, composed of 1–5 branches, each one with 3 capitula; peduncles densely pilose; corollas 5, 1-seriate, ovate. Corollas yellow to bright orange; ray florets female, 2- or 3-toothed, depending on clone, lamina ca. 12 × 7 mm; disk florets male, ca. 7 mm. Immature achenes purple, turning dark brown or black at maturity. Fl. Jun–Aug(–Oct). 2n = 32.

Thickets, fields. Naturalized in Anhui and Jiangsu [native to Central and North America].

Known as yellow-flowered leaf-cup, this species is primarily a weed of pastures, hay fields, hedgerows, and roadsides in North America.


Annuals. Stems 60–120 cm tall, densely white pubescent, especially on upper part. Median cauline leaves ovate to deltate-ovate, 7–19 × 6–18 cm, short appressed pubescence on both surfaces, veins on lower surface densely white pubescent. Capitula radiate, ca. 20 mm wide; peduncle 15–35 mm, densely glandular pilose; phyllaries linear, rounded at apex, glandular pilose at base. Ray limbus ca. 3.5 mm, shallowly 2- or 3-toothed, tubic ca. 1.5 mm; disk corolla 2–2.5 mm, 5-toothed, tube 0.5–1 mm, pilose. Achenes 2.5–3.5 mm. Fl. May–Aug, fr. Jun–Oct. 2n = 30.

Mountain slopes, forest margins, thickets, grasslands; below 3400 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jilin, Liaoning, Jiangsu, Jiangxi, Nei Mongol, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [India, Japan, Korea].
brous or pubescent, apex truncate, of female florets 3-ribbed, dorsally compressed, of bisexual florets 3- or 4-ribbed, or laterally compressed; pappus 2–5, unequal, spinelike or squamalike, base connate.

About ten species: tropics; one species in China.


百能葳 bai neng wei


Herbs, annual. Stems erect, 40–60 cm tall, branched. Lower leaves opposite, with up to 1 cm petioles, blade ovate to ovate-lanceolate, 3–6 × 2–3 cm, both surfaces scabrid, base cuneate, margin sparsely serrate, apex acuminate; upper leaves smaller, usually alternate, ovate to ovate-oblong, 2–3 × 1.3–1.5 cm, base usually rounded. Capitula axillary or terminal, ca. 1 cm in diam.; peduncles slender, 15–40 mm, with spreading hairs; phyllaries 2-seriate, outer papery, green, ovate-oblong, ca. 6 mm, dorsally densely hairy, apex shortly acute or obtuse, inner ovate to oblong-linear, ca. 5 mm, sparsely pubescent, apex acute; palea oblong-lanceolate, ca. 5 mm, dorsally pubescent, apex aristiform. Ray florets 1-seriate, yellow or yellowish white, lamina ca. 3 mm, apex 2–4-toothed. Disk florets campanulate, limbs 5-toothed. Achenes densely pubescent, those in female florets 3-angled, ca. 4 mm, those in bisexual florets compressed, ca. 5 mm; pappus short, unequal, 2–5. Fl. Apr–Jun.

Open broad-leaved forests, grassy slopes; below 2600 m. Hainan, Sichuan, Yunnan [India, Indonesia, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam; Africa, Australia, South America].


金腰箭属 jin yao jian shu

*Ucacou* Adanson.

Herbs, annual. Stems erect or ascending. Leaves opposite, petiolate. Capitula radiate, sessile or subsessile, in axillary glomerules or borne singly; involucres cylindric to campanulate; phyllaries persistent, 2–5+, 1(or 2)-seriate; receptacle convex, paleate. Ray florets 1- or 2-seriate, female, fertile; corollas yellowish. Disk florets bisexual, fertile; corollas yellowish, tubes ± equaling slightly ampliate cylindric throats, 4-lobed, orbicular-deltate. Achenes dimorphic, strongly obcompressed or flattened, narrowly oval and winged or linear-cuneate and wingless; pappus of 2 triangular scales (ray) or 2 or 3 subulate scales or awns (disk), persistent.

One species: Caribbean, Central and South America, Mexico; introduced in Africa, Asia, Australia, and Pacific islands, including China.


金腰箭 jin yao jian

*Verbesina nodiflora* Linnaeus, Cent. Pl. 1: 28. 1755.

Annuals, 10–80 cm tall. Stems erect or ascending, branched from bases or ± throughout. Leaves cauline, opposite, petiolate; blade ovate to elliptic, 3–10 × 2–5 cm, both surfaces ± scabrid, usually 3-veined, base cuneate to rounded, margin toothed. Capitula radiate, sessile or subsessile in axillary glomerules or capitula solitary; involucres cylindric to campanulate, 3–6 mm in diam.; phyllaries persistent, 2–5+, 1(or 2)-seriate; receptacle convex, paleate. Ray florets 1- or 2-seriate, female, fertile; corollas yellowish. Disk florets bisexual, fertile; corollas yellowish, tubes ± equaling slightly enlarged cylindric throats, 4-lobed, orbicular-deltate. Achenes oblanceolate-obconical, dorsiventrally compressed, tuberculate or smooth; pappus of 2 stout awns.

Fl. year-round. 2n = 40.

Fields, wastelands, roadsides. Guangdong, Hainan, Taiwan, Yunnan [pantropical weed of South American origin].


金腰箭舅属 jin yao jian jiu shu

Herbs, annual or perennial, small, usually procumbent or prostrate. Leaves opposite, petiolate, margin crenate-serrate. Capitula solitary or in small dense clusters, radiate; phyllaries ca. 5; receptacle with flat or concave paleae. Ray florets 5–8, female, yellow. Disk florets 4- or 5-lobed, yellow. Achenes oblanceolate-obconical, dorsiventrally compressed, tuberculate or smooth; pappus of 2 stout awns.

Three species: South to North America; one species (introduced) in China.


金腰箭舅 jin yao jian jiu

Herbs, perennial. Stems prostrate, branched, rooting at nodes, densely appressed strigillose. Petiole 3–8 mm, narrowly winged toward blade, margin ciliate; leaf blade ovate to broadly
ovate, to 35 × 25 mm, both surfaces densely appressed strigillose, base attenuate, margin crenate-serrate, apex acute, apiculate. Capitula axillary, solitary, subsessile; peduncle to 15 mm; involucre narrowly oblong-oblancoceolate, 6–7 × 2.5–3.5 mm; phyllaries 4, 2-seriate, concave, lanceolate, 6–7 × 3–3.5 mm, apex acuminiform and apiculate; paleae hyaline, narrowly elliptic, 3.5–4.8 × 0.8–1 mm. Ray florets 3–8; corolla 4.5–6.2 × 1.4–1.8 mm, 3-toothed; achenes oblanceolate, 3.5–4 × 1.7–2 mm; pappus of 2 ascending divergent awns, 1.2–2.4 mm. Disk florets 3–8; corolla 2.6–3.6 mm, apex 2- or 3-toothed or entire, densely papilliform within; achenes similar to those of ray florets but slightly narrower and thicker, sometimes 3-angled, 1.1–1.7 mm wide, evidently muricate. 2n = 24.

Naturalized weed of roadsides. Taiwan [native to Cuba, Mexico, and United States].


**离药金腰箭属** *li yao jin yao jian shu*

Herbs, annual. Stems erect or sprawling. Leaves opposite, petiolate; blade ovate to trullate, 3-veined. Capitula axillary, solitary, nodding, discoid; involucre campanulate; phyllaries 2- or 3-seriate, herbaceous; receptacles flat, paleaceous; paleae partly involute around outer florets. Florets bisexual, corollas yellow; anthers free, not united into a cylinder, black or golden brown; style branches tapered, apices papilliform. Achenes compressed, quadrate to terete, tuberculate; pappus a small apical peg.

Two species: Neotropics, one widely adventive in the Old World; one species (introduced) in China.


**离药金腰箭** *li yao jin yao jian*


Herbs, erect, to 30 cm. Stems glabrate to pilose. Petiole 1–2 cm; leaf blade ovate, 3(–8) cm, 3-veined from near base, both surfaces pubescent and glandular, base obtuse, acute, or acuminate, margin entire or crenulate-dentate, apex acuminiform or acuminate. Synflorescence terminal, of 2–5 capitula; peduncles slender, pilose, usually longer than capitulum. Capitula discoid, 4–6 mm; phyllaries 2-seriate, outer slightly imbricate, ovate, abaxially pubescent toward base, margin ciliolate, apex acuminate or acute, inner paleaceous and involute around florets. Florets 2–6, ca. 2.5 mm; anthers black; style branches lanceolate, pubescent abaxially. Achenes brown, ca. 3 mm, 3-angled, body tuberculate, sparsely setuliferous; pappus an apical peg.

Recently naturalized in Taiwan [widespread in Central and South America but also found in W Africa and Australia].

The occurrence of this species in Taiwan was first reported by Sheng Z. Yang and G. P. Hsieh (*Taiwania* 51: 46–49. 2006).

### 222. ECLIPTA Linnaeus, Mant. Pl. 2: 157, 286. 1771, nom. cons.

**鳢肠属** *li chang shu*

*Eupatoriophalacron* Miller.

Herbs, annual or perennial, erect, branched, strigose. Leaves opposite, toothed. Capitula terminal on stems and branches or axillary, pedunculate, heterogamous; involucre campanulate; phyllaries imbricate, ca. 2-seriate; receptacle flat or convex, paleaceous; paleae awnlike. Ray florets bisexual, corollas yellow; anthers free, not united into a cylinder, black or golden brown; style branches tapered, apices papilliform. Achenes compressed, quadrate to terete, tuberculate; pappus a small apical peg.

About five species: mostly warm-temperate to tropical New World, introduced in Old World; one species (introduced) in China.


**鳢肠** *li chang*


Herbs, annual. Stems erect, ascending or prostrate, to 60(–100) cm tall, strigose-pilose, branched at base. Leaves lanceolate, 3–10 × 0.5–2.5 cm, papery, densely strigose-pubescent on both surfaces, base narrowed, sessile or shortly petiolate, margin serrulate, apex gradually acuminate. Capitula ca. 6 mm wide; peduncle slender, 2–4.5 cm; involucre globose-campanulate, ca. 5 × 6–7 mm, enlarging to 11 mm wide in fruit; phyllaries 5 or 6, 2-seriate, oblong, acute, outer longer. Ray florets 2-seriate; lamina 2.5–3 × ca. 0.4 mm, bidentate or entire. Disk florets many; corolla ca. 1.5 mm, 4-lobed. Achenes ca. 2.8 × 1.5 mm, margin ribbed. Fl. Jun–Aug.

Riversides, fields, abandoned ponds, roadsides; below 1600 m. Anhui, Fujian, Gansu, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [native to Central, North, and South America; introduced in Africa, Asia, Australia, Europe, and Pacific islands].

苏利南野菊属 su li nan ye ju

_Bailliona _Aublet; _Trixis _Swartz (1788), not P. Browne (1756); _Oswalda _Cassini; _Orsinia _Bertoloni ex Candolle; _Trichapium _Gilli.

Shrubs or small trees. Leaves opposite, sessile or petiolate; blade lanceolate to broadly cordate, 3-veined, leathery. Synflorescence of terminal lax or congested panicles or coryumbs, sometimes of glomerule-like cymes. Capitula disciform; involucres cylindrical, campanulate, or hemispheric; phyllaries 2-6-seriate, subequal, imbricate, membranous, scarious, inner enclosing marginal achenes, greenish to purple, sometimes white; receptacles flat to shallowly convex, usually paleaceous; paleae subtending female florets resembling inner phyllaries, ovate or orbicular, 3-9-veined, paleae subtending disk florets membranous, lanceolate, 1-3-veined, margin remotely ciliate. Marginal florets female, 1(or 2)-seriate; corollas inconspicuous, white, greenish white, or yellowish white, 2-5-lobed. Disk florets functionality male; corollas white or greenish white, 4- or 5-lobed; anther black, anther appendage with anther thecae and anther appendages blackish. Achenes obcompressed, obovoid to obpyriform, sometimes drupelike, glabrous to variously setuliferous, especially at apices; pappus absent. x = 16.

About 24 species: Neotropics; one species (introduced) in China.


苏利南野菊 su li nan ye ju

_Bailliona _aspera _Aublet; _Clibadium _asperum _(Aublet) _Candolle; _C. _caracasum _Candolle; _C. _lanceolatum _Rusby; _C. _lehnmannianum _O. _E. _Schulz; _C. _surinamense _Linnaeus var. _macrophylllum _Steyermark; _C. _trinitatis _Candolle; _C. _villosum _Benth; _Oswalda _baillierioides _Cassini; _Trixis _aspera _(Aublet) _Swartz.

Shrubs, 1.5–4(–5) m. Stems hispidulous to scabrid. Leaves petiolate; petiole 1.5–5 cm; blade lanceolate to broadly ovate, 5–12(–20) × 2–6(–12) cm, both surfaces hispidulous, base obtuse, margin serrate, or serrate-dentate, apex acute to acuminate. Synflorescence thyrsoid or paniculiform. Capitula sessile; phyllaries 3 or 4, leathery, broadly ovate, 5-veined, apex acute. Female florets 3–5; paleae ovate, ca. 4 × 3–4 mm, 5-veined. Disk florets 10–14; corolla ca. 3 mm, 4-lobed. Achenes ca. 2.5 × 2 mm, setuliferous in upper half.

Recently naturalized in Taiwan [native to and widely distributed in Central and South America; introduced in Indian Ocean islands (Mauritius) and Indonesia (Borneo, Java, Sumatra)].

The occurrence of this species in Taiwan was first reported by Y. H. Tseng et al. (Taiwania 53: 103–106. 2008).


膨蜞菊属 peng qi ju shu


Herbs, perennial, procumbent. Stems stout, glabrous or pubescent, seldom scabrid. Leaves opposite, somewhat succulent; petiole distinct but less than 5 mm; blade elliptic or lanceolate, to 18 cm, often with triangular lobes and conspicuous marginal teeth, glabrous or sparsely pubescent, sometimes scabrid, base cuneate, apex acute. Capitula solitary on elongate peduncle, radiate; involucres green; phyllaries lanceolate, 10–15 mm, cili-
ate, obscurely veined, innermost narrower. Ray florets 4–8, showy, yellow, 15–20 mm, 3- or 4-denticulate, fertile. Disk florets numerous, yellow, ca. 2 cm; corolla 5–6 mm. Achenes blackish, sometimes mottled, clavate, angled, ca. 5 mm; pappus of fused scales, coroniform.

Cultivated as an ornamental ground cover and escaped in many countries, occasionally naturalized on slopes and along roadways at lower elevations. Guangdong, Taiwan [native to the New World tropics but widespread in the Old World tropics].


卤地菊 peng qi ju

Verbesina calendulacea Linnaeus, Sp. Pl. 2: 902. 1753; Complaya chinensis (Osbeck) Strother; Jaegeria calendulacea (Linnaeus) Sprengel; Seranum calendulaceum (Linnaeus) Kuntze; Solidago chinensis Osbeck; Thelechitonias chinesis (Osbeck) H. Robinson & Cuatrecasas; Wedelia calendulacea (Linnaeus) Lessing (1832), not Richard (1807); W. chinensis (Osbeck) Merrill.

Stems prostrate with ascending tips, elongate, rooting from lower nodes, appressed pilose. Leaves sessile or shortly petiolate; blade linear-oblong to lanceolate, 2–10 cm × 6–20 mm, papery, appressed pilose on both surfaces, base narrowed, margins sparsely mucronulate-errulate, apex acute. Capitula 2–2.5 cm wide, solitary on erect branches; peduncle 6–12 cm; involucre hemispheric, 8–9 mm; phyllaries 5, subequal in length, 1-seriate, oblong, shortly appressed pubescent, apex acute or sometimes obtuse. Ray florets 1-seriate, yellow; corolla 9–11 × 3–3.5 mm, 2- or 3-dentate. Disk corolla 4–4.5 mm, 5-lobed. Achenes obovoid, ca. 3.5 × 1.5–2 mm, coarsely hairy at tip; pappus vase- or cup-shaped. Fl. Mar.–Sep.

Paddy ridges, in grassy fields and moist lowland depressions in the north, also common in littoral areas. Fujian, Guangdong, Lian-ning, Taiwan [India, Indonesia, Japan, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam].


卤地菊属 lu di ju shu

Perennial herbs or weak shrubs. Leaves opposite, slightly fleshy. Synflorescence terminal, of solitary capitula or corymbose. Capitula radiate; involucre 2-seriate; paleae strongly veined. Ray florets female. Disk florets bisexual. Achenes of ray florets obconical, 3-angled, those of disk florets obconical, 4-angled; pappus absent or of 1 short awn.

About 20 species: Africa, Asia, Central, North, and South America, Pacific islands; one species in China.


卤地菊 lu di ju


Stems long creeping, rooting at nodes, coarsely hirsute; flowering branches ascending, leafy, densely strigose. Cauline leaves with 2–8 mm petiole, oblong, sometimes ovate or lanceolate, thickly leathery, coarsely strigose on both surfaces, 3-veined, base cuneate, margin loosely dentate, apex acute. Capitula 5–22 × 16–22 mm, usually solitary, terminal; peduncle 1–7 cm; involucre hemispheric, 10–12 × 5–6 mm; phyllaries 1-seriate, ovate to ovate-oblong, 2–3.5 mm wide, coarsely strigose, apex acute to obtuse. Ray corollas yellow, 8–11 × 4 mm. Disk corollas tubular, 5–6 mm, 5-lobed. Achenes 3.5–4 × 2 mm, apically striigillate, 3- or 4-angled; pappus bristles 1 or 2, or obsolete. 2n = 30.

Littoral sand dunes, sandy seashores. Guangdong, Taiwan [Japan, Korea, Thailand, Vietnam].

Wagner and Robinson (Brittonia 53: 557. 2001) noted that “Melanthera prostrata var. robusta Makino” (a combination that does not exist) is thought to represent a hybrid between M. prostrata and M. biflora (here treated as Wollastonia biflora), q.v. C. I Peng et al. (Fl. Taiwan, ed. 2, 4: 1094, 1097. 1998, as Wedelia prostrata var. robusta). This is not recognized here, q.v. Wagner and Robinson (loc. cit.).


李花菊属 luan hua ju shu

Perennial herbs or weak shrubs. Leaves opposite; blade ovate, 3-veined. Synflorescence of solitary terminal capitula or open panicle in cymes. Capitula radiate; involucre hemispheric to campanulate; phyllaries 2-seriate; receptacle convex. Ray florets female; lamina yellow. Disk florets bisexual; corollas yellowish or greenish yellow; anthers brown to black. Ray achenes cuneiform, 3-angled, base setuliferous, apex truncate. Disk achenes compressed and obscurely 4-angled, base setuliferous; pappus absent or usually a single awn.

Probably two species: Indo-Pacific coastal region and montane areas; two species in China.


1a. Capitula usually (1 or)3–6, 20–30 mm in diam.; stems scendent ................................................................. 1. W. biflora
1b. Capitula always solitary, ca. 15 mm in diam.; stems erect ........................................................................... 2. W. montana

李花菊 luan hua ju


Subshrubs or somewhat woody herbs. Stems elongate, branched, scendent, coarsely appressed strigose. Cauline leaves long petiolate; petiole 1.2–2.3 cm; blade ovate, 7–14 × 3–8 cm, thickly papery, appressed strigose, base rounded, margin ser- long petiolate; petiole 1.2–2.3 cm; blade ovate, 7–14 × 3–8 cm, thickly papery, appressed strigose, base rounded, margin ser- long petiolate; petiole 1.2–2.3 cm; blade ovate, 7–14 × 3–8 cm, thickly papery, appressed strigose, base rounded, margin ser-


*Verbesina montana* Blume, Bijdr. 911. 1826; *Wedelia montana* (Blume) Boerlage; *W. montana* var. *pilosa* H. Koyama; *W. montana* var. *wallichii* (Lessing) H. Koyama; *W. urticifolia* Candolle; *W. urticifolia* var. *wallichii* (Lessing) Candolle; *W. wallichii* Lessing.

Perennial herbs. Stems erect, stout, glabrous or scabrid. Leaves petiolate; petiole 1–2 cm; blade ovate or ovate-lanceolate, (3–)5–9 × (1–)3–4 cm, both surfaces scabrid, base rounded or cuneate, margin crenulate, apex acuminate. Capitula ca. 15 mm in diam., solitary on elongate peduncle; involucre campanulate, 7–10 × 4–5 mm; outer phyllaries papery, green, oblong, ca. 10 mm, dorsally scabrid, apex obtuse or shortly acute, inner phyllaries oblong to lanceolate, ca. 7 mm, dorsally pubescent in upper part, apex acuminate; paleae oblong, sparsely pubescent. Ray florets 1-serial, yellow; lamina oblong, 4–6 × ca. 2 mm, apex 2- or 3-toothed. Disk florets tubular, yellow. Achenes red-brown, obvoid-trigonous, slightly compressed, ca. 5 mm; pappus elements 2 or 3. Fl. Apr–Oct.

Streamsides, roadsides; 500–1200(–3000) m. Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Yunnan [Bhutan, India, Myanmar, Nepal, Thailand].

Two taxa are represented among the material cited by Candolle under *Wollastonia montana*. That representing Blume’s concept of *Verbesina montana* certainly does not belong to *Melanthera*, and it is felt better to include it here within the concept of *Wollastonia*. It should also be noted that *Wedelia wallichii* var. *megalantha* is not conspecific with type material of *W. wallichii* but appears to be *Wollastonia biflora*.


硬果菊属 ying guo ju shu

Annuals, perennials, or subshrubs. Stems sprawling to erect, branched. Leaves mostly cauline, opposite (proximal) or alternate, petiolate [or sessile]; blade ovate to rhombic or lanceolate, both surfaces glabrous or ± scabrid, 3-veined, base cuneate to rounded, margin coarsely toothed. Capitula radiate, solitary; involucres rotate to hemispheric, 12–20 mm in diam.; phyllaries persistent, 5–8(–21), 1(or 2)-seriate; receptacle low conical; paleae each closely investing subtended floret, each forming a hard perigynium around fruit and shed with it. Ray florets 5–8, neuter; corolla pubescent. Achenes weakly compressed, glabrous, obliquely obvoid or arcuate; pappus absent, or coroniform of distinct or connate scales or bristles. n = 12.

About 12 species: mainly in Mexico, United States, and Central America, one species in tropical Africa and Asia; one species (introduced) in China.


硬果菊 ying guo ju

Herbs. Annual. Stems 25–50[–120] cm tall, white hirsute. Leaves opposite, alternate in upper part; blade ovate, 3.5–7 × 1.5–2 cm, both surfaces scabrid, base decurrent to petiole, margin serrate, apex acute or obtuse. Capitula solitary, 8–12 mm in diam.; involucre campanulate; outer phyllaries ovate, ca. 1 cm, apex acuminate, inner ovate-oblong, shorter than outer, abaxially densely tomentose. Ray florets 1-seriate; lamina broadly elliptic, apex 2-lobed. Disk florets puberulent. Achenes oblong; pappus coroniform, of distinct or connate scales.

Naturalized in Xizang [native to tropical Africa and Asia].
228. LAGASCEA Cavanilles, Anales Ci. Nat. 6: 331. 1803 [“Lagasca”], nom. cons.

Annual herbs or perennial shrubs. Stems terete, glabrous to pilose and often stipitate glandular. Leaves opposite, petiolar or sessile; blade ovate to oblanceolate, subglabrous to sericeous abaxially, subglabrous to strigose adaxially, base obtuse to subacute, margin obscurely to markedly serrate, apex acute to acuminate. Synflorescence globose to campanulate, of 1-flowered (rarely 2- or 3-flowered) capitula aggregated secondarily, sometimes to third degree, solitary, cymose, or racemose clusters; receptacle convex; secondary phyllaries separate, herbaceous, lanceolate to obovate, abaxially subglabrous to pilose and sometimes stipitate glandular; primary phyllaries laterally connate into an involucral tube, abaxially subglabrous to densely pilose, with 1–3 rows of resinous glands, apices acute to acuminate and sometimes stipitate glandular. Florets bisexual; corollas yellow, white, pink, or red, narrowly funnelform, lobes 5; anthers yellow, tan, brown, black, pink, or red; style bifid, style branches tapering toward apices. Achenes brown to black, narrowly cylindric to obovoid, minutely grooved, glabrous or setuliferous; pappus an erose pubescent crown or of short pubescent awns.

About nine species: mainly in Mexico and Central America, one species is a widespread pantropic weed; one species (introduced) in China.


1. Lagascea mollis Cavanilles, Anales Ci. Nat. 6: 332. 1803.

Herbs, annual, to 1 m tall, rarely perennial, creeping or straggling, to 90 cm tall or long, sometimes rooting at nodes, sometimes mat-forming. Stems sometimes purplish, with stipitate glandular hairs on young parts. Leaves opposite; petiole 5–27 mm; blade narrowly ovate or ovate, 1–7 × 0.5–4 cm, shortly pubescent to slightly sebriulose, 3–5-veined from base, base obtuse to attenuate, margin subentire to serrate, apex acute to acuminate. Glomerules solitary and terminal, campanulate, 8–13 × 8–30 mm, with 8–25 1-flowered capitula; subtending bracts lanceolate to obovate, 5–15 × 1–6 mm; involucre of capitula 4–5 × ca. 1 mm, stipitate glandular. Florets white or with blue tinge, 4–5 mm. Achenes brown or black, ca. 3 mm, setuliferous near apex; pappus a minute crown, pubescent; achene usually surrounded by connate phyllaries topped by scales, 2–2.5 mm.

Hong Kong [probably native to Central America; widespread throughout the tropics].


金光菊属 jin guang ju shu

Annuals, biennials, or perennials. Leaves alternate, rarely opposite; blade ovate to broadly ovate, unlobed or pinnatifid, rarely sessile and cordate. Capitula in terminal, paniculiform cymes, radiate, rarely discoid; involucre flat to reflexed, rarely hemispheric; phyllaries persistent, in 1 or 2 (or 3) series; receptacle conical to columnar; paleae scarious, conduplicate or concave, ± enclosing florets. Ray florets neuter; corolla golden to lemon-yellow, orange, or reddish, or bicolored. Disk florets: corolla yellow to purplish, blue tinge, 4–5 mm. Achenes brown or black, ca. 3 mm, setuliferous near apex; pappus a minute crown, pubescent; achene usually surrounded by connate phyllaries topped by scales, 2–2.5 mm.

About 17 species: North America; two species (both introduced) in China.


1a. Leaf blades usually 1- or 2-pinnatifid or pinnately lobed, glabrous or hairy; disk corollas yellow to yellowish green

1b. Leaf blades entire or serrate, with coarse stiff hairs; disk corollas yellowish green, distally brown-purple


金光菊 jin guang ju

Perennials, 50–200 cm tall. Leaves green; blade broadly ovate to lanceolate, all but distalmost ones 1- or 2-pinnatifid or pinnately compound; leaflets or lobes 3–11, glabrous or hairy, base cuneate to attenuate or cordate, margin entire or dentate, apex acute to acuminate; basal leaves petiolate, 15–50 × 10–25 cm; cauline leaves petiolate or sessile, mostly lobed to pinnatifid, sometimes not lobed, 8–40 × 3–20 cm. Capitula 2–25 in loose, corymbiform arrays; phyllaries 8–15, ovate to lanceolate, glabrous or hairy, margin mostly ciliate; receptacle hemispheric or ovoid to globose; paleae 3–7 mm, abaxially densely hairy at apex, apex truncate or rounded. Ray florets 8–12; corolla limb elliptic to oblanceolate, 15–50 × 4–14 mm, abaxially hairy. Disk 0.9–3 × 1–2.3 cm; disk florets numerous; corolla yellow to yellowish green, 3.5–5 mm; style branches 1–1.5 mm, apex acute to rounded. Achenes 3–4.5 mm; pappus coroniform or of 4 scales, to 1.5 mm. Fl. Jul–Sep.

Widely cultivated and naturalized in China [native to North America].


黑心菊 hei xin ju

Annuals, biennials, or perennials. Stems hispid to hirsute. Leaf blade elliptic, lanceolate, or ovate, hispid to hirsute, base attenuate to cuneate, margin entire or serrate, apex acute; basal leaves petiolate, 8–30 × 0.5–7 cm; cauline leaves petiolate or sessile, blade 3–20 × 0.4–4 cm. Capitula solitary or 2–5 in loose, corymbiform arrays; phyllaries to 3 cm; receptacle
hemispheric to ovoid; paleae 4–6 mm, abaxially hirsute to hirsute at apex, apex acute, often attenuate. Ray florets 8–16; corolla limb usually uniformly yellow to yellow-orange or with a basal maroon splotch, sometimes mostly maroon, elliptic to oblong or oblanceolate, 15–45 × 5–10 mm, abaxially hirsute to hirsute. Disk 1.2–2.2 × 1–2 cm; disk florets numerous; corolla proximally yellowish green, distally brown-purple, 3–4.2 mm; style branches ca. 1.5 mm, apex subulate. Achenes 1.5–2.7 mm; pappus absent. Fl. Jun–Sep.

Widely cultivated and naturalized in China [native to North America].

_Rudbeckia bicolor_ Nuttall is listed in some Chinese floras; it is now treated as a synonym of _R. hirta var. pulcherrima_ Farwell.

### 230. _TITHONIA_ Desfontaines ex Jussieu, Gen. Pl. 189. 1789.

**肿柄菊属 zhong bing ju shu**

Annuals, perennials, subshrubs, or shrubs. Stems erect, branched. Leaves all or mostly cauline, opposite (proximal) or mostly alternate, petiolate or sessile; blade mostly deltate or pentagonal, sometimes 3- or 5-lobed, often 1 or 5-veined, both surfaces glabrous, ± hirsute, pilose, soft pubescent, or villous, often gland-dotted, base truncate or auriculate, ultimate margin serrate to crenate. Capitula borne singly; peduncles usually distally dilated, fistulose; involucres usually hemispheric to hemispheric; phyllaries persistent, in 2 or 3+ series, usually entire or serrate, rarely lobed. Synflorescence of solitary capitula or of corymbs, panicles, or spikes. Capitula usually radiate 

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<th>1a. Disk florets numerous, bisexual, fertile; corollas yellow or orange</th>
<th>1. <em>H. argophyllus</em> L.</th>
<th>1. <em>H. argophyllus</em> L.</th>
<th>1. <em>H. argophyllus</em> L.</th>
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About 11 species: Mexico, SW United States; Central America; one species (introduced) in China.


_Tithonia rotundifolia_ (Miller) S. F. Blake is cultivated in China.


**肿柄菊 zhong bing ju**


Perennials, subshrubs, or shrubs, to 250(–500) cm. Petiole 2–6 cm; blade ± deltate to pentagonal, 7–33 × 7–22 cm, sometimes 3- or 5-lobed, abaxially glabrous to hirsute-pilose. Peduncles 7–24 cm; phyllaries 16–28, (3 or)4-seriate, oblong to ovate, outer phyllaries 6–10 × 4–7 mm, abaxially usually glabrous, apex rounded to acute, inner 10–20 × 3–10 mm, abaxially glabrous, apex rounded to acute; paleae 10–13 × 2–3 mm, mucros 1.5–2.5 mm. Ray florets 7–14; corollas yellow, lamina linear, 48–69 × 9–16 mm. Disk florets 80–120+. Achenes 4–6 mm. Fl. Sep–Jan. 2n = 34.

Introduced and naturalized in Guangdong, Taiwan, and Yunnan [native to Mexico].

**231. HELIANTHUS** Linnaeus, Sp. Pl. 2: 904. 1753.

**向日葵属 xiang ri kui shu**

Annuals or perennials. Stems erect or ascending to decumbent or procumbent, usually branched distally. Leaves basal and/or cauline, opposite (proximal) or mostly alternate, petiolate or sessile; blade mostly deltate, linear-lanceolate, lanceolate, ovate-lanceolate, linear, or ovate, both surfaces glabrous or hairy, often gland-dotted, base cordate to narrowly cuneate, margin usually entire or serrate, rarely lobed. Synflorescence of solitary capitula or of corymbes, panicles, or spikes. Capitula usually radiate or sometimes discoid; involucres usually hemispheric, sometimes campanulate or cylindric; phyllaries persistent, in 2 or 3+ series, subequal to unequal; receptacle flat to slightly convex or conic; paleae conduplicate, usually rectangular-oblong, usually 3-toothed, sometimes entire, apices sometimes reddish or purplish. Ray florets usually 5–30, rarely 0, neuter; corollas usually yellow. Disk florets bisexual, fertile; corollas yellow or reddish, tubes shorter than campanulate throats, lobes 5, triangular. Achenes compressed or flattened, sometimes subulate to aristate. x = 17.

About 52 species: North America; three species (all introduced) in China.


1a. Capitula large, 10–30 cm in diam.; disk florets brown or purple ........................................ 1. _H. annuus_ 1b. Capitula small, 2–5 cm in diam.; disk florets yellow or reddish.

2a. Rootstock tuberous; perennial herbs; disk floret corollas yellow; leaves gland-dotted abaxially .......................... 3. _H. tuberosus_ 2b. Rootstock entirely fibrous; annual or perennial herbs; disk floret corollas usually reddish; leaves not gland-dotted abaxially .............................................................. 2. _H. debilis_

向日葵 xiang ri kui


Annuals, 100–300 cm. Stems erect, usually hispid. Leaves mostly cauline, mostly alternate; petiole 2–20 cm; blade ovate-lanceolate to ovate, 10–40 × 5–40 cm, abaxially usually ± hispid, sometimes gland-dotted, base cuneate to subcordate or cordate, margin serrate. Capitula 1–9; peduncles 2–20 cm; involucres hemispheric or broader, 15–40(–200) mm in diam.; phyllaries 20–30(–100), ovate to ovate-lanceolate, 13–25 × (3–)5–8 mm, abaxially usually hirsute to hispid, rarely glabrate or gland-dotted, base cuneate to subcordate or cordate, margin usually ciliate, apex ± toothed. Capitula 3–15; peduncles 2–3.5 mm plus 0–4 obtuse scales 0.5–1 mm. Fl. Jul–Sep. fr. Aug–Oct. 2n = 34.

Open areas. Widely cultivated in China [native to North America].

*Helianthus annuus* is a major agronomic crop, introduced nearly worldwide.


瓜叶葵 gua ye kui

*Helianthus cucumerifolius* Torrey & A. Gray, Fl. N. Amer. 2: 319. 1842.

Herbs, annual or perennial, 40–200 cm. Stems erect, gland-dotted; hirsute, sometimes glaucous. Leaves mostly cauline, opposite or alternate proximally, usually alternate distally; petiole 2–8 cm, often ± winged; blade lanceolate to ovate, 10–23 × 7–15 cm, 3-veined from near base, abaxially puberulent or hisptulous to tomentulose and gland-dotted or ± scabrid, base broadly to narrowly cuneate, margin entire or serrate. Capitula 3–15; peduncles 1–15 cm; involucres hemispheric, 10–25 mm in diam.; phyllaries often dark green, drying nearly black, 22–35, subequal, lanceolate, 8.5–15 × 2–4 mm, abaxially hirsute, gland-dotted, base appressed, margin ciliate, apex ± spreading, sometimes reflexed in fruit, acuminate; paleae 8–9 mm, 3-toothed, apices hairy. Ray florets 10–20; lamina 25–40 mm. Disk florets 60+; corollas 6–7 mm, lobes yellow; anthers dark brown or black, appendages dark or yellowish. Achenes 5–7 mm, glabrous or apically hairy; pappus of 2 aristate scales 0.5–0.8 mm. Fl. Aug–Sep. fr. Aug–Oct. 2n = 102.

Roadside, fields, wastelands. Widely cultivated and sometimes naturalized in China [native to North America; widely cultivated in temperate areas].

*Helianthus tuberosus* is a vegetable crop and widely naturalized.


苍耳属 cang er shu

Annuals. Stems erect, branched. Leaves cauline, mostly alternate (proximal 2–6 sometimes opposite), petiolate; blade lanceolate, linear, ovate, orbicular-deltate, or suborbicular, often palmately or pinnately lobed, both surfaces hirtellous or ± strigose, usually gland-dotted as well, ultimate margin entire or ± toothed. Capitula discoid, either female (proximal) or functionally male (distal), in racemiform to spiciform arrays or borne singly (in axils). Female capitula: involucres ± ellipsoid, 2–5 mm in diam. at anthesis; phyllaries 6–12 series, outer 5–8 distinct, remainder (sometimes interpreted as paleae) proximally connate, their distinct tips mostly ± hooked (distal 1–3 usually longer, stouter, and not hooked), whole becoming a hard, prickly perigynium (a bur); florets 2, corollas 0. Male capitula: involucres saucer-shaped, 3–5 mm in diam.; phyllaries in 1 or 2 series, distinct to bases; receptacle conical to columnar; paleae spatulate to cuneiform or linear, membranous, apically villous or hirtellous; florets 20–50, corollas whitish, funnelform, lobes 5, erect or reflexed; filaments connate, anthers free or weakly coherent. Achenes black, fusiform, enclosed in obovoid to ellipsoid, hard, prickly, 2-chambered burs; pappus absent. x = 18.

刺苍耳

Acanthoxanthium spinosum (Linnaeus) Fourr.-Xanthium cloessplateaum

Herbs, annual, 10–60(–120) cm; nodal spines usually in pairs, simple or 2- or 3-partite, 15–30 mm. Petiole 1–15(–25) mm; leaf blade ± ovate to lanceolate or lanceolate-linear, 4–8(–12) × 1–3(–5) cm, often pinnately 3(–7)-lobed, abaxially gray to white, densely strigose. Burs 10–12(–15) mm. Fl. Jul–Aug, fr. Sep–Oct. 2n = 36.

Damp or seasonally wet alkaline soils, wastelands, margins of agricultural land. Beijing, Henan [native to North and South America].

The synonymy of Xanthium spinosum is far more extensive than is indicated here. Xanthium ambrosioides Hooker & Arnott is sometimes included within the synonymy of this species. It is, however, a very distinctive taxon from Argentina (Patagonia) that should perhaps be recognized as a separate species.


苍耳

Xanthium americanum Walter; X. chaisei Femald; X. chinense Miller; X. curvescens Millspaugh & Sherff; X. cylindricum Millspaugh & Sherff; X. echinatum Murray; X. echinellum Greene ex Rydberg; X. globosum C. Shull; X. inaequilateratum Candolle; X. indicum J. Koennig ex Roxburgh var. inaequilateratum (Candolle) Miquel; X. inflexum Mackenzie & Bush; X. italicum Moretti; X. japonicum Widder; X. mongolicum Kitagawa; X. orientale Linnaeus; X. oviforme Wallroth; X. pensylvanicum Wallroth; X. sibiricum Patrin ex Widder; X. sibiricum var. jingyuanense H. G. Hou & Y. T. Lu; X. sibiricum var. subinermis Widder; X. speciosum Kearney; X. strumarium var. canadense (Miller) Torrey & A. Gray; X. strumarium var. glabratum (Candolle) Cronquist; X. strumarium var. japonicum (Widder) H. Hara; X. strumarium subsp. sibiricum (Patrin ex Widder) Greuter; X. varians Greene; X. wootonii Cockerell.

Herbs, annual, 20–120 cm; nodal spines absent. Petiole 3.5–10 cm, not winged; median cauline leaves ovate-deltate, 9–25 cm, papery, densely scabrid on both surfaces, base shallowly cordate to broadly cuneate, margin irregularly dentate, often obsolescent 3-lobed, apex acute. Capitula monoeocious. Male capitula in terminal umbels; phyllaries 1-seriate, oblong-lanceolate, ca. 2.2 mm; outer paleae oblong-lanceolate, inner paleae lanceolate, ca. 2.2 mm; corolla white, tubular, ca. 2.5 cm, 5-dentate. Female capitula axillary; phyllaries 1-seriate, oblong-lanceolate, ca. 3 mm, inner bracts connate with outer paleae. Burs sessile, oblong, ellipsoid, or ovoid, 10–18 ×6–12 mm, densely puberulent, 2-beaked. Fl. Jul–Aug. Fr. Sep–Oct. 2n = 36.

Damp or seasonally wet often alkaline soils, wastelands, margins of agriculture, common weed. Anhui, Fujian, Guangdong, Guangxi, Hainan, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [a pantropical weed, known to be widely distributed in both Old and New Worlds, but most probably originating in the New World].


豚草属

Annuals, perennials, or shrubs. Stems erect, decumbent, or prostrate, branched. Leaves usually cauline, opposite throughout or opposite (proximal) and alternate or mostly alternate, sessile or petiole; blade deltate, elliptic, filiform, lanceolate, linear, obovate, ovate, or rhombic, usually pinnately, sometimes palmately, lobed, both surfaces hairy or glabrate, usually gland-dotted or stipitate glandular, ultimate margin entire or toothed. Capitula discoid, unisexual, female proximal to or intermixed with male, male capitula usually arranged in racemes or spikes; rarely single plants all or mostly male or female. Female capitula: phyllaries 1–8-seriate, outer 1(–5)–8 distinct or connate, herbaceous, remainder connate, usually with free tips forming tubercles, spines, or wings; florets 1(–5); corollas 0. Male capitula: involucres cup-shaped to saucer-shaped, 1.5–6 mm in diam.; phyllaries 1-seriate, connate; receptacle flat or convex; paleae spatulate to linear, membranous, sometimes villous, hirtellous, and/or gland-dotted or stipitate glandular, sometimes absent; florets 5–60; corollas whitish or purplish, funnelform, 5-lobed, erect or incurved; staminal filaments connate, anthers free or weakly coherent. Achenes black, ovoid or fusiform, enclosed within globose to obovoid, pyramidal, pyriform, obconical, or fusiform, hard, smooth, tuberculate, spiny, or winged burs; pappus absent. x = 18.

About 43 species: tropical to subtropical and temperate New World, mostly North America; three species (all introduced) in China.


1a. Leaves palmmate 3–5-lobed, sometimes undivided ......................................................... 2. A. trifida

1b. Leaves once or more commonly twice pinnatifid/pinnatisect.

2a. Annuals; involucres of male capitula 2–3 mm in diam.; burs 2–3 mm; male florets 12–20 .................. 1. A. artemisiifolia

2b. Perennials; involucres of male capitula 3–5 mm in diam.; burs 3–4 mm; male florets 15–25 .............. 3. A. psilostachya

豚草 tun cao

*Ambrosia artemisiifolia* var. *elatior* (Linnaeus) Descourtilz; *A. elatior* Linnaeus.

Annuals, 20–150 cm. Stems erect. Leaves opposite and alternate; petiole 2.5–3.5(–6) cm; blade deltate to lanceolate or elliptic, 2.5–5.5(–9) × 2–3(–5) cm, pinnately 1– or 2-lobed, abaxially sparsely pilosulous to strigillose, adaxially strigillose, both surfaces gland-dotted, base cuneate, ultimate margin entire or toothed. Female capitula clustered, proximal to male; floret 1. Male capitula: peduncles 0.5–1.5 mm; involucres shallowly cup-shaped (usually without black veins), 2–3 mm in diam., glabrous or hispid to pilosulous; florets 12–20. Burs ± globose to pyriform, 2–3 mm, ± pilosulose, spines or tubercles 3–5, near middle or apex, conical to acerose, 0.1–0.5 mm, tips straight. Fl. Jul–Oct, fr. Sep–Oct. 2n = 34, 36.

Introduced noxious weed of wet to dry soils; below 1000 m. Widely distributed in China [native to Central and North America; introduced and widely distributed in Asia and Europe].


三裂叶豚草 san lie ye tun cao

Annuals, 30–150 cm. Stems erect. Leaves mostly opposite; petiole 10–30(–70) mm; blade orbicular-deltate to ovate or elliptic, 4–15(–25) × 3–7(–20) cm, usually some palmately 3–(5)-lobed, both surfaces scaberulose and gland-dotted, base truncate to cuneate, sometimes decurrent onto petiole, margin usually toothed, rarely entire. Female capitula clustered, proximal to male; floret 1. Male capitula: peduncles 1–3 mm; involucres saucer-shaped, 2–4 mm in diam., scaberulose; florets 3–25. Bur pyramidal, 3–5(–7) mm, glabrous or glabrate, spines 4 or 5, apical, acerose, 0.5–1 mm, tips straight. Fl. Jul–Aug, fr. Sep–Nov. 2n = 24, 48.

Weed of disturbed sites, wastelands, damp soils; below 1600 m. Hebei, Heilongjiang, Hunan, Jiangxi, Jilin, Liaoning, Shandong, Sichuan, Zhejiang [native to North America].


裸穗豚草 luo sui tun cao

*Ambrosia coronopifolia* Torrey & A. Gray.

Herbs, perennials, to 75(–100) cm tall. Stems leafy, glabrescent below, simple or with ascending branches from above middle. Leaves opposite below, alternate on branches, petiolar below, upper sessile; petiole 1–3 cm; blade ovate in outline, 4–10 × (2–)4–9 cm, 1 or 2 times pinnatisect, large segments 2–4 cm, divergent or ascending, linear or elliptic-oblong, central rachis 2–6 mm wide. Synflorescences terminal, spiciform, 10–20 cm × ca. 10 mm, usually surrounded by smaller secondary spikes terminating axillary branches, spike primarily of 50–100 male capitula. Male capitula: involucres cup-shaped or turbinate, 3–5 mm in diam.; paleae filiform, apices expanded and pubescent; florets 15–25; corollas pale yellow or greenish yellow, 2–2.5 mm; anthers white, inflexed-subulate, bases obtuse. Female capitula few and inconspicuous, solitary or 2–5 together in sessile leafy-bracteate axillary clusters on nodes beneath male part of spike; floret 1. Bur ± obovoid, 3–4 mm (including beak), 2–3 mm wide including blunt spines, spines 0.5–0.8 mm and thick, body rounded and coarsely reticulate above spines, beak tapering, 0.7–1 mm.

Recently naturalized in Taiwan [native to temperate North America and parts of South America].

The occurrence of this species in Taiwan was first reported by Y. H. Tseng and C. I Peng (Endemic Sp. Res. 6: 71–74. 2004).

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银胶菊属 yin jiao ju shu

Annuals, biennials, perennials, subshrubs, or shrubs. Stems erect, usually branched. Leaves usually cauline, sometimes in rosettes, alternate, petiolate or sessile; blade elliptic, lanceolate, linear, oblanceolate, obovate, ovate, orbicular-deltate, or spatulate, sometimes pinnately (1 or)2-lobed, both surfaces usually hairy and gland-dotted (at least abaxial), ultimate margin entire or toothed. Capitula usually radiate, sometimes ± disciform; involucres hemispheric; phyllaries deciduous, 2-seriate, outer 5(–8) herbaaceous to scarious, inner 5–8 scarious to membranous; receptacle flat to conical; paleae cuneate to flabelliform, scarious or membranous, distally papillate and/or fimbriate, all or peripheral each ± enfolding a disk floret. Ray female florets 5(–8), fertile; corollas ochroleucous, tubes stout, glandular. Disk florets functionally male; corollas ochroleucous, funnelform, lobes 5. Achenes oblancoate, obovate, or pyriform, often obcompressed; pappus absent. x = 9.

About 16 species: North America to South America, including the Caribbean; one species (introduced) in China.

*Parthenium argentatum* A. Gray is cultivated in China.


银胶菊 yin jiao ju

Herbs, annual, 30–120 cm tall. Leaf blade ovate to elliptic, 3–18 × 1–5(–9) cm, pinnately (1 or)2-lobed, ultimate lobes lanceolate to linear, 3–50 × 2–15 mm, both surfaces sparsely to densely scaberulose and gland-dotted. Synflorescences of open panicles. Capitula obscurely radiate; peduncles 1–8(–15+)+ mm; outer phyllaries 5(or 6), elliptic-lanceolate, 2–4 mm, inner 5(or 6) ovate to orbicular, 2.5–4 mm. Female florets 5(or 6); corolla limbs reniform or orbicular to oblong, 0.3–1 mm. Disk florets 12–30(–60). Achenes obvoid, 1.5–2(–3.5) mm; pappuslike enations erect, deltate to ovate, 0.5–1 mm. Fl. Apr–Aug. 2n = 34.

Fields, roadsides; below 1500 m. Guangdong, Guangxi, Guizhou, Yunnan [native to tropical America; a widely introduced weed in the tropics].
235. GAILLARDIA Fougeroux, Observ. Phys. 29: 55. 1786 [“Gaillarda”].

天人菊属 tian ren ju shu

Annuals, perennials, or subshrubs. Stems usually erect, usually branched. Leaves petiolate or sessile; leaf blade entire to pinnatifid, sometimes semisucculent. Capitula terminal or axillary, solitary, radiate or discoid; involucre hemispheric to broadly hemispheric; phyllaries persistent, in 2 or 3 or more series, subequal, herbaceous or papery; receptacle convex to hemispheric, densely setose. Ray florets usually neuter, rarely female and fertile or styliferous and sterile; corolla yellow to white or orange to red, purplish, or brown, often bicolored. Disc florets bisexual, fertile; corolla yellow or orange to red, purplish, or brown; tube much shorter than throat; throat ampullate, campanulate to cylindric, or urceolate; lobes 5, broadly deltate or ovate. Achenes obpyramidal to clavate, sparsely to densely hairy; pappus usually persistent, of 6–12 medially thickened, laterally scarious scales in 1 or 2 series, rarely of linear scales with erose margins.

Twenty species: North and South America; one species (introduced) in China.


Gaillardia amblyodon J. Gay and G. aristata Pursh are cultivated in China.


天人菊 tian ren ju

Herbs, annual, 10–60 cm. Leaves cauline, sessile to sub-sessile; blade linear, oblong, or spatulate, 5–10 cm × 4–12(−35) mm, densely strigillose or hirtellous to ± villous, margin usually entire, sometimes toothed or lobed. Phyllaries 18–28, narrowly triangular-attenuate to linear-attenuate, 6–14 mm, margin usually ciliate with jointed hairs. Receptacular setae 1.5–3 mm.

Ray florets usually 8–14; corolla usually reddish to purplish proximally, yellow to orange distally, rarely yellow, reddish, or purplish throughout, 13–30 mm. Disk florets numerous; corolla yellowish to purple or brown, often bicolored; tube 0.8–1.2 mm; throat campanulate to urceolate, 3–4 mm; lobes deltate to ovate, often attenuate. Achenes obpyramidal, 2–2.5 mm; hairs 1.5–2 mm, inserted at base and on angles; pappus of 7 or 8 deltate to lanceolate, aristate scales 4–7 mm. Fl. May–Aug. 2n = 34.

Widely cultivated and naturalized in China [native to North America].
1b. Capitula disciform, heterogamous or homogamous; marginal florets filiform or tubular; achenes without large glabrous or hairy, often glandular, hairs not myxogenic; pappus persistent, of ± barbellate bristles, of bristles and short scales, of short capitula, usually ellipsoid or columnar to prismatic, rarely with short beak, but sometimes abruptly constricted distally, often ribbed, truncate, sterile apical appendage absent. Anthers with radial or polarized endothecial tissue. Achenes usually monomorphic within below bifurcation, branches ± linear, adaxially stigmatic in 2 lines from bases to apices (lines confluent distally), apices rounded to truncate, sterile apical appendage absent. Anthers with radial or polarized endothecial tissue. Achenes usually monomorphic within capitula, usually ellipsoid or columnar to prismatic, rarely with short beak, but sometimes abruptly constricted distally, often ribbed, glabrous or hairy, often glandular, hairs not myxogenic; pappus persistent, of ± barbellate bristles, of bristles and short scales, of short scales only, or rarely missing.

About 60 genera and 600 species: nearly worldwide, in both Old and New Worlds; 14 genera (one introduced) and 92 species (16 endemic, four introduced) in China.

1a. Capitula radiate, disciform, or discoid, florets yellow; marginal florets when present female, radiate (rarely miniradiate or tubular); disk florets bisexual; phyllaries herbaceous or leathery, sometimes leafy; achenes with large oxalate crystals in epidermis cells (subtribe Inulinae).

2a. Receptacle with paleae; style branch apex of bisexual florets rounded or truncate ...................................... 187. Buphthalmum

2b. Receptacle without paleae; style branch apex of bisexual florets broad, rounded.

3a. Pappus absent ................................................................................................................................................... 188. Carpesium

3b. Pappus present.

4a. Pappus in 2 rows, inner row of barbellate bristles, outer row of short, membranous scales ................. 189. Pulicaria

4b. Pappus all of barbellate bristles.

5a. Pappus bristles very few, sometimes missing in ray florets ................................................................. 190. Pentanema

5b. Pappus bristles numerous; all florets with pappus.

6a. Marginal florets filiform, tubular .......................................................... 191. Blumea

6b. Marginal florets radiate or missing.

7a. Ray florets 2- or 3-seriate, lamina 10–45 mm, rarely shorter; anther appendage rounded to acute; endothecial tissue radiate ............................................................... 192. Inula

7b. Ray florets 1-seriate, lamina 1–15 mm; anther appendage truncate; endothecial tissue polarized .......................................................... 193. Duhaldea

1b. Capitula disciform, heterogamous or homogamous; marginal florets filiform or tubular; achenes without large epidermis crystals (subtribe Plucheinae).

8a. Capitula in dense globose or elongated secondary capitula.

9a. Pappus absent ............................................................................................................................................... 194. Sphaeranthus

9b. Pappus present ....................................................................................................................................... 195. Pterocephalon

8b. Capitula solitary, or in sparse compound synflorescence.

10a. Pappus absent ............................................................................................................................................. 196. Epaltes

10b. Pappus of capillary bristles.

11a. Phyllaries broad, oval to lanceolate; perennial herbs, subshrubs, or shrubs.

12a. Involucre obovate, broadly campanulate, or hemispheric; herbs, subshrubs, or shrubs ............. 197. Plucheia

12b. Involucre oblong; perennial herbs ........................................................................................................... 198. Karelinia

11b. Phyllaries narrow, linear-lanceolate or lanceolate; annual or perennial herbs.

13a. Stem generally winged; anthers without tails ......................................................................................... 199. Laggera

13b. Stem not winged; anthers shortly tailed at base ....................................................................................... 200. Psococonyza


牛眼菊属 niu yan ju shu

Herbs, perennial. Stem not winged, with resin canals. Leaves alternate, sessile or petiolate, lanceolate to rhombic, entire or dentate, glabrescent or hairy. Capitula heterogamous, radiate, solitary, terminal. Receptacle paleate, paleae folded, subtending florets. Involucre hemispheric; phyllaries in 2 or 3 rows, narrowly linear, herbaceous, not subtended by leaves. Marginal florets female, in 1
row; corolla yellow, radiate. Achenes triquetrous to flattened. Pappus missing or a rim of scales. Disk florets bisexual; corolla yellow; epidermis with straight cell walls, without needlelike crystals; corolla lobes short, smooth. Anthers calcareous with very short tails; endothecial tissue polarized. Cells of antheropodium wider than long. Pollen spines with a cavity. Style branches with acute sweeping hairs not reaching furcation. Achenes flattened or somewhat triquetrous, shorter than corolla; epidermis with elongated crystals. Pappus of a rim of irregularly incised scales. \( x = 10 \).

Three species: Europe; one species (introduced) in China.

1. **Buphthalmum salicifolium** Linnaeus, Sp. Pl. 2: 904. 1753.

牛眼菊  niu yan ju

Herbs, perennial, 50–70 cm tall. Stems erect, purplish red, usually not branched or branched at upper part, pubescent or subglabrous. Lower leaves obovate-lanceolate, base gradually narrower and petiolate; middle leaves oblong to lanceolate, base gradually narrower, apex acute; upper leaves smaller, lanceolate narrower and petiolate; middle leaves oblong to lanceolate, base subglabrous. Lower leaves obovate-lanceolate, base gradually narrower and petiolate; middle leaves oblong to lanceolate, base subglabrous, surfaces pubescent, base gradually nar-

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Three species: Europe; one species (introduced) in China.

*Carpesium atkinsonianum* Hemsley.

Herbs, perennial. Stems 25–150 cm tall, densely pubescent, branched above middle. Lower leaves thin, petiolate; petiole shorter than or as long as blade, shortly winged; blade ovate to ovate-oblong, 7–23 cm, pubescent on surfaces, abaxially pale and gland-dotted, adaxially green, base mostly rounded, sometimes shallowly cordate or truncate, rarely shortly cuneate, margin irregularly mucronulate-dentate, apex acute to obtuse; median leaves oblong, cuneate-attenuate at base, acuminate at apex; upper leaves much smaller, oblong or oblong-lanceolate, sessile. Capitula 6–8 mm in diam., terminal and solitary on branches or in subascemose synflorescences, nodding at anthesis, subtending bracteal leaves 2–4, lanceolate, reflexed, 2–5 × as long as head. Involucre ovoid, 6–8 × 5–6 mm; phyllaries 4-serial, imbricate, outermost shortest, broadly ovate, cuspidate, herbaceous, median oblong, rounded, innermost linear, obtuse. Corolla of marginal florets cylindric, ca. 1.5 mm, 4-lobed; corolla of disk florets cylindric, 3–3.5 mm, limb 5-lobed. Achenes cylindric, ca. 3.5 mm. Fl. Jul–Oct, fr. Oct–Nov. 2n = 40.

Broad-leaved forests, mixed forests; 600–1600 m. Anhui, Fujian, Guangdong, Guizhou, Henan, Hubei, Hunan, Jiangxi, Jilin, Liaoning, Sichuan, Taiwan, Zhejiang [Japan, Korea].

2. **Carpesium trachelifolium** Lessing, Linnaea 6: 233. 1831.

*Carpe
cium cernuum* (Les
ing) C. B. Clarke.

Stems 30–50 cm tall, usually sparsely pubescent. Leaves ovate, 4–15 × 2–8 cm, sparsely pubescent on surfaces, with subsessile glands abaxially, base usually acuminate to attenuate, margin subintere to coarsely serrate; lower leaves broadly (rarely narrowly) petiolate; upper ones sessile or shortly petiolate. Capitula 1–8 in racemes or spikes at branch ends, suberect to pendulous, 2–10 mm in diam., surrounded by leaflike bracts 4.5–37 × 2–9 mm. Involucre 4- or 5-serial; phyllaries mostly oblong, to 3.5–5.2 mm, scarious, obtuse, outer ones sometimes shorter or herbaceous above or ovate and rounded to acuminate at apex. Dis
k florets: corollas ca. 2 mm, tube glabrous or hairy. Achenes ca. 3 mm, narrowed above to glandular apex. Fl. Jul–Aug, fr. Sep–Oct.

Valleys, forests; 2000–3500 m. Sichuan, Taiwan, Xizang, Yunnan [Bhutan, India, Kashmir, Nepal].

13a. Cauline leaves semiamplexicaul; plants tomentose-pilose; corolla sparsely pubescent .......... 13. *C. velutinum*

13b. Cauline leaves petiolate or sessile, base not amplexicaul; corolla densely pubescent.

14a. Bracteal leaves and outer phyllaries spatulate or linear-spatulate, apex rounded or obtuse, densely pubescent ............................................................. 14. *C. scapiforme*

14b. Bracteal leaves and outer phyllaries lanceolate, apex acuminate, sparsely pubescent.

15a. Stems 12–35 cm tall, tomentose-pilose; capitula shortly pedunculate or sessile; phyllaries usually not reflexed ................................................................. 15. *C. humile*

15b. Stems 35–70 cm tall, sparsely pubescent; capitula long pedunculate; phyllaries reflexed ................................................................. 16. *C. lipskyi*


小花金挖耳 xiao hua jin wa er

Stems 10–30 cm tall, erect, densely pubescent, often purplish, internodes 5–16 mm. Lower cauline leaves petiolate; petiole 1–3 cm, usually purple; blade elliptic or elliptic-lanceolate, 4–9 × 1–2.2 mm, thick, both surfaces glabrous or sparsely pubescent along veins, dotted with glands, base cuneate, margin with sparse tooth in middle and upper part, apex acute or obtuse; upper leaves gradually smaller upward, lanceolate or linear-lanceolate, subentire, shortly petiolate or sessile. Capitula ca. 5 mm in diam., solitary on ends of branches or branchlets, nodding at anthesis, subtended by many leaflike bracts; bracts linear-lanceolate, 6–15 mm. Involucres campanulate-globose, ca. 5 × 4–5 mm; phyllaries 3- or 4-serial, outermost shortest, ovate, cuspidate, pubescent, median narrowly oblong, denticulate, rounded at apex, inner linear. Corolla of marginal florets cylindric, 1–1.5 mm; corolla of disk florets tubular, ca. 2 mm, limb 5-lobed. Achenes ca. 2 mm. Fl. Jul–Sep, fr. Sep–Oct.

- Grassy slopes along streams; 700–1000 m. Hubei, Hunan, Jiangxi, Sichuan, Yunnan.

This species is characterized by a dwarf, slender habit; narrow, rather thick leaves; and small, erect, slenderly pedunculate capitula.


中日金挖耳 zhong ri jin wa er

*Carpesium hosokawae* Kitamura; *C. kweichowense* C. C. Chang.

Herbs, perennial. Stems 30–80 cm tall, erect, densely pubescent, often purplish, branched in upper half. Lower cauline leaves long petiolate with petioles wingless, ovate-oblong, 7–10 × 2.5–3.5 mm, thin, base cuneate, apex obtuse to acuminate; median caudine leaves shortly petiolate or sessile, lanceolate, base cuneate-attenuate, apex acuminate; upper leaves linear-lanceolate, gradually smaller upward. Capitula numerous, ca. 4.5 mm in diam., solitary on branches, nodding at anthesis, subtended by many leaflike bracts; bracts longer than capitula. Involucres campanulate-globose, ca. 4 × 4–5 mm; phyllaries 4-serial, outermost shortest, ovate, cuspidate, pubescent, median narrowly oblong, denticulate, rounded at apex, inner linear. Flores 30; corolla of marginal florets cylindric, ca. 1.5 mm; corolla of disk florets tubular, ca. 1.5 mm, limb 4- or 5-lobed. Achenes 2–2.5 mm. Fl. Aug–Sep, fr. Oct–Nov.

Grassy slopes or thickets; 700–2000 m. Guangxi, Guizhou, Hubei, Sichuan, Taiwan [Japan].
This species is somewhat similar to *Carpesium minus* but differs by its stems usually taller; lower leaves ovate to ovate-lanceolate, pubescent on both surfaces; and axillary capitula subcylindrical, arranged in spike-like form.


四川天名精 si chuan tian ming jing

Herbs, perennial. Rhizome stout, with numerous fibrous roots. Stems 50–80 cm tall, pubescent, branched in upper part. Leaves alternate; lower and middle leaves petiolate; petiole 3–8 cm, wingless, densely tomentose; blade broadly ovate, 9–12 × 6.5–12 cm, abaxially white glandular, sparingly pubescent, white pilose along veins, adaxially hirsute, base cordate or truncate, margin irregularly toothed, apex acute or shortly acuminate; upper leaves shortly petiolate or subcylindrical, elliptic or elliptic-lanceolate, base cuneate, margin subentire, apex acuminate. Capitula narrowly petiolate; terminal ones with bracteal leaves; axillary ones with smaller bracteal leaves or inconspicuous. Involucre hemispheric, ca. 7 × 8–10 mm; phyllaries 4-seriate, outer ones shorter, ovate-lanceolate, ca. 4 mm, abaxially pubescent, base membranous, apex herbaceous, acute, median membranous, ca. 5 mm, inner linear. Marginal florets tubular, ca. 1.5 mm, 5-dentate; disk florets tubular, ca. 3 mm, 5-dentate. Achenes ca. 2.5 mm. Fl. Jul.–Sep., fr. Sep.–Oct.

- Grassy slopes, forest margins; 1400–2500 m. Hubei, Sichuan, Yunnan.


天名精 tian ming jing

*Carpesium thunbergianum* Siebold & Zuccarini.

Herbs, perennial. Stems 50–100 cm tall, stout, leafy, pubescent apically, much branched. Lower cauline leaves thin, broadly elliptic to oblong, 20–28 × 8.5–15 cm, gland-dotted abaxially, shortly pubescent on both surfaces, narrowed at base into a broadly winged petiole, margin irregularly mucronulate-dentate, apex obtuse to acute; upper leaves sessile, oblong, gradually smaller, apex acute. Capitula many, 6–8 mm wide, sessile, spicately arranged, usually without bracts, deflexed in anthesis. Involucre campanulate-globose; phyllaries 3-seriate, outer ones shortest, ovate, acuminate, shortly pubescent, scarious-leathery at base, herbaceous toward apex, median and inner oblong, rounded at apex. Florets 130–300; corolla of marginal florets cylindric, ca. 1.5 mm; corolla of disk florets ca. 2.5 mm. Achenes ca. 3.5 mm, beak ca. 0.7 mm. Fl. Aug.–Oct., fr. Oct.–Dec. 2n = 40.

Roadsides, grassy slopes, thickets, forest margins, stream sides; below 2800–(3400) m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Afghanistan, Bhutan, India, Japan, Korea, Myanmar, Nepal, Russia, Vietnam; SW Asia (Caucasus, Iran), Europe].


长叶天名精 chang ye tian ming jing

*Carpesium leptophyllum* F. H. Chen & C. M. Hu; *C. leptophyllum* var. *linearibracteatum* F. H. Chen & C. M. Hu.

Herbs, perennial. Stems 50–100 cm tall, base woody and subglabrous, upper branched, puberulent. Leaves radical and cauline; radical leaves withering before flowering; lower and middle cauline leaves with 2–4 cm long petioles, elliptic or elliptic-lanceolate, 10–23 × 3.5–6 cm, both surfaces subglabrous or very sparsely pilose, abaxially light green, white and yellow globose glandular, adaxially deep green, costa purple, base cuneate, margin entire or with small cusps, apex acuminate; upper leaves sessile to shortly petiolate, lanceolate, 8–15 × 1.5–3 cm, base cuneate, margin subentire, apex acuminate. Capitula spicately arranged; axillary ones usually without bracteal leaves or very small bracteal leaves; terminal ones with 2–4 lanceolate 1.5–3.5 cm long bracteal leaves. Involucre hemispheric, 6–7 × 8–12 mm; phyllaries 4-seriate, outer ones ovate, ca. 3 mm, dry membranous, abaxially sparsely pubescent, apex acute, median oblong, 5–6 × ca. 2 mm, margin ciliate or serrulate, apex obtuse, innermost linear-lanceolate, 6–7 × ca. 1 mm, apex obtuse. Marginal florets 3- or 4-seriate, corolla tubular, ca. 2 mm, 5-dentate; disk florets tubular, 3.3–3.5 mm, limb 5-dentate. Achenes ca. 3 mm. Fl. Jul.–Sep., fr. Sep.–Oct.

- Moist forests, riversides, grasslands; 600–2300 m. Gansu, Guizhou, Hubei, Shaanxi, Sichuan.


暗花金挖耳 an hua jin wa er

*Carpesium manshuricum* Kitamura; *C. pseudotrachelii-folium* Y. Ling; *C. triste* var. *manshuricum* Kitamura; *C. triste* var. *sinense* Diels; *C. tristforme* Handel-Mazzetti.

Herbs, perennial. Stems slender, 40–100 cm tall, densely spreading pubescent, especially at base, branched in upper part. Leaves radical and cauline; radical leaves withering before flowering; lower cauline leaves with long, winged petiole, ovate-oblong, 13–20 × 3–5 cm, densely pubescent on surfaces, base rounded, margin irregularly mucronate-toothed; median leaves narrower, long acuminate; upper leaves gradually smaller, lanceolate or linear-lanceolate, acuminate at both ends. Capitula several to many, on branches; bracts linear-lanceolate, as long as or longer than capitula, reflexed. Involucre campanulate, 5–6 × 6–10 mm; phyllaries 3-seriate, mostly all alike, outer oblong-lanceolate, scarious. Corolla of marginal florets narrow, tubular, ca. 2.5 mm; corolla of disk florets ca. 3.5 × 1 mm, glabrous or sparsely pubescent. Achenes 3–3.5 mm. Fl. Jul.–Sep., fr. Sep.–Oct. 2n = 40.

Forests, stream sides; 700–3700 m. Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Shaanxi, Taiwan, Xinjiang, Zhejiang [Japan, Korea, Russia].


大花金挖耳 da hua jin wa er

*Carpesium eximium* C. Winkler.

Herbs, perennial. Stems flexuous, crisp pubescent, ca. 1 m tall, branch thickened below capitula. Leaves radical and cauline; radical leaves withering before flowering; lower cauline leaves winged petiolate, broadly ovate, 30–40 × 10–13 cm, shortly pubescent on both surfaces especially on veins, margin
irregularly coarsely doubly toothed, apex acute; median leaves gradually smaller, obovate-oblong, abruptly narrowed in lower half, apex acute; upper leaves narrow, apex acuminate. Capitula terminal, on long peduncles; bracts linear or lanceolate. Involucre cupuliform, 8–10 × 23–30 mm; phyllaries 4-seriate, outer ones similar to bracteal leaves, median oblong-linear, densely pubescent, acute, inner linear-spatulate, 5.5–6 mm. Marginal florets many seriate, corolla tubular, ca. 3.5 mm, 5-lobe; disk corolla ca. 4 mm, 5-lobe. Achenes cylindric, 5.5–6 mm, beak ca. 1 mm, gland-dotted. Fl. Jul-Sep, fr. Sep-Oct. 2n = 40.

Moist humus in deciduous or mixed forests; 700–2300 m. Gansu, Heilongjiang, Henan, Jilin, Liaoning, Shaanxi, Sichuan [Japan, Korea, Russia].


烟管头草 yan guan tou cao

Carpesium spathiforme Hosokawa.

Herbs, perennial. Stems 50–100 cm tall, robust, erect, densely white villous and crisp puberulent at base, much branched. Lower cauline leaves thin, spatulate-oblong, 9–25 × 4–6 cm, densely white villous on both surfaces, abaxially pale, adaxially green, base contracted and attenuate into winged petiole, margin irregularly doubly serrate, mucronulate, apex acute or obtuse; median leaves slightly smaller, oblong, apex obtuse or sometimes acuminated. Capitula solitary, 15–18 mm wide, long pedunculate, subtending leaves many, linear-lanceolate, 2–5 cm, base narrow, apex obtuse. Involucres cupuliform, 7–8 mm; outer phyllaries leaflike, scarious near base, abaxially white pilose, inner ones narrowly oblong, scarious, obtuse. Corolla of marginal florets tubular, ca. 1.5 mm; disk florets tubular, ca. 2.5 mm, limb ca. 1 mm. Achenes linear, 4.5–5 × ca. 1 mm. Fl. Jun–Aug, fr. Sep-Oct. 2n = 40.

Waste fields, montane slopes; below 2900(–3400) m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Zhejiang [Afghanistan, India, Indonesia, Japan, Korea, Pakistan, Papua New Guinea, Philippines, Russia, Vietnam; Australia, SW Asia (Caucasus), Europe].

“Carpesium ciliatum,” “C. pedunculosum,” and “C. pubescens” (Wallich, Numer. List, nos. 3214, 3200, 3199. 1831) belong here but are nomina nuda and were therefore not validly published (Vienna Code, Art. 32.1(d)).


尼泊尔天名精 ni bo er tian ming jing

Carpesium acutum Hayata; C. cernuum Linnaeus var. nepalense (Lessing) C. B. Clarke.

Stems not white lanate. Capitula 9–11 mm in diam. Corolla glabrous. 11a. var. nepalense


尼泊尔天名精 (原变种) ni bo er tian ming jing (yuan bian zhong)

Carpesium cernuum var. lanatum 1. D. Hooker & Thomson ex C. B. Clarke, Compos. Ind. 130. 1876; C. verbascifolium H. Léveillé.


Montane slopes; 1100–2700 m. Guizhou, Hubei, Hunan, Shaanxi, Sichuan, Yunnan [Bhutan, India, Nepal, Pakistan].


心叶天名精 xin ye tian ming jing

Herbs, perennial. Stems up to 60 cm tall, vertically striped, sparsely pubescent. Basal leaves withered at anthesis; cauline leaves ovate or oblong, 7–13 × 6–10 cm, abaxially light green, sparsely pubescent on veins, adaxially green and sparsely pubescent, base cordate or rounded, margin irregularly and sparsely dentate, apex acute. Capitula terminal on stems and branches; peduncles 5–10 cm; bracteal leaves 3–5, shortly petiolate, ovate or ovate-oblong, 1–2.5 cm, surfaces sparsely pubescent, apex acuminate. Involucre hemispheric, 6–7 × 1–1.5 mm; phyllaries ca. 4-seriate, subequal, outer ones herbaceous, narrowly oblong or oblong-lanceolate, abaxially sparsely pubescent, apex acute, inner lanceolate, dry membranous, apex acute. Marginal florets tubular, ca. 2 mm. Disk florets ca. 2.5 mm; corolla ca. 1.5 mm, pubescent, limb funnelform, 5-lobe; lobes triangular, ca. 0.5 mm. Achenes slenderly cylindric, 4–4.5 mm. Fl. Jul–Aug, fr. Sep-Oct.

Grassy slopes, conifer forests; 2300–3500 m. Sichuan, Yunnan [India, Nepal].

绒毛天名精 rong mao tian ming jing

Carpesium velutinum (J. Q. Fu.) C. Winkler ex C. B. Clarke

Herbs, perennial. Stems 30–50 cm tall, grayish yellow pilose, sometimes densely tomentose, usually not branched except peduncles. Basal leaves persistent, 3 or 4, elliptic, 4–10 × 2–4.5 cm, abaxially velutinous, more densely so on costa, adaxially hispid, base cuneate, decurrent to broadly winged petiole, margin serrate, apex obtuse or acute; lower cauline leaves similar to basal leaves, base semiamplexicaul, with winged 3–10 cm long petiole; upper leaves sessile, much smaller, elliptic-oblong, base semiamplexicaul, apex acute or obtuse. Capitula solitary on stems or axils, in racemose synflorescences, sessile or with peduncles to 3–5 cm; bracteal leaves numerous, lanceolate, with 1 or 2 larger ones 10–15 mm; other ones equal to phyllaries in length, densely pilose and glandular. Involucres hemispheric, 5–6 × 6–12 mm; phyllaries 4-seriate, subequal, outer ones lanceolate or linear-spatulate, pilose, herbaceous above, membranous below, inner dry membranous, lanceolate, apex obtuse. Marginal florets tubular, 1.5–2 mm, 5-dentate, pubescent; limb funnelform, 5-dentate. Achenes ca. 3 mm. Fl. Jul–Sep, fr. Sep–Oct.

• Forests, montane slopes; 2000–3200 m. Gansu, Shaanxi, Sichuan.


刺руч天名精 ting jing tian ming jing

Carpesium scapiforme J. Q. Fu.

Herbs, perennial. Stems 30–50 cm tall, grayish yellow pilose, sometimes densely tomentose, usually not branched except peduncles. Basal leaves persistent, 3 or 4, elliptic, 4–10 × 2–4.5 cm, abaxially velutinous, more densely so on costa, adaxially hispid, base cuneate, decurrent to broadly winged petiole, margin serrate, apex obtuse or acute; lower cauline leaves similar to basal leaves, base semiamplexicaul, with winged 3–10 cm long petiole; upper leaves sessile, much smaller, elliptic-oblong, base semiamplexicaul, apex acute or obtuse. Capitula solitary on stems or axils, in racemose synflorescences, sessile or with peduncles to 3–5 cm; bracteal leaves numerous, lanceolate, with 1 or 2 larger ones 10–15 mm; other ones equal to phyllaries in length, densely pilose and glandular. Involucres hemispheric, 5–6 × 6–12 mm; phyllaries 4-seriate, subequal, outer ones lanceolate or linear-spatulate, pilose, herbaceous above, membranous below, inner dry membranous, lanceolate, apex obtuse. Marginal florets tubular, 1.5–2 mm, 5-dentate, pubescent; limb funnelform, 5-dentate. Achenes ca. 3 mm. Fl. Jul–Sep, fr. Sep–Oct.

• Forests, montane slopes; 2000–3200 m. Gansu, Shaanxi, Sichuan.


矮天名精 ai tian ming jing

Carpesium humile J. Q. Fu.

Herbs, perennial. Rhizome short and stout, with numerous fibrous roots. Stems 12–35 cm tall, simple or branched in upper part, grayish yellow pilose, more densely so on upper part and peduncles. Basal leaves persistent at anthesis, spatulate-oblong, 6–9 × 2.5–4 cm, surfaces glandular, abaxially white pilose, adaxially pubescent, base cuneate, decurrent to very short petiole, margin serrulate or subentire, apex obtuse or acute; upper leaves sessile, oblong to oblong-lanceolate, base cuneate, apex acute. Capitula solitary on stems, branches, or axils, shortly pedunculate; bracteal leaves 3–7, lanceolate, 8–16 mm, pubescent, apex acumin ate. Involucres hyaline, 5–10 × 1.5–2 mm; phyllaries 2-seriate, outer ones lanceolate, 5–8 × 2.5–3.5 mm, herbaceous above, dry membranous below, abaxially pilose, apex acuminate, inner linear, dry membranous, apex acute. Marginal florets tubular, ca. 2 mm, 4-dentate, pubescent. Disk florets 2.5–3 mm, pubescent; limb funnelform, 4-dentate. Achenes ca. 3 mm. Fl. Jul–Aug, fr. Sep–Oct.

• Grassy slopes, river beaches, forest margins; 2000–3700 m. Gansu, Qinghai, Sichuan, Xizang, Yunnan.


高原天名精 gao yuan tian ming jing

Carpesium lipskyi F. H. Chen & C. M. Hu

Herbs, perennial. Rhizome prostrate. Stems 35–70 cm tall, densely pilose. Basal leaves usually withering before flowering, blade elliptic or spatulate, 7–15 × 3–7 cm, glandular on both surfaces, abaxially white pilose, more densely so along veins, adaxially pubescent, base decurrent to petiole, margin subentire or serrulate, apex obtuse or acute; upper leaves sessile, elliptic to elliptico-lanceolate, base broadly cuneate, apex acuminate. Capitula solitary on ends of stems, branches, or in axils, pedunculate; bracteal leaves 5–7, lanceolate, 8–16 × 2–3 mm, reflexed, sparsely pubescent, more densely so along costae. Involucres hyaline, 1–1.5 cm in diam.; phyllaries 2-seriate, outer ones similar to bracteal leaves, lanceolate, ca. 7 mm, herbaceous above, dry membranous below, abaxially pubescent, usually reflexed, median lanceolate, dry membranous, apex acuminate, innermost linear-lanceolate, apex irregularly serrulate. Marginal florets narrowly funnelform, ca. 2.5 mm, limb 5-dentate. Disk florets 3–3.5 mm; corolla white, pubescent; limb funnelform, 5-dentate. Achenes 3.5–4 mm. Fl. Jul–Aug, fr. Sep–Oct.

• Forest margins, thickets; 2000–3700 m. Gansu, Qinghai, Shanxi, Sichuan, Yunnan.


蚤草属 zao cao shu

Annual or perennial herbs or subshrubs. Stems not winged, without resin canals. Leaves alternate, usually sessile or rarely petiolate. Capitula heterogamous radiate or disciform, or homogamous discoid, in corymbiform or racemiform arrays. Involucres hemispheric to campanulate, [3–]5–10[–20+] mm in diam.; phyllaries persistent (sometimes reflexed in fruit), in (2 or)3 or 4+ series,
unequal to subequal. Receptacles flat, smooth or minutely alveolate, epaleate. Ray florets when present female, fertile; corollas yellow, laminae 1.5–2+ mm. Disk florets bisexual; corollas yellow, lobes 5. Anthers eciliate, with branched tails; endothecial tissue radial. Pollen spines with a cavity. Style branches with acute sweeping hairs, not reaching furcation. Achenes ellipsoid, shorter than corolla and often apically contracted and glandular, hairy, with elongated crystals. Pappus of barbellate, capillary to ± flattened bristles in 1 row with an outer cup of free or connate scales. \( x = 6, 7, 8, 9, 10 \).

About 77 species: Africa, Asia, Europe; six species (one endemic, one introduced) in China.


3. **P. insignis**

4. **P. chrysanth"
not densely patent, or appressed silky-pilose above, mostly coronoform, granulose-glandular. Inner row of pappus of 15–25 pinnate scabrid hairs, 4–5 mm; outer row of pappus coroniform, ca. 0.5 mm. Fl. May–Sep. 2n = 14.

Stony places, dried riverbeds. W Xizang [Afghanistan, Kyrgyzstan, Pakistan, Tajikistan, Turkmenistan; SW Asia (Iran, Iraq)].


鼠尾蚤草 shu wei zao cao

Herbs, perennial. Rhizome long, stout and densely branched, with densely white lanate buds. Stems 5–25 cm tall, not branched or with 2 or 3 flowering branches, densely tomentose. Basal leaves oblong to lanceolate, base gradually narrowed to petiole, apex obtuse; cauleine leaves sessile, 4–8 × 1.2–2 cm, oblong or ovate-oblong, surfaces densely pubescent, base semiamplexicordate, margin entire, apex obtuse; lateral veins 4 or 5 pairs, inconspicuous. Capitula solitary, rarely with additional 1 or 2 axillary capitula. Involucre broadly campanulate, 1.2–1.5 × 2–2.5 cm; phyllaries in 2 or 3 series, linear-lanceolate or linear, acuminous, 14–20 × ca. 1 mm, abaxially hispid, apex acuminate. Ray florets yellow, pubescent outside; lamina 1–1.5(–2) × ca. 1.5 mm, apex 3-dentate. Disk florets: corolla tubular, ca. 7 mm, glabrous. Achenes cylindric, ca. 2.7 mm, striped, densely pubescent, apex truncate. Pappus white, later slightly yellowish, in 2 series; inner ones of serrulate bristles; outer ones of 5–8 chaffs, ca. 0.25 mm. Fl. Jun–Aug. 2n = 18.

Rocky slopes, alpine meadows; 3400–4600 m. SW Qinghai, Xizang [N India].


金仙草 jin xian cao


Subshrubs. Rhizome stout, with several caespitose stems and dense pubescent shoots. Stems 30–50 cm tall, branched, densely leafy, pubescent; axillary buds densely white pubescent. Leaves linear-lanceolate to oblanceolate, 15–55 × 3–12 mm, abaxially grayish pubescent and glandular, adaxially sparsely pubescent, base rounded or slightly cordate, margin serrulate, apex acute or obtuse. Capitula terminal on stems or branches, solitary, 15–35 mm in diam. Involucre broadly campanulate, 10–13 × ca. 15 mm; phyllaries in 5 or 6 series, outer ones shorter, oblongate or lingulate, leathery below, herbaceous above, usually reflexed, abaxially glandular and pubescent, inner linear-lanceolate, dry membranous, margin ciliate, apex acuminate. Ray florets in 1 series; lamina oblong-linear, yellow, ca. 10 mm, apex 3-dentate. Disk florets: corolla slenderly tubular, ca. 8 mm, glandular outside; lobes deep yellow, lanceolate, apex acute; anthers apex acuminate, base caudate. Achenes cylindrical, ca. 2.7 mm, striped, densely pubescent, apex truncate. Pappus white, later slightly yellowish, in 2 series; inner ones of serrulate bristles; outer ones of 5–8 chaffs, ca. 0.3 mm. Fl. Jul–Aug, fr. Aug–Sep.

● Grasslands, forest margins; 2500–3000 m. Sichuan.


止痢蚤草 zhi li zao cao

Inula dysenterica Linnaeus, Sp. Pl. 2: 882. 1753; Aster dysentericus Scopoli; Diplopappus dysentericus Bluff & Fingerhuth.

Herbs, perennial. Stems 20–60 cm tall, branched, lanate-tomentose and sparsely glandular, in lower part less densely pubescent. Leaves sessile, soft, 1.7–6 × 0.7–2.3 cm, most lower leaves oblong or oblanceolate, narrowed to base, other cauleine leaves lanceolate, with auriculate profoundly cordate and slightly amplexical base, thinly gray tomentose or sublanate abaxially, green and scabrid adaxially, with short sessile fine tuberculate hairs, rarely subglabrous, margin almost entire or slightly undulate. Capitula 3–15(–20) per plant, in loose, corymbose or racemose synflorescences, on rather long lanate tomentose peduncles, 2–6 mm. Involucre semiglobose, 1.1–1.5 mm in diam.; phyllaries numerous, in 5 or 6 series, linear, long and tapered-acuminate at apex, almost filiform, sometimes, mostly outer ones, hamate-umbent, tomentose-pilose and not densely dotted granulate-glandular outside, sparsely pilose or subglabrous inside. Ray florets ca. 2 × as long as involucral and almost 3 × as long as tubular disk florets; corolla 8–11 mm, sparsely glandular outside, mainly in upper part; lamina un bent, 1–1.3 mm wide, longitudinally 4-veined. Disk florets tubular, 3.5–4.5 mm. Achenes oblong, 1.25–1.5 × 0.3–0.4 mm, slightly compressed, longitudinally costate, ribs in upper half covered with short bristly hairs. Inner row of pappus consisting of 15–22 denticulate-scabrid hairs, 3–4.3 mm; outer row coroniform, ca. 0.25 mm. Fl. Jun–Sep. 2n = 18.

Introduced in China [native to N Africa, SW Asia, Europe, India, Nepal, and Pakistan].


鼠尾蚤草 shu wei zao cao

Herbs, perennial. Stems solitary or a few, densely branched, entire plant grayish tomentose or densely white tomentose. Leaves obovate-spatulate, 8–45 × 4–15 mm, lower one larger, glandular, basally gradually tapered into petiole, margin slightly undulate. Capitula numerous, in rather loose racemose synflorescences at ends of branches. Involucre 9–15 mm in diam., pubescent; phyllaries in 2 or 3 series, of equal length, lanceolate, ca. 4.7 × 0.5–1.2 mm, apex rounded. Ray florets 7–8 mm, with glands outside; lamina obovate, 1.5–2 mm, narrowed at apex. Disk florets: corolla 5–8 mm, sparsely glandular outside. Achenes 2–2.8 × ca. 0.5 mm, slightly compressed. Pappus in 2 series; inner ones of numerous 5–8 mm, pinnately scabrid whitish bristles; outer ones coroniform, ca. 0.5 mm. Fl. Jul–Oct.

Pebbley and stony slopes, sandy-stony riverbanks. Xinjiang [Afghanistan, Kashmir, Kyrgyzstan, Pakistan, Tajikistan, Uzbekistan; SW Asia (Iran)].

苇谷草属 wei gu cao shu

Herbs or annual herbs. Stems not winged, without resin canals. Leaves alternate, oblong to lanceolate, entire to serrate, often villous. Capitula generally heterogamous, radiate, but in some species heterogamous disciform, or homogamous discoid. Hibernating young capitula often present in frutescent species. Receptacle epleate, smooth. Marginal florets female; corolla yellow, radiate, miniradiate, or ± tubular; epidermis not crested. Disk florets bisexual; corolla yellow; epidermis with straight cell walls, with needlelike crystals; corolla lobes short, smooth. Anthers ecalcarate, with branched tails; endothecial tissue radial; cells of antheropodium wider than long. Pollen spines with a cavity. Style branches with acute sweeping hairs, not reaching furcation. Achenes with elongated crystals. Pappus of barbellate, capillary bristles in 1 row. $x = 9$.

About 18 species: Africa, C, S, and SE Asia; three species in China.

1a. Leaf base hastate or auriculate; achenes densely pubescent ............................................................................. 1. P. indicum
1b. Leaf base narrower or cordate; achenes sparsely pubescent.

2a. Plants puberulent; capitula pendulous; leaves scabrid on both surfaces ............................................................... 2. P. cernuum
2b. Plants densely pilose; capitula erect; leaves densely pilose on both surfaces ......................................................... 3. P. vestitum


苇谷草 wei gu cao

Herbs, annual or perennial, up to 1 m tall. Stems erect, branched, 1–4 mm in diam., striped, pubescent or rarely glabrous. Leaves sessile, oblong-lanceolate or linear-lanceolate, abaxially yellowish green and hispidulous or densely white tomentose, adaxially deep green and striigilose, base truncate or auriculate and subclasping or hastate, margin entire or shallowly serrulate, apex acuminate. Capitula solitary and terminal; peduncles 3–5 cm. Involute broadly campanulate, ca. 6 mm; shortly pubescent, or rarely hispidulous or densely white tomentose; involucre narrowly linear, glandular, inner narrowly linear, glandular, innermost 4–5 × as long as outer. Receptacle hemispheric, glabrous. Florets yellow, glandular in outer surfaces. Ray florets in 1 series; lamina narrow, 6–10 × 1–1.2 mm. Disk florets numerous; corolla ca. 4 mm. Achenes terete, 0.6–0.7 mm, densely pubescent. Pappus white, or yellowish later, of ca. 15 bristles, ca. 4 mm in disk florets, absent in ray florets. Fl. Sep–Apr.

Waste fields, grassy slopes; 700–2000 m. Guangxi, Guizhou, Yunnan [India, Myanmar, Pakistan, Sri Lanka, Thailand, Vietnam; tropical Africa].

"Inula appendiculata" and "I. auriculata" (Wallich, Numer. List, nos. 2966, 2965. 1831) belong here but are nomina nuda and were therefore not validly published (Vienna Code, Art. 32.1(d)).


白背苇谷草 bai bei wei gu cao

Inula indica var. hypoleuca Handel-Mazzetti, Symb. Sin. 7: 1107. 1936; Aster lofouensis H. Léveillé & Vaniot.

Leaves narrower, 2–9 cm × 2–8 mm, abaxially densely white tomentose, base hastate, margin entire or shallowly serrulate, apex obtuse. Fl. Feb–Jul, fr. Oct.


垂头苇谷草 chui tou wei gu cao

Vicoa cernua Dalzell in Dalzell & A. Gibson, Bombay Fl. 126, 314. 1861; Inula cernula Handel-Mazzetti.

Herbs, annual. Stems 25–50 cm tall, pubescent. Petiole very short; leaf blade oblong-lanceolate, 5–7.5 × 2–2.5 cm, both surfaces shortly pubescent, base narrower, margin shallowly serrulate or dentate, rarely entire, apex acute or acuminate. Capitula 5–7 mm in diam., pendulous, in sparse corymb; peduncles slender, usually with 1 small bracteal leaf. Phyllaries linear, apiculate, pubescent; outer ones squamiform. Ray florets 20–40; lamina yellow, linear, longer than involucre, apex 3-toothed. Achenes oblong, ca. 0.6 mm, sparsely pubescent. Pappus of disk florets few, brown, 3–4 mm.

Grassy slopes; ca. 1500 m. Yunnan [Bhutan, India, Nepal].


毛苇谷草 mao wei gu cao

Inula vestita Wallich ex Candolle, Prodr. 5: 470. 1836;

**Blumeopsis** Gagnepain.

Herbs or shrubs. Stems not winged, with resin canals. Leaves alternate, simple, sessile or shortly petiolate, mucronate-toothed to laciniate or sometimes pinnately lobed. Capitula heterogamous, disiciform, solitary or paniculate. Involucre campanulate-globose; phyllaries numerous or reflexed, in 4 or 5 series, outer series shortest. Receptacle ealeate, with scalelike ridges. Marginal florets female, in several rows; corolla yellow, filiform, minutely 2- or 3-toothed. Disk florets bisexual; corollas often yellow, rarely white to purplish, tubular, 5-toothed. Anthers ecalcarate, tail ed; tails connate, caudate-acuminate; endothecial tissue radial or oblique, glandular at apex. Achenes cylindrical, hirsute, terete or obscurely 4-angular or 5- or 10-ribbed, shorter than corolla; epidermis with elongated crystals. Pappus of barbellate, polarized. Pollen spines with a cavity. Style branches with acute sweeping hairs, not reaching furcation. Achenes cylindric, white to purplish, tubular, 5-toothed. Anthers ecalcarate, tails connate, caudate-acuminate; endothecial tissue radial or oblique, glandular at apex. Achenes brown, ca. 0.8 mm, sparsely pubescent. Pappus bristles fine, usually 10, yellowish white, 2.5–3.5 mm. Fl. Apr–Jul.

Riverbeds, stony places; ca. 1500 m. W Xizang [Afghanistan, India, Nepal, Pakistan].

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**Pentanema radiatum** Boissier; *Vicoa vestita* (Wallich ex Candolle) Bentham.

Herbs, annual or biennial, 10–50 cm tall. Stems simple or branched above, pilose. Leaves oblong or ovate in synflorescence, 1–3 × 0.5–1 cm, pilose on both surfaces, base cordate, semiamplexicaul, or lower ones tapered, margin partially and usually shallowly serrate, apex acute or obtuse. Involucre 4- or 5-seriate; outer phyllaries herbaceous, linear, 4.5–6 mm, inner ones linear-lanceolate, 6–7.2 mm, scarious margined, apex acuminate. Ray corolla tube ca. 2.7 mm; lamina ca. 4.5 × 0.6 mm, pilose at base. Disk 0.6–1 cm in diam.; corollas 3.3–4.5 mm, glandular at apex. Achenes brown, ca. 0.8 mm, sparsely pubescent. Pappus bristles fine, usually 10, yellowish white, 2.5–3.5 mm. Fl. Apr–Jul.

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About 50 species: Africa, tropical Asia, Australia, Pacific islands; 30 species (five endemic) in China.

*Blumeopsis* is treated here as a synonym of *Blumea*. It is a derived ingroup in this large genus and should be included therein; see Pornpongseenua et al. (Pl. Syst. Evol. 269: 223–243. 2007).

The name *Blumea gomphrena* (Walpers) Schultz-Bipontinus ex Handel-Mazzetti (Oesterr. Bot. Z. 88: 310. 1939), based on *Vernonia gomphrena* Walpers (Nov. Actorum Acad. Caes. Leop.-Carol. Nat. Cur. 19(Suppl. 1): 253. 1843), is of uncertain application. The only known specimen associated with the name, the type, collected by Meyen from an island ("Lintin") near Guangzhou, was probably destroyed in the Berlin herbarium fire of 1943. The protologue describes a pubescent annual with amplexicaul leaves, cymes with few capitula, and lanceolate phyllaries, but it is completely lacking in useful information on floral morphology including microcharacters. A specimen at GH comprises a drawing of the type together with two fragments (leaves and immature capitula) of the type. Merrill (J. Arnold Arbor. 18: 75. 1937), who saw this material, treated *Blumea* in useful information on floral morphology including microcharacters. The shape and size of the anther thecae (calcarate, tailed, etc.), and the pollen morphology could be informative.

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1a. Anthers with sagittate or obtuse bases, without tails

1b. Anthers tailed.

2a. Outer phyllaries ovate or ovate-oblong; receptacle densely pubescent; pappus white.

2b. Outer phyllaries linear to linear-lanceolate (or if ovate-lanceolate then pappus not white); receptacle glabrous; pappus white, reddish brown, yellowish brown, or yellow.

3a. Erect herbs; old leaves abaxially densely pubescent or tomentose, margin biserrate

3b. Climbers; old leaves abaxially very sparsely pubescent or glabrescent, margin regularly and sparsely serrate.

4a. Capitula 12–13 mm in diam., usually 1–7 axillary or in sparse terminal panicles; involucre hemispheric; receptacle 6–11 mm in diam.

4b. Capitula 5–8 mm in diam., usually axillary or in dense terminal panicles; involucre campanulate; receptacle 2–3 mm in diam.

5a. Leaf blade sagittate at base; marginal florets bilabiate at apex

5b. Leaf blade linear

6a. Leaf blade sagittate at base; marginal florets bilabiate at apex

6b. Leaf blade rounded or acute at base; marginal florets equally 2–4-lobed at apex.

7a. Leaf blade pinnatisect

7b. Leaf blade margin serrate, rarely deeply dentate.

8a. Leaf blade linear

8b. Leaf blade oblong.

9a. Stems, leaves, and peduncles densely white lanate

9b. Stems, leaves, and peduncles pubescent or tomentose.
10a. Outer phyllaries ovate-lanceolate .............................................................. 9. B. lanceolaria
10b. Outer phyllaries oblong, linear, or linear-lanceolate.
   11a. Leaf base usually with 1–5 pairs of appendages .................................. 10. B. balsamifera
   11b. Leaf base without appendages.
       12a. Leaf base acuminate, margin serrulate ......................................... 11. B. formosana
       12b. Leaf base acute, margin coarsely dentate.
           13a. Leaf blade 20–30 \times 6–12 cm; capitula 8–15 mm in diam. .... 12. B. aromatica
           13b. Leaf blade 30–45 \times 10–15 cm; capitula 4–5 mm in diam. .... 13. B. conspicua

5b. Pappus white.
14a. Capitula few, in axillary or terminal small and compact racemes; leaf blade linear-lanceolate .... 14. B. temuifolia
14b. Capitula in large and sparse panicles or dense spikes; leaf blade much broader.
15a. Plants prostrate; leaves spinose-toothed .............................................. 15. B. oxyodonta
15b. Plants erect; leaves not spinose-toothed.
16a. Leaf blade lyrate lobed or pinnatisect.
    17a. Leaves abaxially white lanate, adaxially tomentose ............................ 16. B. lacera
    17b. Leaves pubescent or subglabrous.
       18a. Capitula in spiciform panicle; phyllaries not reflexed after anthesis .... 17. B. sessiliflora
       18b. Capitula in sparse or dense panicle, peduncles obvious; phyllaries reflected after anthesis.
           19a. Receptacle 4–5 mm in diam., pilose; phyllary apex purplish red.
               20a. Leaf blade pinnatisect, base amplexicaul; achenes 6-ribbed .................................................. 18. B. saussureoides
               20b. Leaf blade lyrate lobed, base narrow; achenes 10-ribbed ........ 19. B. simata
           19b. Receptacle 2–3 mm in diam., glabrous; phyllary apex green.
               21a. Stems, peduncles, and phyllaries glabrous or sparsely pubescent, without glands .................................................. 20. B. virens
               21b. Stems, peduncles, and phyllaries pubescent and glandular.
                   22a. Leaf blade upper lobe orbicular, apex rounded; capitula pedunculate, in sparse panicle ................................. 21. B. napifolia
                   22b. Leaf blade upper lobe ovate-oblong or elliptic, apex acute; capitula subsessile, in dense panicle ............ 22. B. membranacea
       16b. Leaf blade unlobed, margin dentate, serrate, or biserrate.
23a. Receptacle pilose.
    24a. Capitula 8–12 mm in diam.
       25a. Leaf blade margin regularly serrate; capitula sessile or with 0.5–1(–2) cm long peduncles, in dense panicles; innermost phyllaries ca. 1 mm wide, apex acute ................................................................. 23. B. clarkei
       25b. Leaf blade margin biserrate; capitula with up to 2 cm long peduncles, in sparse panicles; innermost phyllaries ca. 0.5 mm wide, apex caudate-acuminate ................................................................. 24. B. oblongifolia
    24b. Capitula 3–6 mm in diam.
       26a. Stems green, long pilose, glandular; blade oblong or oblong-lanceolate, glandular; capitula few, in short and dense panicles .... 25. B. adenophora
       26b. Stems purplish red, pubescent or tomentose, without glands; blade obovate to oblanceolate; capitula many, sessile, in spikelike panicles ................................................................. 26. B. fistulosa
23b. Receptacle glabrous.
    27a. Achenes not ribbed.
       28a. Florets purplish red ............................................................ 27. B. axillaris
       28b. Florets yellow ................................................................. 16. B. lacera
    27b. Achenes distinctly ribbed.
       29a. Leaves abaxially whitish sericeous or lanate.
          30a. Leaves mainly cauline, elliptic, margin denticulate; phyllary apex purplish red .................................................. 28. B. hieraciifolia
          30b. Leaves mainly basal, obovate-spatulate or obovate-oblong, margin serrate or biserrate; phyllaries green or yellowish ....... 29. B. sericans
       29b. Leaves abaxially glabrous.
1. **Blumea flava** Candolle, Prodr. 5: 439. 1836.

拟艾纳香 ni ai na xiang

*Blumea lecomtei* Vaniot & H. Léveillé; *Blumeopsis flava* (Candolle) Gagnepain; *Laggera flava* (Candolle) Bentham.

Herbs, annual, erect, 25–100 cm tall. Leaves 1.5–8 × 0.5–4 cm, spinulose-dentate, lower ones obovate, obtuse, narrowed to base, upper ones ovate-oblong, acute with an amplexical base. Capitula 3–4 mm in diam. Phyllaries 5-seriate, imbricate, glabrous, outer ones ovate, subacute, inner ones linear-oblong, acuminate. Marginal florets female, filiform, 3-toothed. Disk florets bisexual or with few sub-bisexual ones (with partially developed androecium), tubular 4- or 5-toothed. Achenes very small, glabrous, 10-ribbed. Pappus white, 2.5–5 mm. Fl. Oct–Mar.

Grassy slopes, sparse forests; below 2000 m. Guangxi, Guizhou, Hainan, Yunnan [Bhutan, India, Indonesia, Malaysia, Myanmar, Pakistan, Thailand, Vietnam].


高艾纳香 gao ai na xiang

*Conyza repanda* Roxburgh, Fl. Ind., ed. 1832, 3: 431. 1832; *Blumea eberhardtii* Gagnepain; *Leveillaea procera* (Candolle) Vaniot.

Herbs (or subshrubs), perennial, erect, 1–3.5 m tall. Stems sparsely pubescent at base, densely velutinous-villous in younger parts especially synflorescence axes. Leaves subsessile, oblanceolate-oblong to elliptic-oblong, 6–18.5 × 2.5–8 cm, abaxially scabrid to tomentose, adaxially densely villous, base tapering, sometimes nearly semiamplexicaul, margin coarsely biserate or dentate, apex acuminate; upper epidermal cells with undulate walls, lower with sinuate walls. Capitula in large, terminal, divaricate panicles, densely aggregated at ends of branches, clusters sometimes lax, subsessile, 5–7 mm in diam. Phyllaries slightly longer than florets, 1–7 mm, outer ones oblong-ovate, inner ones linear-oblong and with scarious margins, all acute, densely pubescent abaxially. Receptacle 1.5–2.5 mm in diam., flat, alveolate, pubescent. Corollas yellow, tubular; those of marginal florets filiform, 4–5 mm, with 2–4 lobes, occasionally pubescent on lobes; those of central florets 4.5–6 mm, with 5 lobes, lobes triangular, papillate, pubescent with colleters. Anther tails shorter than thickened portion of filament. Achenes pale brown, pubescent, ribbed. Pappus copious, white, ca. 5 mm. Fl. Jan–May.

Evergreen forests or thickets; 1200–2000 m. Yunnan [Bhutan, India, Myanmar, Nepal, Pakistan, Vietnam].


戟叶艾纳香 ji ye ai na xiang

1a. Leaves mainly basal, subsessile, cauleine leaves 4–6; capitula few, in globose panicles; phyllaries and corollas purplish red ................................................ 30. *B. veronicifolia*

1b. Leaves mainly cauline, with 2.5–3.5 cm long petioles; capitula many, in sparse panicles; phyllaries green; corollas yellow .................................................. 21. *B. napifolia*

4. **Blumea riparia** Candolle, Prodr. 5: 444. 1836.

假东风草 jia dong feng cao

*Conyza riparia* Blume, Bijdr. 899. 1826, not Kunth (1818).

Shrubs, scendent. Stems 0.5–2.5 m tall, somewhat pubescent among synflorescences. Leaves petiolate; petioles usually distinct, narrow, up to 6 mm, not amplexicaul; leaf blade ovate-lanceolate, 5–13 × 1.5–4 cm, ± glabrous on both surfaces, base rounded or sometimes subacute, margin remotely denticulate without coarser teeth, apex acuminate. Capitula 5–8 mm in diam., on short peduncles (1–7 mm) in tight or loose clusters in axillary and terminal panicles. Involucre 5-seriate; phyllaries of outer 2 series ovate, 2.2–3.5 mm, pubescent, of inner 2 series narrowly oblong to linear, ca. 7 mm. Receptacle 2–3 mm in diam., densely long hairy. Corollas yellow, 5.5–7 mm; lobes of central florets with glandular and few or many eglandular hairs. Pappus white. Fl. Jan–Jun. 2n = 18.

Forests, thickets, stream sides; 400–1800 m. Guangdong, Guangxi, Taiwan, Yunnan [Bhutan, India, Indonesia, Malaysia, Myanmar, Nepal, New Guinea, Philippines, Thailand, Vietnam; Pacific islands (Solomon Islands)].


戟叶艾纳香 ji ye ai na xiang


Subshrubs or shrubs, perennial, scendent; branches elongated, to 4–6 m. Stems woody, 2–3 cm in diam., terete, striate, glabrate or sparsely puberulent particularly on synflorescence axes and on younger parts. Cauline leaves thick, oblong, 9–11 × 2.5–4 cm, glabrate or minutely pilose on surfaces, base obtuse to cuneate, margin remotely mucronulate or mucronulate-denticulate, apex shortly acuminate; veins 5 or 6 pairs. Capitula hemispheric, 10–15 × 12–13 mm, in terminal and axillary lax panicles. Phyllaries in 3 or 4 series, usually distinctly purple tipped, outer ones shorter, linear-lanceolate; 2–4 × ca. 1 mm, with multicellular hairs, inner linear-lanceolate, 8–9 × ca. 0.9 mm, ciliate. Receptacle flat, 6–11 mm in diam., with white, multicellular hairs. Corollas yellow, tubular; marginal florets 8–9 mm, 3- or 4-lobed; central florets 9–10 mm with 5 triangular lobes, lobes with sessile glands and multicellular hairs. Achenes oblong to cylindrical, 1.2–1.4 × ca. 0.5 mm, 10-ribbed, sparsely hisrate. Pappus white, 5–6 mm. Fl. Aug–Apr. 2n = 16.

Thickets, grassy slopes at forest margins; 100–1900 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan (Ryukyu Islands), Thailand, Vietnam].
Herbs. Stems 60–150 cm tall, usually not branched, terete, densely pale brown pilose. Leaves sessile or very shortly petiolate up to 5 mm, oblong-lanceolate or lanceolate, rarely elliptic, 6−20 × 2.5−7 cm, abaxially densely pilose, adaxially scabrid with prominent hairs, base sagittate with 2 distinct acute auricles, margin distantly and minutely dentate, apex acute or shortly acuminate. Capitula in a large, terminal, bracteate panicle. Involute campanulate, ca. 10 mm; phyllaries in 5 series, outer ones lanceolate, ca. 1.5 mm, abaxially pubescent and glabrous; median linear, 3−5 mm, pubescent and glabrous adaxially, inner linear, ca. 7 mm, dry membranous, glabrous. Receptacle 2−3 mm in diam., alveolate, fimbriate. Corollas yellow, tubular; marginal florets filiform, ca. 5 mm, subequally 5-lobed; central florets 5−6 mm, with 5 ovate, acute lobes. Anther tails equal in length, with prominent hairs, base mucronulate, apex shortly acuminate; epidermal cells with sinu-late walls, stomata only on abaxial surface. Capitula in axillary clusters of 2−4, arranged ultimately in large panicles, pedunculate, 14−17 mm in diam.; peduncles up to 15 mm, along with rest of panicle branches densely white lanate. Phyllaries slightly longer than florets, 3−12 mm, linear, apex acute, outer densely lanate on abaxial surface, inner gradually scarious. Receptacle 4−6 mm in diam., flat, alveolate, glabrous. Corollas reddish yellow, tubular; those of marginal florets filiform, ca. 6 mm, 2- or 3-lobed, glabrous; those of central florets 6−7 mm, with 5 lobes, lobes triangular-ovate, acute, papillate, pubescent with long multicellular hairs and colleters. Anther tails equal in length to thickened portion of filament. Achenes brown, columnar, densely pubescent, finely ca. 10-ribbed. Pappus yellowish white, 5−7 mm. Fl. Oct−Feb.

Roadsides, riverbanks; below 400 m. Taiwan.


条叶艾纳香 tiao ye ai na xiang

*Blumea henryi* Dunn; *B. tonkinensis* Gagnepain; *Leveillea martini* Vaniot.

Subshrubs, 1.5−2.5 m tall. Stems branched, woody; branches terete, densely matted-lanate with long, white hairs. Leaves ± sessile, oblong-lanceolate to oblong-oblancoate, 15−40 × 4−15 cm, very densely lanate abaxially with long white hairs, pilose adaxially with prominent multicellular hairs, base tapering into an indistinct petiole, margin distantly denticulate-mucronulate, apex shortly acuminate; epidermal cells with sinate walls, stomata only on abaxial surface. Capitula in axillary clusters of 2−4, arranged ultimately in large panicles, pedunculate, 14−17 mm in diam.; peduncles up to 15 mm, along with rest of panicle branches densely white lanate. Phyllaries slightly longer than florets, 3−12 mm, linear, apex acute, outer densely lanate on abaxial surface, inner gradually scarious. Receptacle 4−6 mm in diam., flat, alveolate, glabrous. Corollas reddish yellow, tubular; those of marginal florets filiform, ca. 6 mm, 2- or 3-lobed, glabrous; those of central florets 6−7 mm, with 5 lobes, lobes triangular-ovate, acute, papillate, pubescent with long multicellular hairs and colleters. Anther tails equal in length to thickened portion of filament. Achenes brown, columnar, densely pubescent, finely ca. 10-ribbed. Pappus yellowish white, 5−7 mm. Fl. Oct−Feb.

Ravines, forests; 600−1300 m. Guangxi, Guizhou, Yunnan [Vietnam].


千头艾纳香 qian tou ai na xiang

*Conza lanceolaria* Roxburgh, Fl. Ind., ed. 1832, 3: 432. 1832; *Bileveillea granulatifolia* H. Léveillé; *Blumea lanceolaria var. spectabilis* (Candolle) Randera; *B. myriophylla* Candolle; *B. spectabilis* Candolle.

Herbs or subshrubs, perennial, erect, 1−2.5 m tall. Stems strigate, green, woody at base, hollow in center, 1−25 cm in diam., glabrate or puberulent particularly on younger parts and in synflorescence, usually unbranched except for synflorescence. Leaves herbaceous, dark green adaxially, narrowly oblong to oblongolate, 20−30 × 4−8 cm, abaxially glabrate or puberulent with sparse multicellular hairs, adaxially often rugose and glabrous, base attenuate into auriculate petiole, margin minutely serrate-dentate, apex acuminate; veins 14−16 pairs. Capitula numerous, 7.5−8.5 × 2.5−3.5 mm, terminal, in a pyramidal panicle. Involute campanulate-globose; phyllaries in 2 or 3 series, outer ones shorter, ovate-lanceolate to linear, 6.5−7.5 × 3−5.5 mm, with 5 triangular lobes, lobes with sessile glands and sparsely multicellular hairs. Achenes pale brown, oblong-terete, 1.1−1.3 × ca. 0.3 mm, pilose, 10-ribbed. Pappus pale brown to yellowish white, 5−6 mm. Fl. and fr. Mar−May. 2n = 18∗.

Roadsides, riverbanks; below 400 m. Taiwan.
ca. 0.5 mm, with prominent scariosus margins, margins and apices ciliate. Receptacle flat, 1.5–2.5 mm in diam., alveolate, fimbriate or densely pilose. Marginal florets 6–7 mm, 2- or 3-lobed, glabrous. Central florets yellowish, 6.5–7.5 mm, with 5 broadly triangular lobes, lobes with sessile glands and remote multicellular hairs. Anthers sagittate, tailed. Achenes oblong, ca. 1 × 0.3–0.4 mm, 10-ribbed, pubescent. Pappus pale reddish, ca. 5 mm. Fl. Jan–Apr. 2n = 18.

Forests, grassy slopes, riversides; 400–1500 m. Guangdong, Guangxi, Guizhou, Taiwan, Yunnan [Bhutan, India, Indonesia, Japan, Myanmar, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam].

10. **Blumea balsamifera** (Linnaeus) Candolle, Prodr. 5: 447. 1836.

**艾纳香 ai na xiang**


Shrubs or subshrubs, perennial, erect, 1–3 m tall. Stems corymbose branched, woody at base; bark grayish brown; branches terete, densely lanate-villosus with yellowish white hairs. Leaves narrowly oblong, 15–18 × 3.5–5 cm, abaxially densely silky-lanate, adaxially rugose and pilose with blunt multicellular hairs, base narrow, auriculate, auricles 10–12 mm on short petiole, margin serrulate to serrate usually with upcurved teeth, apex acuminate; veins 10–12 pairs. Capitula 6–7 mm, in spreading pyramidal pulescences, pycnaculate. Involute campaneulate; phyllaries in 3 or 4 series, densely lanate on outer surface, outer ones smaller, oblong-lanceolate 1–3 mm, compressed, inner longer, linear 5–6 mm. Receptacle 2.5–3 mm in diam., flat, alveolate, glabrous. Marginal florets filiform, to 6 mm, 2–4-lobed. Central florets yellow, tubular, 6–7 mm, lobes papillate, with sessile glands and sparse multicellular hairs. Achenes brown, terete, oblong, ca. 1 mm, sparsely hirsute. Pappus reddish, 4–6 mm. Fl. year-round. 2n = 18.

Dry fields, thickets, grasslands, mountain slopes, riverbanks; below 1200 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Taiwan, Yunnan [Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Thailand, Vietnam].


**台北艾纳香 tai bei ai na xiang**

Herbs, annual, erect, 70–90 cm tall. Stems pale, striate, densely white villous particularly in younger parts, somewhat woody at base, 0.4–0.7 cm in diam., branched above. Lower leaves larger, obovate-oblong to spatulate, 16–18 × 4–7 cm, papery, appressed white lanate abaxially, puberulent adaxially, base attenuate, margin regularly and remotely mucronulate, apex acute; veins 10–12 pairs. Capitula 8–10 × 4–5 mm, in lacy pulescences, pycnaculate. Involute globose-campaneulate; phyllaries in 3 or 4 series, outer ones shorter, linear-lanceolate, 2–3 × 0.5–0.6 mm, outer surface with numerous sessile glands and multicellular hairs, inner ones linear, 6–7 × ca. 0.5 mm, margins ciliate. Receptacle slightly convex, 3–4 mm in diam., alveolate, glabrous. Marginal florets filiform, 5–6 mm, limbs 2–3-lobed. Central florets yellowish, tubular, 6–7 mm, with 5 broadly triangular lobes, lobes with sessile glands and sparse multicellular hairs. Achenes brownish, oblong, ca. 1 × 0.4 mm, ribbed, glandular hairy. Pappus brownish, 4–5 mm. Fl. Aug–Nov.

- Semishaded broad-leaved forests, plantation floors, forest margins, grassy slopes. Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Taiwan.

12. **Blumea aromatic a** Candolle, Prodr. 5: 446. 1836.

**馥芳艾纳香 fu fang ai na xiang**

*Blumea emeiensis* Z. Y. Zhu; *B. leptophylla* Hayata; *Conyza setschwanica* Handel-Mazzetti; *Gynura taiwanensis* S. S. Ying.

Subshrubs, perennial, erect, 0.8–2.2 m tall. Stems green, striate, solid, usually woody at base, 0.5–2.5 cm in diam., branching apically; branches terete, viscid-tomentose particularly in synflorescence axes with intermixed glands and multicellular hairs. Lower leaves larger, narrowly oblong, 24–30 × 10–12 cm, villous abaxially, with multicellular hairs and numerous sessile glands (colleters), pilose adaxially, base attenuate, margin irregularly doubly dentate mucronulate, apex acuminate; veins 14–16 pairs. Capitula 8–12 × 8–15 mm, in large terminal and axillary lax pulescences, pedunculate, viscid. Involute globose-campaneulate; phyllaries in 3 or 4 series, outer ones shorter, linear-lanceolate, acuminate, with numerous colleters and multicellular hairs on outer surface, reflexed, inner linear. Receptacle 2.5–3 mm in diam., slightly convex, alveolate, minutely fimbriate. Marginal florets filiform, 6.5–7.5 mm, 2- or 3-lobed, generally glabrous. Central florets yellow, tubular, 7–8 mm, lobes 5, broadly triangular, pubescent, with colleters and sparse multicellular hairs. Achenes pale brown, oblong, 1–1.4 mm, 6–10-ribbed, hirsute. Pappus pale brown, 5–6 mm. Fl. Oct–Apr. 2n = 18.

Forest margins, grassy slopes; 300–2400 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, India, Myanmar, Nepal, Thailand, Vietnam].


**大花艾纳香 da hua ai na xiang**

*Blumea fruticosa* Koidzumi.

Subshrubs, perennial, erect, 2.5–3.5 m tall. Stems green, striate, terete, usually l igneous at base, 2–3.5 cm in diam. Leaves narrowly oblong, 30–45 × 10–15 cm, villous abaxially, sparsely pilose adaxially, base attenuate, margin doubly dentate, spinosecent, apex acuminate; veins 11–13 pairs. Capitula 7–9 × 4–5 mm, in large, terminal and axillary lax pulescences, pedunculate. Involute globose-campaneulate; phyllaries in 3 or 4 series, outer ones shorter, linear-lanceolate, 2–3 × 0.7–0.9 mm, with numerous sessile glands and multicellular hairs, inner linear, 6–7 × 0.6–0.8 mm, margins ciliate. Receptacle slightly convex, 2.5–3 mm in diam., alveolate, remotely pilose. Marginal florets filiform, 6–7 mm. Central florets yellow, 7–8 mm, with 5 triangular lobes, lobes with sessile glands and multicellular hairs. Achenes pale brown, oblong, terete, 1.2–1.4 × 0.4–0.5 mm, pilose, 10-ribbed. Pappus brownish, 5–6 mm. 2n = 54.
Broad-leaved monsoon forests. Taiwan [Japan].


狭叶艾纳香 xia ye ai na xiang

Blumea gracilis Dunn, J. Linn. Soc., Bot. 35: 502. 1903, not Candolle (1836).

Perennials. Stems 45–85 cm tall, unbranched, pilose and glandular above. Lower leaves sessile, linear-lanceolate, 4–7.5 cm × 4–8 mm, abaxially densely pilose, adaxially scabrid or glabrescent, base decurrent, margin sparsely serrulate, apex obtuse. Capitula few, 6–8 mm in diam., in panicles. Involucres columnar to campanulate, 6–8 mm; phyllaries in 4 series, linear, outer ones leaf-like, 2–3 mm, abaxially pilose and glandular, inner 6–8 mm, membranous, apex pubescent abaxially. Receptacle flat, ca. 2 mm in diam., glabrous. Corollas yellow; marginal florets numerous, 2–3 mm, limbs 3-dentate, glabrous; central florets few, corolla tubular, 3–3.5 mm, limbs 5-lobed, densely pubescent. Achenes columnar, pubescent, ca. 1 mm. Pappus white, ca. 4 mm. Fl. Nov.

- Evergreen forests, moist valleys; 900–1900 m. Yunnan.


尖齿艾纳香 jian chi ai na xiang

Placus oxyodontus (Candolle) Kuntze.

Perennials, with short taproot. Stems usually numerous, prostrate or ascending, 15–30(–40) cm, finely pubescent. Leaves ± sessile, elliptic to obovate, 1–5 × 0.5–1.5 cm, both surfaces sparsely to densely villous and stipitate glandular, base cuneate, margin with a few sharp subspinoso teeth, apex acute. Capitula few in terminal and axillary panicles. Involucres ca. 4-serial; phyllaries lanceolate to linear, 2–6 mm, with long eglandular hairs and some stalked glands. Receptacle glabrrous. Corollas yellow, ca. 4 mm; lobes of marginal florets with few eglandular hairs, lobes of central florets with dense minute glabrous pubescence and some long eglandular hairs. Athers white, unribbed, ca. 0.6 mm. Pappus white, 3–4 mm. Fl. Mar–Jul. 2n = 18, 36.

Grasslands, forests; 1200–1700 m. Yunnan [Bhutan, India, Myanmar, Nepal, Pakistan, Thailand, Vietnam].


见霜黄 jian shuang huang

Conyza lacera N. L. Burman, Fl. Indica, 180. 1768; Blumea bodinieri Vaniot; B. chevalieri Gagnepain; B. duclouxii Vaniot; B. glandulosa Candolle; B. subcapitata Candolle; B. velutina (H. Léveillé & Vaniot) H. Léveillé & Vaniot; C. velutina (H. Léveillé & Vaniot) H. Léveillé; Senecio velutinus H. Léveillé & Vaniot.

Herbs. stems to 1.5 m tall, ca. 1.2 mm in diam., branched above, pubescent, more densely so on young branches and peduncles. Middle leaves with 1–3 cm long petioles or sessile, blade oblong, 12–15 × 5–7 cm, pinnatisect, both surfaces sparsely pilose and densely tomentulose, base sheathed, amplexicaul, apex obtuse; lateral lobes 3 or 4 pairs, unequal, alternate or subopposite above, oblong or obovate-oblong, 1.2–4 × 0.3–2 cm, margin irregularly toothed, apex shortly acute or obtuse, terminal lobe large, ovate-triangular to ovate-oblong, 5–7.5 × 2.5–5 cm, apex obtuse; upper leaves smaller, pinnatisect, 4.5–7 × 2–3.5 cm, both surfaces densely pilose, terminal lobes ovate-oblong or elliptic, apex shortly
Herbs, 10–180 cm tall. Rhizome fibrous. Stems simple or
branched, quite glabrous or rarely sparingly pilose. Leaves ses-
sile, 3–22 × 0.7–10 cm; lower ones oblongate, lyrate lobed
with terminal lobe obovate and lateral lobes broadly triangular
to oblong, margin serrate with apiculate teeth, apex apiculate;
upper ones obovate to oblongate, lobed or not, apiculate-
serrate with minute teeth, both surfaces glabrate or sparingly pi-
lose. Capitula usually in large, spreading, lax, terminal, leafy
panicles, pedunculate, 5–7 mm in diam.; ultimate peduncles ca.
3 cm, bracteate, glabrous. Involute columnar, 6–7 mm; phyl-
laries in 5 or 6 series, herbaceous, entirely reflexed at maturity,
linear, 1–7.5 mm, sparsely pilose on abaxial surface with white,
spreading hairs and colleters, apex mucronate, inner series with
prominent scarious margins. Receptacle 2–2.5 mm in diam.,
convex, alveolate, glabrous. Corollas yellow, tubular; marginal
florets filiform, 4–4.5 mm, 2- or 3-lobed, glabrous; central flo-
rets 4.5–5 mm, with 5 triangular, papillate lobes. Achenes ob-
long-columnar, ribbed, sparsely hairy. Pappus white, up to 4
mm. Fl. Feb–Apr. 2n = 18.

Dry places, open thickets; ca. 1400 m. Yunnan [Bhutan, Cam-
bodia, India (including Andaman Islands), Laos, Malaysia,
Myanmar, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam].

This species is similar to Blumea membranacea but differs in the
plant entirely lacking glandular hairs except on bisexual corolla lobes;
stems and synflorescence axes glabrous or sparsely pilose; and leaves
membranous, usually more regularly serrate, glabrescent or sparsely pilose on both surfaces.


芜湖叶艾纳香 wu jing ye ai na xiang

Herbs, 15–70 cm tall. Stems subglabrous at base, densely
puberulent with numerous colleters above, especially on syn-
florescence axes. Leaves 1–12 × 0.5–5.6 cm, lower ones dis-
tinctly petiolate, upper ones subsessile, obovate, upper leaves
entire, lower leaves lyrate lobed with terminal lobe ± orbic-
ular, lateral lobes smaller, linear-oblong, all puberulent abaxi-
ally, sparsely pilose adaxially, margin dentate with broadly tri-
angular, apiculate teeth, apex obtuse. Capitula at ends of axil-
lary branches, clustered, ultimately disposed into a lax panicle,
pedunculate, 3–5 mm in diam.; peduncles up to 15 mm, densely
glandular, elongating in fruit. Involute with phyllaries longer
than florets, entirely reflexed at maturity, 1–5 mm, linear,
tapering, with broad, scarious margins. Receptacle 1–2 mm in
diam., flat, glabrous. Corollas orange-yellow, tubular; corollas
of marginal florets filiform, 2–3 mm, 2- or 3-lobed, glabrous;
those of central florets pubescent with colleters. Anther tails
shorter than thickened portion of filament. Achenes brown, ob-
long, sparsely pubescent, 5-ribbed. Pappus white, up to 3 mm.
Fl. Jan–Mar.

Fields, grasslands, open hillslopes. Yunnan (Yangbi) [India, Laos,
Malaysia, Myanmar, Thailand, Vietnam].


长柄艾纳香 chang bing ai na xiang

Blumea balansae Gagnepain.

Annuals, 7–100 cm. Stems usually simple, glandular-pubes-
cent, sometimes with few longer eglandular hairs above.
Leaves simple; petiole to 3 cm; blade obovate or lyrate, often
oblongate in outline, with 1 or 2( or 3) pairs of lateral lobes,
2–13 × 1–5 cm, thinly herbaceous, pubescent on both surfaces,
sometimes stipitate glandular adaxially at least in synflores-
cence, base narrowly attenuate, usually petiolate, margin dentic-
ulate (to shallowly dentate), apex acute or obtuse. Capitula
rather few in narrow terminal panicles. Involucre ca. 4 mm in
diam.; phyllaries purplish tinged, 6-seriate, 2–6.5 mm, glandu-
lar-pubescent, sometimes with few eglandular hairs, outermost
lanceolate, inner ones linear. Receptacle glabrous. Corollas yellow; marginal florets 3.5–4.5 mm; central florets 4.5–5.5 mm, lobes with glandular hairs and sometimes very reduced eglandular ones. Pappus white. Fl. Feb–Jun.

Forests, valleys along streams; 300–1400 m. Guangdong, Guangxi, Hainan, Yunnan [India, Indonesia, Malaysia, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, Vietnam].


七里明 qi li ming

Blumea hongkongensis Vaniot; B. hirsuta King-Jones, nom. illeg. superfl.; B. lessingii Merrill; B. malabarica J. D. Hooker.

Perennials, 1.2–1.4 m tall. Stems erect, pubescent at least above. Leaves subsessile or sometimes petiolate up to 5 mm, elliptic or oblanceolate, 4.5–12 × 0.7–2.5 cm, grayish abaxially, sparsely pubescent on both surfaces, base attenuate, margin remotely serrulate, apex briefly acuminate. Capitula in narrow often spicate panicles; peduncles 5–10(–20) mm. Involucre ca. 6 mm in diam.; phyllaries linear, 2.5–8 mm, apressed pubescent and sparsely glandular. Receptacle densely pilose. Corollas yellow, 5.5–7 mm, lobes of central florets with few glandular and eglandular hairs. Pappus white, ca. 7 mm. Fl. Oct–May. 2n = 20.

Grasslands, thickets; below 1000 m. Fujian, Guangdong, Guangxi, Hainan, Jiangxi [India, Indonesia, Malaysia, Myanmar, Philippines, Thailand, Vietnam].


长圆叶艾纳香 chang yuan ye ai na xiang

Herbs, erect, 0.8–1.2 m tall, rootstock fibrous. Stems terete, usually unbranched except in synflorescence, velutinous particularly on younger parts, terete. Leaves subsessile or shortly petiolate, oblance-lanceolate, 11–13 × 3–5 cm, velutinous, hairs with prominent base adaxially, ± villous abaxially, base attenuate, margin distantly serrate with mucronate teeth, apex acute; veins 5 or 6 pairs. Capitula 10–12 × 6–8 mm, in terminal and axillary panicles; peduncles to 20 mm. Involucre globose-campanulate; phyllaries in 2–4 series, sometimes purplish-tipped, outer ones linear-lanceolate, 3–4 × 0.5–0.6 mm, margins ciliolate. Receptacle slightly convex, 4–5 mm in diam., alveolate, remotely pilose. Corollas yellow, tubular; marginal florets filiform, 7–8 mm, with 3–5 lobes; central florets 8–9 mm, with 5 triangular lobes, lobes with sessile glands and multicellular hairs. Achenes pale brown, oblong, puberulent, 10-ribbed. Pappus white, 3–4 mm. Fl. Apr–May.

Mountain slopes, fields; ca. 1800 m. Yunnan [Vietnam].


节节红 jie jie hong

Conyza fistulosa Roxburgh, Fl. Ind., ed. 1832, 3: 429. 1832; Blumea amethystina Hance; B. glomerata Candolle; B. purpurea Candolle; B. racemosa Candolle; B. vaniotiana H. Lévêillé.

Herbs, annual. Stems simple, erect, 15–100 cm, shaggy pubescent above. Leaves oblong-lanceolate to obovate, 3–15 × 0.5–5 cm, pubescent (rarely sparsely pilose) on both surfaces, base narrowly long attenuate, margin bidentate (sometimes subobulate), apex acute. Capitula in small sessile clusters arranged in interrupted spikelike terminal racemes or sparsely branched panicles. Involucres 4–5-seriate, ca. 3.5 mm in diam.; phyllaries purplish adaxially, mostly recurved from middle by anthesis, 2.5–6 mm, pubescent, sparsely glandular, outer series ± lanceolate, remainder linear. Receptacle sparsely shortly pubescent. Corollas yellow, 4.2–5 mm, lobes of central florets with glandular and few eglandular hairs. Pappus white. Fl. Oct–Apr. 2n = 18, 30.

Grasslands, sparse forests; 300–1900 m. Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Yunnan [Bhutan, India, Myanmar, Nepal, Thailand, Vietnam].

27. Blumea axillaris (Lamarck) Candolle, Prodr. 5: 434. 1836.

柔毛艾纳香 rou mao ai na xiang

Conyza axillaris Lamarck, Encycl. 2: 84. 1786; Blumea mollis (D. Don) Merrill; B. wightiana Candolle; Erigeron mollis D. Don.

Herbs, annual or biennial, erect, 5–120 cm tall, with a taproot. Stems terete, softly pilose with spreading hairs and glands, viscid-tomentose particularly on younger parts and on synflorescence axes. Leaves ovate-oblong, 9–11 × 3.5–4 cm, papery, densely silky-villous on both surfaces with soft multicellular hairs and glands, base attenuate, margin closely doubly serrate, apex obtuse to apiculate; veins 5–7 pairs. Capitula in terminal, narrow, compact, spiciform panicle, subsessile to pedunculate. Involucral campanulate; phyllaries in 3 or 4 series, outer ones shorter, linear-lanceolate, 3–4 × 0.6–0.8 mm, densely softly villous and with multicellular hairs and glands, inner linear, 5–6 × 0.2–0.3 mm, margins ciliolate, ciliolate. Marginal florets 3.5–4.5 mm, 2- or 3-lobed, glandular. Central florets pinkish-purple
apically, whitish or yellowish at base, 3.5–4.5 mm, with 5 triangular lobes, lobes subpersistent and with sessile glands. Receptacle convex, 1.8–2 mm in diam., alveolate, glabrous. Achenes oblong, ca. 0.8 × 0.2–0.3 mm, subpersistent. Pappus white, 3–4 mm. Fl. year-round, 2n = 18, 36.

Open waste fields, hilltops, roadsides; below 1500 m. Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Afghanistan, Bhutan, Cambodia, India, Indonesia, Korea, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; Africa, Australia, Pacific islands (New Caledonia)].

28. **Blumea hieraciifolia** (Sprengel) Candolle in Wight, Contr. Bot. India, 15. 1834 ["hieraciifolia"].

**Coryza** mao zhan cao

_Coryza hieraciifolia_ Sprengel, Syst. Veg. 3: 514. 1826 ["hieraciifolia"], based on _Erigeron hieraciifolius_ D. Don, Prodr. Fl. Nepal. 172. 1825 ["hieraciifolium"], not Poiré (1808); _Blumea chinesis_ Walpers (1843), not (Linnaeus) Candolle (1836), nor Hooker & Arnott (1837); _B. hieraciifolia_ var. _macrostachya_ (Candolle) J. D. Hooker; _B. macrostachya_ Candolle.

**Blumea hieraciifolia**

Herbs. Stems 60–100 cm tall, not branched or branched, white sericeous, more densely so in upper part. Leaves mostly basal, nearly in rosette; basal leaves obovate-spatulate, or oblanceolate, 6–12 × 2.5–3.5 cm, abaxially sericeous, adaxially white tomentose, later glabrescent, base decurrent into petioles forming wings, margin irregularly serrulate, apex obtuse; lateral veins 5 or 6 pairs, prominent; cauline leaves sparse, smaller upward, spatulate, spatulate-oblong, rarely oblong, 6–12 × 1.5–3 cm, surfaces densely sericeous or lanate, sessile or with winged petioles, margin regularly serrulate, apex rounded. Capitula 2–7 in spike-like panicles, 6–10 mm in diam., sessile or with ca. 3 mm long peduncles. Involucres campanulate, ca. 8 mm; phyllaries in 4 series, outer ones 3–4 mm, abaxially densely white tomentose, apex shortly acute, middle and inner ones 5–8 mm, abaxially tomentose, margin membranous, apex acute to acuminate. Receptacle 2–4 mm in diam., glabrous, bullate. Corollas yellow; marginal florets numerous, corolla tubular, 6–7 mm, limbs shallowly 5-dentate, glabrous; central florets tubular, subequal to marginal ones in length, limbs 5-dentate, sparsely pubescent and papillate. Achenes columnar, 10–12 mm, pubescent, 4–10-ribbed. Pappus white, ca. 6 mm, scabrid. Fl. Apr.–Aug.

Waste fields, grassy slopes. Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Taiwan, Zhejiang [India, Indonesia, Myanmar, Philippines, Vietnam].

30. **Blumea veronicifolia** Franchet, J. Bot. (Morot) 10: 382. 1896.

纤枝艾纳香 xian zhi ai na xiang

**Blumea veronicifolia**

Herbs, 20–30 cm tall. Stems branched from base, pubescent. Leaves shortly petiolate, mostly radical and a few cauline, lanceolate to obovate, 1.5–5 × 0.3–1 cm, both surfaces pubescent, base tapering into petiole, margin with multicellular hairs and serrate-dentate, apex obtuse or apiculate. Capitula few, crowded in terminal globose panicles, 3–5 mm in diam.; peduncles densely villous with stipitate glands, up to 5 mm. Involucral columnar, ca. 12 mm; phyllaries in 4 series, subequal in length, purple adaxially, lanceolate, outer ones abaxially densely hairy with glands, inner ones with scarious margins. Receptacle ca. 2 mm in diam., convex, alveolate, glabrous. Corollas rose-colored; marginal florets filiform, ca. 4 mm, usually 2-lobed, glabrous; central florets ca. 5 mm, with 5 triangular papillate lobes. Anther tails almost equal in length to thickened portion of filament. Achenes dark brown, columnar, sparsely pubescent, 5-ribbed. Pappus white, 3–4 mm. Fl. Apr.–May.

- Waste fields; 600–1200 m. Sichuan, Yunnan.


旋覆花属 xuan fu hua shu

**Corvisartia** Mérat.

Perennials or annuals. Stems not winged, sometimes with deciduous leaves, with or more frequently without resin canals. Leaves basal and cauline, alternate, simple, usually sessile, sometimes in a basal rosette, margins usually serrate to dentate, sometimes entire. Capitula heterogamous radiate to spicate, heterogamous disciform, or homogamous discoid, borne singly or in open, corymbiform arrays. Involucres hemispheric or campanulate, [5–]10–40 mm in diam.; phyllaries persistent, in 4–7+ series. Receptacles flat...
or convex, smooth or alveolate, ealeate. Ray florets (15–)50–150+, female, fertile; corolla yellow to orange, lamina 10–30+ mm. Disk florets bisexual, mostly (50–)100–250+; corolla yellow, lobes 5; epidermis with straight cell walls, without needlelike crystals. Anthers ecalcarate, with branched tails; endothelial tissue radial; cells of antheropodium generally longer than wide. Pollen spines with a cavity. Style branches with acute sweeping hairs, not reaching furcation. Achenes ellipsoid or cylindric, ribbed; epidermis with elongated crystals. Pappus persistent, of basally connate, barbellate bristles or setiform scales usually in 1 series. x = 8, 9, 10.

About 100 species: Africa, Asia, Europe; 14 species (two endemic) in China.

Inula taiwanensis S. S. Ying (Mem. Coll. Agric. Natl. Taiwan Univ. 29(1): 78. 1989) could not be treated here because no material was seen by the present authors.

1a. Plants acaulescent; basal leaves rosette, obovate-spatulate; capitula densely congested, encircled by rosette of leaves ........................................................................................................ 1. I. rhizocephala

1b. Stems erect, leafy; capitula terminal on stems or branches, solitary or in corymb.

2a. Capitula 5–8 cm in diam.; involucre 2.5–4.5 cm in diam.; outer phyllaries broadly ovate, herbaceous; perennial herbs; achenes glabrous, 4- or 5-angled; leaves abaxially densely white lanate.

3a. Peduncles 6–12 cm, capitula in loose corymb ........................................................................................................ 2. I. helianthus

3b. Peduncles 0–4 cm, capitula in raceme .................................................................................................................. 3. I. racemosa

2b. Capitula generally less than 5 cm in diam., rarely up to 6–10 cm; outer phyllaries narrowly linear or lanceolate, herbaceous or dry membranous; herbs or shrubs; achenes pubescent or glabrous; leaves abaxially glabrous or pubescent or sericeous.

4a. Subshrubs; phyllaries unequal, innermost ones more than 2 × as long as outer, outer ones linear or subulate, dry membranous; leaves short, triangular .................................................................................... 4. I. salicola

4b. Perennial herbs; phyllaries subequal, rarely inner ones longer, outer ones linear, herbaceous; leaves not short and triangular.

5a. Capitula 6–10 cm in diam.; involucre 1.8–4 cm in diam.; outer phyllaries narrowly linear, usually reflexed, with long spreading purplish brown hairs; ray floret lamina 2–3 × as long as involucre, abaxially pilose; pappus white, achenes glabrous ........................................................................................................ 5. I. hookeri

5b. Capitula 1–5 cm in diam.; involucre 0.5–2 cm in diam.; outer phyllaries similar to inner ones, erect, pubescent or glandular; ray floret lamina abaxially glabrous; pappus white, slightly yellow, or red.

6a. Stems profusely branched from a woody rootstock ........................................................................ 6. I. obtusifolia

6b. Stems simple or corymbose branched above.

7a. Basal and lower cauline leaves similar to upper cauline leaves, withering at anthesis; persistent at anthesis; upper leaves erect; blade abaxially white lanate; achenes glabrous .... 7. I. sericophylla

7b. Basal and lower cauline leaves similar to upper cauline leaves, withering at anthesis; leaves spreading, abaxially glabrous or subglabrous; achenes pubescent, pilose, or glabrous.

8a. Leaf blade elliptic or oblong-lanceolate; involucre densely surrounded by bracteal leaves; outer phyllaries lanceolate-oblong; achenes glabrous ........................................................................................................ 8. I. salicina

8b. Leaf blade ovate, elliptic, lanceolate, or linear-lanceolate; involucre not surrounded by bracteal leaves; outer phyllaries linear, spatulate-linear, or linear-lanceolate; achenes pubescent, pilose, or glabrous.

9a. Leaves abaxially glabrous or pubescent on veins; pappus shorter than disk corolla; achenes glabrous.

10a. Leaf blade ovate or ovate-lanceolate, base rounded, cuneate, or auriculate, semiamplexicaul; pappus of 10 or 11 bristles ............... 9. I. helianthus-aquaticus

10b. Leaf blade elliptic-lanceolate, base rounded-auriculate; pappus of 5 or 6 bristles ................................................................. 10. I. hupehensis

9b. Leaves abaxially sparsely pubescent; pappus as long as disk corolla; achenes pubescent or pilose.

11a. Capitula 2–3.5 cm in diam.; outer phyllaries shorter than inner ones; upper stems, peduncles, and leaves abaxially scabrid pubescent; biennials ............................. 11. I. caspica

11b. Capitula 2.5–5 cm in diam.; phyllaries subequal or outer ones slightly shorter than inner ones; upper stems, peduncles, and leaves abaxially pubescent; perennials.

12a. Leaves linear-lanceolate, margin reflexed, base not auriculate; capitula 1–2.8 cm in diam.; outer phyllaries abaxially glandular ........................................ 12. I. linariifolia

12b. Leaves oblong, elliptic-lanceolate, or elliptic, margin not reflexed, base auriculate or not; capitula 2.5–5 cm in diam.; outer phyllaries abaxially glandular or not.

13a. Leaf base cordate, auriculate, semiamplexicaul .................................................. 13. I. britannica

13b. Leaf base narrower and not auriculate ................................................................. 14. I. japonica

羊眼花 yang yan hua

_Coryza rhizocephala_ (Schrenk ex Fischer & C. A. Meyer) Ruprecht; _Inula rhizocephala_ var. _intermedia_ Kitamura; _I. rhizocephala_ var. _rhizocephaloides_ (C. B. Clarke) Kitamura; _I. rhizocephaloides_ C. B. Clarke.

Perennials or biennials. Plants acaulescent. Leaves numerous, all radical, arranged in rosette, (5-)8–25–(35) cm in diam.; blade oblong or oblong-ovate, (2.5-)4–16 cm (together with petiole), (2-)2.5–3.5 cm wide, longer than synflorescence, both surfaces sparsely covered, but densely along prominent midvein abaxially, with long white multicellular appressed and sparse fine glandular hairs, base narrowed into winged petiole 2–3.5 cm, margin indistinctly and widely sinuate-dentate and densely ciliate, apex obtuse. Capitula numerous (8–20), 1.5–3 cm in diam., sessile or on densely pubescent peduncles 2–3 cm, arranged in dense semispherical sessile subcapitate synflorescences. Involucre 1.2–2 cm in diam., polyphyllous, multiseriate and with appressed phyllaries; phyllaries acute, violet and shortly ciliate distally, outer ciliae acute, upper part shortly pilose, external surface sparsely covered, but densely along prominent midvein abaxially, with long white multicellular appressed and sparse fine glandular hairs, base narrowed into winged petiole 2–3.5 cm, margin indistinctly and widely sinuate-dentate and densely ciliate, apex obtuse. Capitula numerous (8–20), 1.5–3 cm in diam., sessile or on densely pubescent peduncles 2–3 cm, arranged in dense semispherical sessile subcapitate synflorescences. Involucre 1.2–2 cm in diam., polyphyllous, multiseriate; phyllaries acute, violet and shortly ciliate distally, outer ones lanceolate-linear, 7–9 × 1–1.1 mm, unbent above, covered with hairs, inner ones linear or narrowly linear, ca. 1.2 cm × 0.8–1 mm, membranous, straight, finely glandular-pubescent. Ray florets yellow, ca. 1.5 cm, slightly longer than phyllaries, smooth; tube small, ca. 7 mm, almost 1/2 as long as pappus; lamina linear, as long as small tube, shortly tridentate. Disk florets yellow, ca. 9 mm, slightly shorter than pappus, with 5 smooth teeth. Achenes brown, terete, 1.5–2 × ca. 0.3 mm, longitudinally finely ribbed, covered with appressed short fox-red hairs or glabrous. Pappus 6–7 × as long as achene, with numerous bristles. Fl. Jun–Aug. 2n = 16.

Conifer forests, meadows, thickets; 1700–3800 m. Xinjiang, Xinjiang, Xinjiang [Afghanistan, Kashmir, Nepal, Pakistan].


土木香 tu mu xiang

_Aster helenium_ (Linnaeus) Scopoli; _Corvisartia helenium_ (Linnaeus) Mérat.

Herbs, perennial. Stems 60–150(–250) cm tall, pubescent. Basal leaves ± elliptic, mostly 15–40 × 10–20 cm, abaxially velvety lanate, adaxially thinly hairy, bases decurrent to strongly ribbed petioles, margins calllose-denticulate, otherwise entire; cauline leaves ovate or elliptic to lanceolate, 10–30 × 4.5–12 cm, bases cordate, clasping, margins serrate. Involucre (20-)30–40 mm in diam.; outer phyllaries oblong, or deltate to lanceolate, 12–20(–25) × 6–8(–20) mm, abaxially velvety hairy, inner ones progressively narrower, less hairy, more scarious. Ray florets (15-)50–100; corolla lamina (10–)20–30+ mm. Disk corollas 9–11 mm. Achenes 3–4 mm, glabrous. Pappus of (40–)50–60 basally connate, barbellate bristles or setiform scales 6–10 mm. Fl. Jun–Sep. 2n = 20.

Roadsides, wastelands, stream sides; below 2000 m. Xinjiang; widely cultivated in China [Russia, Tajikistan, Uzbekistan; SW Asia, Europe, North America].

_Inula grandis_ Schrenk ex Fischer & C. A. Meyer (Enum. Pl. Nov. 1: 50. 1841) was recorded from Xinjiang by Fl. URSS (25: 441–442. 1959) and Fl. Kazakhst. (8: 391. 1965). It is similar to _I. helenium_ but distinct in having capitula numerous; outer phyllaries glabrous, ovate-lanceolate, middle phyllaries linear, apex acute; and stem and leaves glabrous. We have not seen any specimens, and its distribution in China requires confirmation.


总状土木香 zong zhuang tu mu xiang

_Inula royleana_ C. B. Clarke.

Herbs, perennial. Rhizome tuberous. Stems 60–200 cm tall, grooved, densely pubescent. Leaves leathery; radical leaves elliptic-lanceolate, 20–50 × 10–20 cm, narrowed into petiole; cauline leaves oblong or ovate-lanceolate, often deeply lobed at base, semiamplexicaul; leaf blade densely tomentose abaxially, scabrid adaxially, margin crenate. Capitula 4–8 cm in diam., in raceme. Phyllaries in 5 or 6 series; inner phyllaries linear, apex acute. Achenes ca. 4 mm, glabrous. Pappus white, of ca. 40 bristles 9–10 cm. Fl. Aug–Sep. 2n = 20.

River beaches, grasslands; 1500–3100 m. Xinjiang [Afghanistan, Kashmir, Nepal, Pakistan].


锈毛旋覆花 xiu mao xuan fu hua


Perennials. Stems up to 35 cm tall, lower part covered with white straight hairs, upper almost smooth, with numerous long, thin, spreading, thinly angluate, densely leaved branches. Leaves sessile, lanceolate or lanceolate-linear, lower ones 5–9 × 5–6 mm, upper ones 3–6 × 1.8–3 mm, all leaves thin, pubescent abaxially with white, long, straight hairs and dispersed golden, sessile glands, base almost coriaceous, margin entire, involute, apex acuminate, spreading. Capitula numerous, ca. 1.5 cm in diam., solitary at ends of sprigs. Involucre ca. 0.8 cm in diam., polyphyllous, multiseriate and with appressed phyllaries; phyllaries acute, upper part shortly pilose, external surface sparsely golden glandular and ciliate at margins, outer ones oblong-lanceolate or lanceolate, ca. 3 × 1.2 mm, median linear, ca. 2 × as long as outer, ca. 0.4 mm wide, inner narrowly linear, 7–9 × ca. 0.3 mm. Ray florets yellow, 1.1–1.3 cm, longer than phyllaries by ca. 1/3; tube small, ca. 5 mm, shorter than pappus; lamina narrowly linear, 6–8 × 1–1.2 mm, 3- or 4-veined, tridentate, teeth ca. 0.8 mm. Disk florets yellow, as long as or slightly longer than pappus, 5-dentate, teeth smooth. Achenes brown, cylindric, 1.2–2 × ca. 0.2 mm, longitudinally finely ribbed, covered with dispersed golden, orbicular, sessile glands. Pappus 6–8 mm, with numerous bristles. Fl. May–Aug. fr. Jul–Sep.

Dry grasslands, sand banks, alluvium; 500–2000 m. Gansu, Hebei, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi, Xinjiang [Afghanistan, Mongolia, Russia].

5. *Inula hookeri* C. B. Clarke, Compos. Ind. 122. 1876.

锈毛旋覆花 xiu mao xuan fu hua

Herbs, perennial, 60–150 cm tall. Stems loosely lanate at
first. Leaves elliptic-lanceolate, 7–17 × 2.5–4 cm, pubescent and shortly glandular on surfaces but more sparsely so adaxially, base attenuate to petiole ca. 5 mm, margin minutely dentate, apex acuminata. Capitula 6–10 cm in diam., solitary on top of stem or branchlet. Involucre hemispheric, 18–40 mm in diam.; phyllaries persistent and reflexed in fruiting, in 3 or 4+ series, to ca. 1.5 × 1 cm, brown villous. Receptacles flat, smooth or minutely alveolate, eparate. Ray florets 20–30(–50+); corolla yellow, tube 5–7 mm, lamina linear, 18–45 × ca. 1 mm. Disk florets 40–100(–150); corolla yellow, 5–6.5 mm, 5-lobed. Achenes ellipsoid, ca. 1.5 mm, glabrous, with 12 sulci. Pappus white, subequal to disk corollas. Fl. Jul–Oct, fr. Oct. 2n = 20.

Mountain slopes, shrublands, sparse forests, grasslands; 2400–3600 m. SE Xizang, NW Yunnan [Bhutan, India (Sikkim), Myanmar, Nepal].


**钝叶旋覆花** dun ye xuan fu hua

Herbs, perennial, with a woody rootstock. Stems many from woody rootstock, 12–30 cm tall, densely papillate-glandular and long pilose. Leaves sessile, elliptic-lanceolate, 3–7 × 2–2.5(–4) cm, pilose and papillate-glandular, margin entire to obscurely dentate, apex acute-obtuse. Capitula usually solitary, terminal, 1.5–3 cm in diam. Involucrre depressed semiglobose; phyllaries 4- or 5-seriate, regularly imbricate, outermost herbaceous-leaflike, lanceolate-oblong, 4–6 × 2–3 mm, apex acute-obtuse, inner membranous, acuminate. Marginal florets radiate, 1–2 cm. Disk florets tubular, 6–7 mm. Achenes 2–3 mm, sericeous-villous. Pappus setae uniseriate, 20–22, pale reddish, 5–6 mm. Fl. Jun–Aug.

Rock crevices, dry cliffs, slopes, stony places; 2000–4500 m. W Xizang [E Afghanistan, India, Kashmir, Pakistan].


**绢叶旋覆花** juan ye xuan fu hua

Herbs, perennial. Stems 30–60 cm tall, densely pubescent and glandular and long pilose. Leaves sessile, elliptic-lanceolate, 4–7 × 1.5–2 cm, abaxially densely sericeous, adaxially pubescent or glabrescent, base decurrent to petiole, margin serrulate, apex obtuse or rounded; lower leaves near resembling to radical leaves in shape, or spatulate or oblong, smaller; upper leaves oblong-lanceolate to linear, base semiamplexicaul, apex acute. Capitula solitary on top of stems and branches, ca. 3 mm in diam. Involucre broadly campanulate or hemispheric, ca. 10 mm, white lanate outside; phyllaries in numerous series, subequal, outer ones linear-lanceolate, herbaceous or basally leathery, apex acute, inner linear-lanceolate, dry membranous, margin ciliate, apex acuminate. Ray florets yellow; lamina linear, ca. 15 × 1.5 mm. Disk florets yellow; corolla ca. 4 mm. Achenes 10-striped, ca. 1.5 mm, glabrous, apex truncate. Pappus white, later light brown, of ca. 20 bristles, ca. 4 mm. Fl. May–Jun, fr. Jun–Jul.

Grassy slopes; 1500–3000 m. Yunnan [Vietnam].


**柳叶旋覆花** liu ye xuan fu hua

*Aster salicinum* (Linnaeus) Scopoli; *Conyza salicina* (Linnaeus) Ruprecht; *Inula salicina* subsp. asiatica (Kitamura) Kita-gawa; *I. salicina* var. asiatica Kitamura.

Herbs, perennial. Stems 20–80 cm tall, densely leafy; internodes 1–2.5 cm. Basal leaves lanceolate, 2–6 cm × 5–15(–30) mm; cauline leaves barely elliptic to lanceolate, (3–)5–8 × 1–2 cm, both surfaces usually glabrous, adaxial venation raised, reticulation prominent, base cordate, clasping, apex acute. Capitula solitary on top of stems and branches, densely surrounded by bractlike leaves. Involucre hemispheric, 10–15(–20) mm in diam.; phyllaries in 4 or 5 series; outer ones lanceolate or spatulate-oblong, 5–7 × 1.5–2.5 mm, abaxially densely pubescent, apex obtuse or acute, inner linear-lanceolate, abaxially densely pubescent, apex acuminate. Ray florets 35–70; lamina linear, 10–15 mm. Disk corollas 5–9 mm. Achenes 1.5–2 mm, glabrous. Pappus white, of 30–40 distinct or basally connate, barbellate bristles 7–8 mm. Fl. Jun–Sep, fr. Sep–Oct. 2n = 16.

Roadsides, wastelands; 200–1000 m. Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol [Japan, Korea, Russia, Uzbekistan; Europe].


**水朝阳旋覆花** shui chao yang xuan fu hua

*Inula serrata* Bureau & Franchet, J. Bot. (Morot) 5: 50. 1891, not Persoon (1807).

Herbs, perennial. Rhizome long, usually with scalelike leaves and stolons. Stems 30–80 cm tall, pubescent and glandular. Leaves ovate-lanceolate or lanceolate, rarely ovate, 4–10 × 1.4–4 cm, abaxially yellow glandular, pubescent on abaxial veins, adaxially glabrous, margin densely toothed, apex acute or acuminate; bases of lower leaves usually gradually narrower to petioles; upper leaves sessile, base rounded or cuneate, or auriculate, semiamplexicaul; lateral veins 7 or 8 pairs, abaxially prominent. Capitula solitary on top of stems and branches, 2.5–4.5 cm in diam. Involucre hemispheric, 7–9 mm × 1–2 cm; phyllaries in 4 or 5 series, subequal, outer ones linear-lanceolate, leaflike adaxially, pubescent, inner linear-lanceolate, abaxially glabrous, margin membranous and ciliate. Ray florets yellow; lamina linear, ca. 15 mm. Disk florets yellow; corolla ca. 3 mm, with lanceolate lobes. Achenes cylindric, 10-striped, glabrous. Pappus white, of 10 or 11 bristles, ca. 2 mm. Fl. Jun–Oct, fr. Sep–Oct.

- Grassy slopes, fields, shrublands; 1200–3000 m. Gansu, Guizhou, Sichuan, Yunnan.

*Inula helianthus-aquatilis* f. rotundifolia Y. Ling (Acta Phytotax. Sin. 10: 178. 1965; 柳叶旋覆花 yuán ye xuan fu hua), described from NW Yunnan (Lijiang; 2600–2700 m, marshy grasslands), has stems densely leafy and middle leaves ovate, 2.5–4.5 × 2–3 cm, with base cordate and amplexicaul, margin coarsely serrate, and apex rounded.

湖北旋覆花 hu bei xuan fu hua


Herbs, perennial. Rhizome prostrate. Stems 30–50 cm tall, densely pubescent above, glabrescent below. Leaves oblong-lanceolate to lanceolate, 6–10 × 1.5–2.5 cm; upper leaves sessile, abaxially yellow glandular, pubescent on veins, adaxially glabrous, base amplexicaul, margin sparsely serrulate, apex acuminate; lateral veins 7 or 8 pairs, abaxially prominent. Capitula solitary, 2.5–3.5 cm in diam. Involucre subglobose, 5–7 mm × 1–1.3 cm; phyllaries subequal in length, outer ones leaflike, linear-lanceolate, pubescent, inner line-lanceolate, glabrous, margin membranous and ciliate. Ray florets yellow; lamina linear, ca. 15 mm, apex 3-dentate. Disk floret corolla ca. 3 mm, with lanceolate lobes. Achenes subcylindrical, 10-striped, 1–1.2 × 0.2–0.4 mm, pubescent with sparse appressed hairs. Involucre 1–1.3 cm in diam.; phyllaries straight, in 4 series, gland-dotted abaxially, sometimes outer ones un bent, acute, margin with golden, appressed, elliptic, sessile or shortly stalked glands, outer phyllaries lanceolate, 3.5 × 0.8 mm, leathery at base, herbaceous, pilose adaxially, membranous, 4–5 × ca. 0.6 mm, upper part sometimes reddish, inner linear, membranous, as long as median ones, ca. 0.3 mm wide, glabrous. Ray florets yellow, 0.7–1.2 cm, 2–3 × as long as phyllaries, covered outside with sparse golden glands, tube small, 2–2.5 mm, slightly shorter than pappus; lamina linear, 4–7.5 × ca. 0.8 mm, 3- or 4-veined and with 3 denticles above. Disk florets as long as pappus, yellow, with 5 acute glandular denticles at margin. Achenes brown, cylindrical, longitudinally ribbed, 1–1.2 × 0.2–0.4 mm, pubescent with sparse appressed hairs. Pappus ca. 3 mm, with ca. 25 bristles. Fl. Jul.–Aug. fr. Aug.–Oct. 2n = 24.

Riverbanks, meadows, grassy slopes, waste fields; below 1800 m. Anhui, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jiangxi, Jilin, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Zhejiang [Japan, Korea, Mongolia, Russia].


里海旋覆花 li hai xuan fu hua

*Inula caspica* var. *paniculata* C. H. An; *I. falconeri* J. D. Hooker.

Herbs, biennial. Plants bluish green, 30–50(–70) cm tall; stems mostly solitary, sometimes a few woody at base, smooth, reddish, or ± scabrid, square white pilose in upper part, thinly ribbed, erect, rarely corymbiform-branched, branches rod-shaped, straight. Lower leaves narrowly oblong or lanceolate, 7–17 × 0.8–2.5 cm, narrowed at base into a petiole ca. 1 cm; upper leaves sessile, linear-lanceolate to linear, 5–10 × 0.5–0.6 cm, glabrous, sometimes covered with fine rigid bristles at margins and abaxially, verruculose, prominently 1-veined abaxially in middle, base subauriculate, slightly cordate-semiamplexicaul, margin entire, apex acute. Capitula 2.5–3.5 cm in diam.; numerous, arranged in loose corymbiform synflorescences, on peduncles (0.3–)1.5–4(–6) cm, densely covered with rigid, tuberculate bristles and white multicellular long hairs. Involucre 1.5–2 cm in diam.; phyllaries acute, 1-veined, margins covered with short rigid, tuberculate squarrose cilia, sometimes in upper part reddish and un bent, outer phyllaries lanceolate-linear or linear, 5–6(–8) × 1–1.3 mm, leathery, inner ones narrowly linear, 7–10 × ca. 1 mm, membranous. Ray florets yellow, 9–10(–14) mm, exceeding phyllaries by ca. 1/3; tube small, 3–4 mm, as long as or slightly shorter than pappus; lamina linear, ca. 7 × 1 mm, un bent, 3- or 4-veined, lower part covered outside with yellow, sessile glands, tridentate, teeth deltate, equal, obtuse. Disk florets yellow, obconical, ca. 6 mm, slightly longer than pappus, 5-dentate, teeth equal, acute, glandular outside. Achenes brown, linear-oblong, 1.2–1.5 × ca. 0.5 mm, ribbed, pubescent with white long appressed hairs, 3–4 × as long as achenes. Pappus of 20–25 straight bristles. Fl. Jul.–Sep.

Streamsides or riverbanks in deserts; 200–2400 m. Xinjiang, Xizang [India, Kazakhstan, Pakistan, Russia (Siberia), Turkmenistan, Uzbekistan; SW Asia].

*Inula falconeri* was described based on specimens from W Xizang. According to Fl. India (13: 17. 1995) and Fl. Pakistan (210: 24–2003), it is also distributed in India and Pakistan. Its descriptions and illustrations are comparable with those of *I. caspica*, and it appears to be a synonym of the latter, which is widely distributed.


线叶旋覆花 xian ye xuan fu hua


Herbs, perennial. Plants 30–80 cm tall; stems simple or branched, covered with white sparse multicellular appressed hairs. Leaves linear-lanceolate, acuminate, sparsely pilose abaxially, glabrous adaxially, margin entire or with fine rare denticles; lower leaves ca. 10 × 1 cm, petioles ca. 3 cm; upper leaves sessile, 6–10 × 0.5–1 cm; floral leaves 1–4 cm × 1.5–5 mm. Capitula 1–2.8 cm in diam., 5–25 in corymbiform synflorescences and borne on glandular-pubescent peduncles 0.6–3 cm. Involucr 1–1.3 cm in diam.; phyllaries straight, in 4 series, gland-dotted abaxially, sometimes outer ones un bent, acute, margin with golden, appressed, elliptic, sessile or shortly stalked glands, outer phyllaries lanceolate, 3–3.5 × 0.8 mm, leathery at base, herbaceous, pilose adaxially, membranous, 4–5 × ca. 0.6 mm, upper part sometimes reddish, inner linear, membranous, as long as median ones, ca. 0.3 mm wide, glabrous. Ray florets yellow, 0.7–1.2 cm, 2–3 × as long as phyllaries, covered outside with sparse golden glands, tube small, 2–2.5 mm, slightly shorter than pappus; lamina linear, 4–7.5 × ca. 0.8 mm, 3- or 4-veined and with 3 denticles above. Disk florets as long as pappus, yellow, with 5 acute glandular denticles at margin. Achenes brown, cylindrical, longitudinally ribbed, 1–1.2 × 0.2–0.4 mm, pubescent with sparse appressed hairs. Pappus ca. 3 mm, with ca. 25 bristles. Fl. Jul.–Aug. fr. Aug.–Oct. 2n = 24.

Riverbanks, meadows, grassy slopes, waste fields; below 1800 m. Anhui, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Zhejiang [Japan, Korea, Mongolia, Russia].


欧亚旋覆花 ou ya xuan fu hua

Herbs, perennial, 10–40(–75) cm tall. Stems erect, villous. Leaves sessile; basal blades lanceolate, (3–)6–7 cm × 8–20(–30) mm; cauline blades lanceolate-elliptic to lanceolate-linear, 2–5+ × 5–12(–20) mm, abaxially usually densely villous and glandular, adaxially sparsely strigillose to glabrate, bases cordate or auriculate, clasping, margins entire or serrulate. Capitula 1–8, 2.5–5 cm in diam.; peduncles 1–4 cm, densely villous. Involucre (7–)15–22 mm in diam.; phyllaries in 4 or 5 series, outer ones lanceolate-linear, 4–6 × 0.5–0.8 mm, bases sericeous, inner similar, more scarious. Ray florets 40–70;
lamina 10–15(–20) mm. Disk floret corollas 4–6 mm, 5-lobed. Achenes cylindric, 1–1.2 mm, puberulent. Pappus white, of 20–25 distinct or basally connate bristles 4–6 mm. Fl. Jun–Sep. 2n = 16, 32.

Roadsides, wastelands, fields, sandy places; 300–1700 m. Hebei, Heilongjiang, Nei Mongol, Xinjiang [Russia, Tajikistan, Turkmenistan, Uzbekistan; Europe].

1a. Stems, peduncles, abaxial surface of leaves, and involucre densely lanate-villous ........................................ 13d. var. sublanata

1b. Stems, peduncles, abaxial surface of leaves, and involucre glabrous, or sometimes shortly pubescent.

2a. Capitula sparsely arranged .......... 13a. var. britannica

2b. Capitula densely arranged.

3a. Leaves narrowly linear, 3–10 × 0.3–1 cm .............. 13b. var. angustifolia

3b. Leaves broader than 1 cm, pubescent on both surfaces or only abaxially. Ca-

13a. Inula britannica var. britannica

欧亚旋覆花（原变种） ou ya xuan fu hua (yuany bian zhong)

Conyza britannica (Linnaeus) Ruprecht.

Capitula usually sparsely arranged.

Roadsides, wastelands; 300–1700 m. Hebei, Nei Mongol, Xinjiang [Russia; Europe].


狭叶欧亚旋覆花 xia ye ou ya xuan fu hua

Leaves narrowly linear, 3–10 × 0.3–1 cm. Capitula densely arranged.

Fields, sandy places. Xinjiang [Russia; Europe].


多枝欧亚旋覆花 duo zhi ou ya xuan fu hua

Stems strongly branched in upper part. Leaves broader than 1 cm, pubescent on both surfaces or only abaxially. Capitula numerous, smaller, 2–3 cm in diam., usually densely arranged. Involucre 7–10 mm in diam.

Xinjiang [Russia].


棉毛欧亚旋覆花 mian mao ou ya xuan fu hua

Inula britannica f. sublanata (Komarov) Kitagawa.

Stems, peduncles, abaxial surface of leaves, and involucre densely lanate-villous.

Heilongjiang, Nei Mongol, Xinjiang [Russia].


旋覆花 xuan fu hua

Herbs, perennial, from short rhizomes. Stems 15–100 cm tall, striate, appressed pilose, sometimes glabrescent, simple, branched up to synflorescence. Leaves radical and cauline; radical and lower cauline leaves smaller than median leaves, withering before flowering; median leaves lanceolate, oblone, or ovate, appressed pilose or subglabrous on both surfaces, base abruptly narrowed, sessile or semiclasping, apex subacute; upper leaves gradually smaller, 10–25 mm. Capitula usually few or solitary, radiate, ca. 3.5 cm in diam., sometimes with sub-

14a. Inula japonica var. japonica

旋覆花 (原变种) xuan fu hua (yuany bian zhong)

Inula japonica Linnaeus var. chinensis (Ruprecht ex Maximowicz) Regel; I. britannica subsp. japonica (Thunberg) Kitamura; I. britannica var. japonica (Thunberg) Franchet & Savatier; I. chinensis Ruprecht ex Maximowicz; I. giraldii Diels; I. japonica f. giraldii (Diels) J. Q. Fu.

Stems 20–60 cm tall. Leaves lanceolate to oblone, 5–10 × 1–3 cm, margin entire. Capitula usually few or solitary.

Montane slopes, grasslands, riverbanks, fields; 100–2400 m. An-


卵叶旋覆花 luan ye xuan fu hua

Stems 15–30(–50) cm tall. Leaves ovate, broadly ovate, or oblone-ovate, 4–7(–13) × 2–4 cm, base cuneate, auriculate, semiamplexicaul, margin slightly serrulate, apex acute. Capitula 1–6.

Fields, mountain slopes, riverbanks. Jilin, Liaoning, Nei Mongol.
**193. DUHALDEA** Candolle, Prodr. 5: 366. 1836.

羊耳菊属 yang er ju shu

Shrubs or perennial herbs. Stems not winged, without resin canals. Leaves alternate, simple, small to very large, hairy. Capitula heterogamous, radiate or disciform, solitary, few together, or in dense terminal corymbs. Receptacle epaneulate, with scalelike ridges. Marginal florets female; corolla yellow to white, radiate or disciform, solitary, few together, or in dense terminal corymbs. Receptacle epaleate, with scalelike ridges. Cells of antheropodium longer than wide. Pollen whitish; epidermis with straight cell walls, without needlelike crystals; corolla lobes short, smooth. Anthers ecalcarate, with branched tails; apical appendix truncate and almost emarginate; endothecial tissue polarized. Cells of antheropodium longer than wide. Pollen spines with a cavity. Style branches with acute sweeping hairs not reaching furcation. Achenes ellipsoid, hairy; epidermis with elongated crystals. Pappus of barbellate, capillary bristles in 1 row. x = (9 or)10.

About 15 species: C, E, and SE Asia; seven species (two endemic) in China.

1a. Perennial herbs; capitula 1.5–2.5 cm in diam.; phyllaries herbaceous; ray florets white, lamina distinct, 8–13.5 × 1.5–2.5 mm .................................................................................................................. 1. **D. nervosa**

1b. Shrubs or perennials; capitula 0.5–1.5(–2) cm in diam.; phyllaries dry membranous; ray florets yellow, lamina usually indistinct or distinct.

2a. Leaves thin, both surfaces glabrous; capitula 1.5–2 cm in diam., 1–5 axillary in short branches, forming cyme-panicles; ray floret lamina 6–8.5 mm ....................................................................................................... 2. **D. rubricaulis**

2b. Leaves thick, densely tomentose or lanate; capitula 0.5–1 cm in diam., terminal on stems or branches; ray floret lamina less than 6 mm or ray florets absent.

3a. Leaves decurrent along stems, forming wings; pappus light reddish brown ........................................... 3. **D. pterocaula**

3b. Stems wingless; pappus white or grayish white.

4a. Leaves persistently lanate abaxially; ray floret lamina to 1 mm or absent; involucre densely tomentose .. 4. **D. cappa**

4b. Leaves pubescent and scabrid abaxially; ray floret lamina at least 3 mm (rarely absent); involucre glandular or pubescent.

5a. Leaves lanceolate or oblanceolate, both surfaces with short glandular hairs, abaxially densely pubescent along veins; capitula few ..................................................................................................... 5. **D. forrestii**

5b. Leaves oblong, elliptic, or oblong-lanceolate, both surfaces scabrid; capitula numerous.

6a. Leaf blade ca. 10 × 3 cm, apex acute; involucre 7–8 mm, pubescent ......................................................... 6. **D. wissmanniana**

6b. Leaf blade 10–18 × 4–6 cm, apex acuminate; involucre 4–5 mm, tomentose .............................. 7. **D. euraptorioiades**


峨脉旋覆花 xian mai xuan fu hua

**Inula nervosa** Wallich ex Candolle, Prodr. 5: 471. 1836; **I. asperrima** Edgeworth; **I. esquisoii** H. Léveillé; **I. verrucosa** Klatt.

Plants subherbaceous with tuberous roots. Stems often decumbent, 0.2–1 m, usually simple, sparsely long (2.5–3 mm) tawny pilose or strigose, sometimes with rounded densely softly hairy buds at base. Petiole 0–6 mm; leaf blade elliptic, 5–13 × 2–4.5 cm, sparsely spreading pilose on both surfaces, base narrowed and cuneate, margin distantly and shallowly serrate, apex acute or acuminate. Capitula 1 or few, loosely corymbose. Involucre 5(–8)-seriate; inner phyllaries linear-lanceolate, mainly scarious, 7–10 × 0.7–1.2 mm, pilose, tips sometimes purple, apex acute to acuminate, outer ones suberect, similar but smaller or herbaceous, dilated above, sometimes to 22 mm, apex obtuse. Ray floret corollas 3.5–4.7 mm; lamina white, 8–13.5 × 1.5–2.5 mm. Disk floret corollas yellow, 6–6.7 × 8–15 mm. Achenes 2–2.5 mm, sericeous. Pappus white, as long as disk floret, rarely shorter. Fl. Jul–Oct, fr. Sep–Dec.

Dry grassy slopes, thicket; 1000–2600 m. Guizhou, SW Sichuan, SE Xizang, Yunnan [Bhutan, India (Sikkim), Myanmar, Nepal, Thailand, Vietnam].


赤茎羊耳菊 chi jing yang er ju

**Amphirhapis rubricaulis** Candolle, Prodr. 5: 343. 1836; **Inula rubricaulis** (Candolle) Bentham & J. D. Hooker.

Subshrubs, 1–2 m tall. Stems sparsely gray tomentose at first, later reddish, glabrous. Leaves sessile, elliptic-lanceolate, 6–19 × 1–4 cm, sparsely pubescent on both surfaces, base cuneate, margin serrulate, apex acuminate. Capitula radiate, 2–6 in small lateral racemes or corymbs. Involucre 5- or 6-seriate; phyllaries acuminate, outer ones spreading, lanceolate, inner...
ones linear-lanceolate, to 8–9 mm. Ray florets few; corolla tube ca. 5 mm; lamina 6–8.5 × 1.7–2 mm. Disk florets ca. 7 mm in diam.; corollas 6–7 mm. Achenes oblong, ca. 2.5 mm, sericeous. Pappus white, 5–6 mm, of ca. 20 bristles. Fl. May–Aug, fr. Jul–Nov. 2n = 20.

Slopes in valleys; 1000–2000 m. Yunnan [Bhutan, NE India, Myanmar, Nepal, Thailand, Vietnam].


翼茎羊耳菊 **yi jing yang er ju**


Perennial herbs or subshrubs, with woody roots. Stems 60–100 cm tall, ca. 1.2 cm in diam., striped, densely reddish brown pubescent and glandular, branched. Lower leaves lanceolate to elliptic-lanceolate, 18–20 × 4–5 cm; upper leaves smaller, oblong-lanceolate to linear-lanceolate, 1–4 cm, glandular on both surfaces, abaxially reddish brown pubescent, adaxially densely pubescent, base gradually narrower, extending to stem and forming wings 1–10 mm wide, margin biserate, apex acute; lateral veins 7–10 pairs and abaxially prominent, usually densely pubescent. Capitula 5–6 mm in diam., in thyrsoid or compound corymbose synflorescences; peduncles very short or up to 10 mm, slender, with filiform bracteal leaves. Involucre campanulate, ca. 7 × 5–6 mm; phyllaries in ca. 5 series, linear-lanceolate, outer ones shorter, abaxially densely pubescent. Corolla all tubular, ca. 4.5 mm, yellow glan-


羊耳菊 **yang er ju**

*Conyza cappa* Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 176. 1825; *Baccharis chinensis* Loureiro; *Blumea arnotiana* Steudel; *B. chinensis* Hooker & Arnott (1837), not (Linn.) Candolle (1836), nor Walpers (1843); *C. dentata* Blanco (1837), not Willdenow (1803); *Duhaldea chinensis* Candolle; *D. chinensis* var. *cappa* (Buchanan-Hamilton ex D. Don) Steetz; *D. lanuginosa* (C. C. Chang) Anderberg; *Inula cappa* (Buchanan-Hamilton ex D. Don) Candolle; *I. eriophora* Candolle; *I. intermedia* C. C. Chang & Y. C. Tseng (1974), not Steudel (1821); *I. lanuginosa* C. C. Chang; *I. oblonga* Candolle; *I. pseudocappa* Candolle; *Moquinia eriosematoides* (Walpers) Walpers; *Vernonia congesta* Bentham; *V. eriosematoides* Walpers.

Shrubs, 70–200 cm tall. Stems lanate-tomentose, branched. Petiole ca. 5 mm (rarely to 20 mm); leaf blade elliptic, lanceolate, or narrowly oblong, 8–23 × 2.5–5.5 cm, thick, rather papery, whitish lanate abaxially, obscuring minor veins, green and sparsely coarsely pubescent adaxially, base rounded (rarely tapered), margin remotely serrulate, apex acute or shortly acuminate. Capitula radiate or disciform, in dense corymbs. Involucre 6-seriate; phyllaries lanceolate, tomentose, inner ones 4.5–6 × ca. 0.7 mm. Ray florets few; corollas yellow, usually 4.5–5.3 mm, tubular and erect or curved outward or with short lamina to 1 × 1 mm, rarely tube 2.9–3.5 mm with lamina 2.3–2.9 mm. Disk floret corollas yellow, 4.7–6 × 4–6 mm. Achenes cylindric, ca. 1.8 mm, white tomentose. Pappus whitish, sometimes brownish tipped, 4–5 cm. Fl. Jun–Oct, fr. Aug–Dec. 2n = 20.

Dry hills, waste fields, thickets, grasslands; 200–320 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Yunnan, Zhejiang [Bhutan, India, Malaysia, Nepal, Pakistan, Thailand, Vietnam].


拟羊耳菊 **ni yang er ju**


Shrubs, 40–100 cm tall, multibranched; old branches gray or brownish gray, 3–4 mm, young branches reddish brown, pubescent, clustered with dense leaves. Leaves elliptic or oblongate, 2–7 × 0.7–3 cm, subleathery, abaxially densely pubescent, base cuneate, margin shallowly and sparsely serrulate, apex acute. Capitula obovoid, ca. 1 × 1–1.5 cm, single or several in racemes. Involucre campanulate, 8–10 mm; phyllaries 4- or 5-seriate, linear-lanceolate, pubescent, ciliate, outer ones shorter than inner ones. Marginal florets radiate; corollas ca. 9 mm; lamina linear-oblong, ca. 6 × 1.5 mm. Disk florets ca. 5 mm. Achenes narrowly terete, ca. 3 mm, whitish pubescent. Pappus whitish, nearly as long as disk florets, of ca. 20 bristles. Fl. Aug, fr. Nov.

- Open gravelly slopes, riversides; 2000–3000 m. SW Sichuan, NW Yunnan.


滇南羊耳菊 **dian nan yang er ju**


Subshrubs. Stems erect, ca. 1 m tall, yellowish brown papillose or caducous villous; flowering branches densely pubescent. Leaves sessile or with petiole ca. 2 mm, oblong, ca. 10 × 3 cm, abaxially and margin strigillose or hirsute, adaxially sparsely strigillose, base narrowed, obtuse, or slightly rounded, margin sparsely serrulate, apex acute; lateral veins 7–10 pairs, abaxially prominent. Capitula obovoid, ca. 1 cm in diam., forming terminal corymbose panicles; peduncles slender, with oblong-linear to filiform bracteal leaves, densely pubescent. Involucre subcampanulate, 7–8 mm; phyllaries in 4 or 5 series, light yellowish, linear-lanceolate, subleathery, shortly glan-

Open slopes; 1200–1700 m. S Yunnan [Vietnam].

泽兰羊耳菊 ze lan yang er ju

Inula eupatorioides Candolle, Prodr. 5: 469. 1836.

Shrubs, 1–2 m tall. Stems lanate-tomentose. Leaves sessile or with petiole up to 5 mm, oblong or oblong-lanceolate, 10–18 × 4–6 cm, papery, densely pubescent at least on veins abaxially, green and sparsely scabridulous adaxially, minor veins prominent abaxially, base acute or obtuse, margin remotely serrulate, apex acuminate. Capitula 5–7 mm in diam., in dense corymb. Involucre 4 or 5-seriate; phyllaries tomentose, inner ones linear-lanceolate, ca. 4 mm, outer oblong-lanceolate, ca. 1 mm. Ray florets female, yellow; corolla tube ca. 5 mm, usually ca. 3 mm in diam.; lamina 3–4 × 1–1.4 mm. Disk florets yellow, 4–6 mm in diam.; corollas ca. 5 mm. Achenes cylindric, ca. 2 mm, pubescent. Pappus whitish yellow, brownish tipped, slightly shorter than disk corollas, of ca. 20 bristles. Fl. Jul–Sep, fr. Dec. 2n = 20.

Thickets, under Pini forests; 1700–1800 m. SE Xizang [Bhutan, India, Laos, Myanmar, Nepal, Pakistan, N Thailand, Vietnam].


戴星草属 dai xing cao shu

Low erect annuals. Stems winged, branches spreading. Leaves alternate, obovate to oblong, mucronulate-serrulate to dentate, decurrent, gland-dotted. Capitula disciform, heterogamous, in terminal solitary, globose, or ovoid clusters, with or without bracts between capitula, clusters sessile on a common receptacle. Involucre campanulate, narrow; phyllaries narrow, dry, few seriate, unequal, scariosus, acute or obtuse. Receptacles naked, commonly globose or disciform, with few bracts or not. Marginal florets female, few to many, fertile, slender, minutely 2- or 3-dentate. Disk florets bisexual, solitary or few, fertile or sterile, tube thickened, unequal and less glandular than bracts. Marginal florets 10–15; central florets 2 or 3; corollas purplish, ca. 2.4 mm. Achenes ca. 1 mm, gland-dotted; with oblong, 3–10 × 1–3.5 cm, both surfaces densely lanate.

About 40 species: tropical and subtropical Africa and Asia, also in Australia; three species in China.

1a. Leaves shortly pubescent or glabrescent; stems and branches with usually entire wings; phyllaries glabrous or only outermost ones abaxially glandular; corolla grayish white adaxially ................................................. 1. S. afric anus

1b. Leaves tomentose or lanate; stems and branches with densely dentate wings; phyllaries densely pubescent and ciliate on margin; corolla purplish red adaxially.

2a. Leaf margin biserrulate, with stipitate glands ........................................................................................................ 2. S. indicus

2b. Leaf margin long dentate, with sessile glands ........................................................................................................ 3. S. senegalensis


戴星草 dai xing cao

Sphaeranthus cochin chinensis Loureiro; S. microcephalus Willdenow; S. suberiflorus Hayata.

Stems 40–50 cm tall, usually robust, glabrous or pubescent, curved, ascending, branched, winged, leaves entire. Cauline leaves obovate-oblong, 3–5 × 1.5–2.2 cm, shortly pubescent or glabrescent, base narrowed, apex rounded. Clusters of capitula globose or ovoid, ca. 8 mm in diam.; peduncle glabrous, winged, bracts slender, acuminate. Capitula campanulate, ca. 3 × 2.5 mm. Involucre ca. 3 × 2.5 mm; phyllaries subequal, oblanceolate, globose or only outermost ones abaxially glandular. Receptacle naked. Marginal florets numerous; corolla tubular, ca. 1.5 mm; style apex obtuse. Central florets ca. 3; corolla ca. 1.5 mm, 5-dentate; base of anthers entire, filaments dilated, glabrous; style cylindric, shortly bifid. Achenes cylindric, ca. 1 mm, gland-dotted, without pappus. Fl. Dec–May. 2n = 20.

Waste fields, grassy slopes. Guangdong, Guangxi, Hainan, Taiwan, Yunnan [Cambodia, Malaysia, Myanmar, Thailand, Vietnam; tropical Africa, Australia].


绒毛戴星草 rong mao dai xing cao

Sphaeranthus hirtus Willdenow; S. mollis Roxburgh.

Plants rank-smelling. Stems 10–45 cm tall with 4 irregularly and sharply toothed wings, minutely stipitate glandular and whitish pubescent. Leaves oblanceolate or spatulate, 2.5–6 × 0.8–2.5 cm, minutely stipitate glandular and white lanate on both surfaces, base semiamplexicaul and strongly decurrent, margin rather irregularly biserrate-dentate, apex obtuse or acute, apiculate, attenuate. Clusters of capitula ovoid-globose, ca. 12 × 10 mm; capitulum bracts linear-lanceolate, 4–5 mm, ciliate, hispid and stipitate glandular, apex finely acuminate. Phyllaries ca. 12, linear-oblong to linear-spatulate, more scariosus and less glandular than bracts. Marginal florets 10–15; central florets 2 or 3; corollas purplish, ca. 2.4 mm. Achenes ca. 1 mm, puberulent. Fl. Dec–Apr. 2n = 20.

Sandy banks along rivers, grasslands, thickets; 700–1000 m. Yunnan [Bhutan, Cambodia, India, Laos, Malaysia, Nepal, Thailand, Vietnam; Africa, Australia].


非洲戴星草 fei zhou dai xing cao

Sphaeranthus lecomteanus O. Hoffmann & Muschler.

Plants 20–90 cm tall, usually robust, densely pubescent, ascending, branched, winged, wings dentate. Cauline leaves usually oblong, 3–10 × 1–3.5 cm, both surfaces densely lanate,
base narrowed, margin with densely spinelike denticles, apex obtuse. Clusters of capitula globose or ovoid, 11–18 × 9–10 mm; peduncle pubescent. Capitula campanulate. Phyllaries 9–14, subequal, outer ones linear-lanceolate, 4–4.5 mm, densely pubescent. Receptacle naked. Marginal florets 7–12; corolla tubular, ca. 2.5 mm; style apex obtuse. Central florets 2–5; corolla 3–3.5 mm, 5-dentate; base of anthers entire, filaments dilated, glabrous; style cylindric, shortly bifid. Achenes cylindric, ca. 1 mm, gland-dotted, without pappus. Fl. Dec–Apr. 2n = 20.

Roadside, thickets, riverbanks; 600–1300 m. Yunnan [tropical Africa and Asia].

翼茎草属 yi jing cao shu

Herbs, perennial, usually rhizomatous and/or ligneous-tuberous-rooted. Stems erect, simple, internodes winged by decurrent leaf bases, lanate-tomentose and/or glandular. Leaves cauline, alternate, sessile; blade linear to elliptic or obovate, base decurrent, margin usually serrate to serrulate or denticulate, rarely entire. Capitula disciform, sessile, in spiciform arrays. Involucre cylindric-campanulate to campanulate; phyllaries persistent, in 4–6 series, distinct, narrowly lanceolate, unequal. Receptacles flat, epaleate.

Ray florets absent. Marginal florets female, in 1–3+ series, fertile; corollas yellowish. Central florets bisexual, but functionally male, (1 or)2–15; corollas yellowish, lobes 5. Style with acute sweeping hairs reaching furcation. Achenes cylindric to fusiform, angled or slightly compressed, ribs 6–9, faces usually sparsely strigose to hispidulous, minutely sessile glandular between ribs. Pappus persistent, of distinct, scabrid bristles in 1 or 2 series. x = 10.

About 18 species: SE Asia, Australia, North and South America; one species in China.

翼茎草 yi jing cao


Herbs, up to 1 m tall. Stems and branches winged, branched, lanate. Middle leaves sessile, obovate or obovate-oblong, 4–6 × 1.5–2 cm, both surfaces lanate, more densely so on abaxial surface, base decurrent, margin serrulate, apex obtuse; costa adaxially prominent, lateral veins 5–10 pairs, inconspicuous; upper leaves sessile, smaller, narrowly oblong or ovate-oblong, 15–25 × 4–6 mm, base gradually narrower, margin undulate, inconspicuously serrulate, apex acute or obtuse. Capitula 1.5–2 mm in diam., 2–7 in spikes 2–9 cm. Involucre campanulate, ca. 4 mm; phyllaries in 4 or 5 series, apex purplish red, outer ones spatulate or ovate-oblong, ca. 3 mm, abaxially densely lanate, apex 1–3-dentate or obtuse, middle narrowly oblong or linear, 3–3.5 mm, dry membranous, apex abaxially pubescent or glabrous, apex sometimes fimbriate, innermost linear or filiform, ca. 4 mm, glabrous, apex acute or acuminate. Marginal florets in numerous series, filiform, apex 3-dentate or truncate. Central florets 1 to several, tubular, 3–4 mm; limbs 5-dentate or rarely 6- or 7-dentate. Achenes ca. 0.5 mm, ribbed. Pappus in 1 series, white, ca. 3 mm, connate at base. Fl. Dec–Apr.

Waste fields; low elevations. Hainan [India, Indonesia, Laos, Philippines, Vietnam; Australia].

鹅不食草属 e bu shi cao shu

Herbs, small, pubescent, branches spreading, prostrate, rather woody. Leaves alternate, obovate, dentate, sessile, not decurrent. Capitula axillary, solitary, shortly pedunculate, heterogamous, disciform, florets yellow. Involucre hemispheric; phyllaries 1- or 2-seriate, oblanceolate, obtuse, scarious, entire, incurved in fruit. Receptacle naked. Marginal florets female, numerous, many seriate, fertile; corolla elongate, slender, tubular, inflated below. Central disk florets bisexual, fewer; functionally male, tubular, 4- or 5-dentate. Anthers sagittate at base; endothecial tissue radial. Style of female and bisexual florets bifid; style branches with obtuse sweeping hairs reaching below furcation. Achenes cylindric, slender, broadly 10-ribbed, hairy at base. Pappus absent. x = 10.

About 14 species: Africa, Asia, Australia, Central and South America; two species in China.

1a. Leaves obovate or obovate-oblong, margin distinctly and coarsely dentate; stems and branches not winged .......... 1. E. australis
1b. Leaves linear or linear-oblong, margin entire or inconspicuously serrulate; stems and branches winged .......... 2. E. divaricata

鹅不食草 e bu shi cao

Sphaeromorphaea australis (Lessing) Kitamura.

Herbs, annual. Stems much branched, branches straggling, flexuous, woody toward base. Cauline leaves oblanceolate-oblong, 3.5–4 × 1–1.8 cm, sparsely pilose on both surfaces, base narrowed into petiole, margin irregularly toothed or lyrate-pinnatifid, lobes often obtuse, mucronulate and irregularly mucronulate-dentate, apex obtuse or rounded; upper leaves ± same size as median ones. Capitula globose, 4–6 mm in diam., shortly pedunculate; peduncle 3–12 mm, few bracteate or not. Involucre depressed hemispheric, ca. 6 × 1 mm; phyllaries in 1 or 2 series, outer ones shorter, ovate, apex acute, others oblong, scarious, apex obtuse. Corolla of marginal florets ca. 0.7 mm; corolla of central florets ca. 1.3 mm, 5-dentate. Achenes cylindric, ca. 0.5 mm, gland-dotted. Fl. Mar–Jun and Sep–Nov.

光梗阔苞菊 guang geng kuo bao ju

Herbs or subshrubs, procumbent to ascending. Stems well branched, sulcate-striate, glabrous, rarely sparingly puberulent. Leaves sessile, obovate to oblanceolate, 3–5 × 0.7–1.7 cm, glabrous on both surfaces, base gradually narrowed, margin irregularly and sparsely dentate, apex obtuse to rounded; upper leaves smaller and narrower. Capitula 6–8 mm in diam. when fresh, to 10 mm in diam. when dried, ca. 7 mm, shortly pedunculate or sessile, densely congested in terminal corymbs. Involucres ovoid to broadly campanulate; phyllaries 5- or 6-seriate, glabrous, outer ones broadly ovate, 2.5–4 × 2–3 mm, subentire, apex obtuse to rounded, inner linear to lanceolate, 4–5 × 0.5–1 mm, margin subentire, apex acute. Receptacle flat, foveolate. Marginal florets numerous; corolla filiform, narrowly linear-apiculate, 3.5–4 mm, glandular; achenes reddish brown, with pale ribs, cylindric, 1–1.4 × 0.2–0.3 mm, appressed strigilllose and glandular; pappus nearly as long as corolla. Central florets 18–22; corolla 4–5 mm, 5-lobed, lobes triangular, glandular; achenes yellowish, cylindric, grooved, 0.8–1.2 × 0.4–0.5 mm, strigillose; pappus shorter than corolla. 2n = 40.

Coastal brackish areas and tidal flats, often associated with mangroves and near graveyards on seashores. Guangdong, Guangxi, Hainan, Taiwan [Vietnam].

翼茎阔苞菊 yi jing kuo bao ju


翼茎阔苞菊 Conyza sagittalis Lamarck, Encycl. 2: 94. 1786; Gnaphalium suaveolens Vellézo; Pluchea suaveolens (Vellézo) Kuntze.

Herbs, perennial, erect, aromatic, coarse, 1–1.5 m tall, ca. 1.5 cm in diam. at base, much branched, branches densely tomentose. Stems conspicuously winged by decurrent leaves. Median leaves sessile, lanceolate to broadly lanceolate, 6–12 × 2.5–4 cm, thinly tomentose with viscid glands on surfaces, base attenuate, margin serrate, apex acuminate. Capitula 7–8 mm in diam. when fresh, to ca. 10 mm in diam. when dried, 4–5 mm,
in compound terminal and axillary corymb; peduncle 5–25 mm. Involucrure hemispheric; phyllaries greenish brown, 4- or 5-seriate, outer ones widely elliptic to widely obovate, 1–2 × 1–1.5 mm, tomentose abaxially, margins ciliate, apex acuminate, inner lanceolate to linear-lanceolate, 3–4 × 0.4–0.6 mm, grading to glabrous. Receptacle flat, glabrous. Marginal florets numerous; corolla white, 3–3.5 mm, 3-lobed; achenes brown, cylindrical, with 5 pale ribs, 0.6–0.8 × ca. 0.2 mm, with viscid glands; pappus white, slightly longer than corolla. Central florets 50–60; corolla white, purplish toward summit, filiform, 3.5–4 mm, 3-lobed; mature achenes not seen; pappus white, slightly shorter than corolla. Central florets 20–25; corolla whitish, pinkish toward summit, 4–5 mm, sparingly glandular hairy at base; anthers obtuse at apex, shortly tapered at base; anthers and style exerted; achenes vestigial. Fl. and fr. Mar–Oct. 2n = 20.

Exposed flat areas, riverbeds, and swamps, often in large numbers in abandoned rice paddies and grassy fields. Naturalized in Taiwan [native to North and South America].


Pluchea eupatorioides Kurz

Herbs or subshrubs. Stems 1–2 m tall, 4–7 mm in diam., branched; young branches densely powdery puberulent, later glabrescent. Middle leaves subsessile or with petiole ca. 4 mm, blade broadly linear, 7–10 × 1.2–2 cm, both surfaces densely powdery puberulent, abaxially more densely so, base decurrent, margin sparsely serrulate, apex acuminate; upper leaves subsessile, linear, 5–7 × 0.7–1 cm. Capitula numerous, ca. 5 mm in diam., in terminal corymb; peduncles slender, 1–5 mm, densely powdery puberulent. Involucrure campanulate, 5–6 mm; phyllaries in 5 or 6 series, outer ones ovoid or broadly ovate, 1.5–3 mm, apex acute. Marginal florets numerous; corolla filiform, 4–5 mm, limbs 3- or 4-dentate. Central florets fewer; corolla tubular, ca. 5 mm, limbs 5-dentate. Achenes 5-ribbed, ca. 0.8 mm, white pubescent. Pappus white, persistent, ca. 5 mm, connate at base in central florets. Fl. Apr–Jun.

Fields, roadsides. Guangxi, Yunnan [Cambodia, Laos, Myanmar, Thailand, Vietnam].


Pluchea carolinensis (Jacquin) G Don

Shrubs, erect, 2 m tall, 4–7 mm in diam., branched, branches finely shortly crisp hairy, later glabrate. Leaves sessile or very shortly petiolate, obovate, 2.3–8 × 1–4 cm, thickly papery, abaxially loosely puberulent to subglabrous, adaxially minutely puberulent, veinlets distinct, base attenuate, margin acutely dentate, apex acute to mucronate. Capitula narrowly cylindric to campanulate, 5–6 mm in diam. when fresh, 9–10 mm in diam. in dried specimen, 6–7 mm, in dense terminal and axillary corymb; peduncle 0–10 mm. Involucrure ovate, 4–6 mm; phyllaries 6- or 7-seriate, outer ones 2–2.5 × ca. 1.5 mm, margins ciliolate, apex obtuse, inner lanceolate to linear, 4–6 × 0.25–1 mm, margins entire, apex obtuse. Receptacle densely hissutulous. Marginal florets numerous; corolla 3–5 mm; style greatly exerted; achenes brown, cylindric, with 5–7 pale ribs, slightly curved, ca. 1 × 0.3 mm, subglabrous; pappus white, ca. 5 mm, slightly exceeding corolla. Central florets 2–7; corolla 4.5–5.5 mm, 5-lobed, lobes glandular; anthers and style greatly exerted; achenes vestigial; pappus white, as long as corolla. 2n = 20, 60.

Brackish marshes and other saline habitats widespread along the W coast; low elevations. Guangdong, Hainan, Taiwan [Cambodia, India, Japan, Laos, Malaysia, Philippines, Singapore, Thailand, Vietnam; N Australia, Pacific islands (Hawaii)].


花花柴属 hua hua chai shu


One species: C and SW Asia, Caspian region.

*六棱菊*  hua hua chai

*Serratula caspia* Pallas, Reise Russ. Reich. 2: 743. 1773; 
*Karelinia caspia* f. angustifolia Smoljaninova; *K. caspia* f. ovalifolia Smoljaninova; *Plichea caspia* (Pallas) O. Hoffmann ex Paulsen.

Perennials. Stems to 1.5 m tall, erect, terete, ribbed, leafy up to synflorescences, mainly in upper portion, corymbosely branched, gray-blue, glabrous or shortly pubescent, branches alternate, almost of equal height, scabrid. Leaves alternate, simple, sessile, oblong, 2–6 × 0.5–1.5 cm, glabrous, scabrid, uneven at margin, apex acuminate, upper leaves basally cordate, semiamplexicaul-auriculate. Capitula 1.3–2 × 0.8–2 cm, many flowered, arranged in terminal corymbiform synflorescences, 2–9; peduncles 7–25 × ca. 1 mm, scabrid. Involucre campanulate, 13–15 × 7–10 mm; phyllaries 6- or 7-seriate, light brown, sometimes reddish at apex, imbricate, rigid (subleathery), appressed, glabrous inside, with strong short appressed gray pubescence outside, margin with ciliate hairs, longer in inner phyllaries, outer ones ovate or ovate-oblong, 5–8 × 3–4 mm, middle lanceolate, ca. 10 × 2 mm, inner sublinear, 10–15 × ca. 1 mm, acuminate. Receptacle flat, with long hairs.

**1. Laggera alata** Roxburgh; *Blumea alata* D. Don, Prodr. Fl. Nepal. 171. 1825;

*六棱菊属*  liu leng ju shu

Herbs, annual to perennial. Stems with resin canals, but without fibers in phloem. Leaves dentate, long decurrent, hairy, sessile or petiolate. Capitula heterogamous, disciform, few to many, terminal in large open leafy panicles. Involucre campanulate; phyllaries 4–8-seriate, imbricate, narrow, usually squarrose. Receptacle naked. Marginal florets female, corolla filiform, 3-lobed; disk florets bisexual, few, tubular. Corolla pink or mauve. Anthers with sagittate bases, without tails; cells of antheropodium flattened; endothecial tissue radical. Style branches with obtuse sweeping hairs reaching below furcation. Achenes oblong-ellipsoid, without resin thecial tissue radical. Style branches with obtuse sweeping hairs reaching below furcation. Achenes dark brown, ca. 0.5 mm, slightly flattened, smooth, glabrous. Achenes brown, cylindrical, slightly recurved, 1.5–2 × ca. 0.3 mm, narrowed to base, triquetrous, with a ring at base, glabrous. Pappus white, 9–14 mm, sinuate at base, monocotious; in female florets consisting of numerous very thin, fine, often crenate hairs; in bisexual florets of finely cre- nate, slightly barbate-thickened hairs at apex. Fl. Jul–Sep, fr. Sep–Oct.

About 17 species: tropical Africa, Arabia, and Asia; two species in China.

The two species in China are often synonymized. If treated as separate species, the correct name for the species *Laggera pterodonta* is *L. crispa*, based on *Conyza crispa* Vahl (1790), which antedates Candolle’s name *Blumea pterodonta* from 1834.

1a. Stems bearing entire herbaceous wings 1–5 mm deep ........................................................................................................ 1. *L. alata*

1b. Stems bearing lines of narrow uneven herbaceous teeth 2–16 mm deep, usually joined by a narrow wing .................. 2. *L. crispa*


*六棱菊*  liu leng ju

*Erigeron alatus* D. Don, Prodr. Fl. Nepal. 171. 1825; 
*Blumea alata* (D. Don) Candolle; *Conyza alata* (D. Don) Roxburgh; *Imula exsiccata* H. Léveillé; *Laggera angustifolia* Hayata; *Triplostegia epilobiifolia* H. Léveillé.

Herbs, robust, much branched, up to 60(–75) cm tall, glandular pubescent. Stems winged, wings 1–5 mm deep, herbaceous, entire, rarely somewhat denticulate, continuous. Leaves oblong, 2–8(–10) × 0.7–1.5 cm, densely covered with long multisepitate hairs, base decurrent, margin denticulate, apex acute to subobtuse. Capitula 1–1.3 cm in diam., arranged in leafy racemes, on short axillary winged branches. Involucre ovoid, ca. 9 mm in diam.; phyllaries 4- or 5-seriate, outer lan-

Marginal florets multiseriate, carpogenous, reddish, 10–12 mm, with filiform, ± heteromorous, 4-dentate corolla; tube ca. 10 × 0.5 mm in upper portion. Style as long as tube, thin, flat, gla-

brous, with 2-lobed stigma, lobes reddish, thin, flat, 3–5 mm, ascending, slightly divergent, glabrous. Disk florets sterile, 10–20, reddish, with 5-dentate corolla, 10–12 × ca. 1 mm in upper portion, denticles ca. 1 mm, lanceolate, acuminate. Anthers ob-

long, ca. 2 × 0.3 mm, glabrous, united in a tube, surrounding style, basally with short entire appendages, filaments 5–6 × ca. 0.25 mm, flat, glabrous, attached to base of corolla tube. Style ca. 15 mm, filiform, ca. 0.3 mm wide, with closely arranged fine mammillae up to half of length, stigma bipartite with short (ca. 0.5 mm) upright reddish lobes, covered with mammillae; ovary cylindric, ca. 1.5 × 0.3 mm, slightly flattened, smooth, glabrous. Achenes brown, cylindrical, slightly recurved, 1.5–2 × ca. 0.3 mm, narrowed to base, triquetrous, with a ring at base, glabrous. Pappus white, 9–14 mm, sinuate at base, monocotious; in female florets consisting of numerous very thin, fine, often crenate hairs; in bisexual florets of finely cre-


Wastelands and sunny meadows; below 2300 m. Fujian, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangxi, Taiwan, Yunnan, Zhejiang [Bhutan, India, Indonesia, Laos, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam; E Africa, Madagascar].


*翼棱六棱菊* yi chi liu leng ju

*Conyza crispa* Vahl, Symb. Bot. 1: 71. 1790; *Blumea*
pterodonta Candolle; *Laggera intermedia* C. B. Clarke; *L. pterodonta* (Candolle) Schultz Bipontinus ex Oliver; *L. purpurascens* Schultz Bipontinus ex Hochstetter.

Herbs. Stems much branched, 40–100 cm tall, stems and branches narrowly winged with irregular deeply toothed lobes or interrupted wing; stem teeth and leaves densely pubescent, mainly with short erect glandular hairs. Lower leaves sessile or sometimes with winged, deeply toothed petiole to 15 mm, blade narrowly obovate, 5–17 × 1.5–6 cm, base long attenuate, margin subentire to serrate-dentate, apex acute; upper leaves narrower, slightly tapered below, oblong, sometimes subobtuse. Capitula terminal, pink to purple, 10–15 mm in diam.; peduncles slender. Involucre ca. 7 mm in diam.; phyllaries 4.5–9 mm, at least outer ones glandular-pubescent. Corolla 6.5–8 mm. Achenes ca. 1 mm. Pappus ca. 6 mm. Fl. Jan–Jul. $2n = 20$.

Strongly aromatic glandular weedy herbs on dry hill slopes, old clearings, upland rice fields, and wastelands; below 2000 m. Guangxi, Guizhou, Hubei, Sichuan, SE Xizang, Yunnan [Bhutan, India, Thailand, Vietnam; tropical Africa].


假飛蓬属 *jia fei peng shu*

Herbs, perennial. Leaves alternate, entire or pinnatisect, serrate to dentate or basally shallowly lobed, sometimes petiolate, amplexicaul, decurrent on stem as 1 or 2(or 3) pairs of lobes. Capitula disciform in small, loose corymbs on leafy branches. Phyllaries 5- or 6-seriate, imbricate, lanceolate to linear. Marginal florets female, filiform, many. Disk florets few, bisexual. Anthers tailed; endothecial tissue radial. Achenes oblong-ellipsoid with straight hairs. Pappus uniseriate of free barbellate bristles with appressed teeth.

One species: Africa, Asia, Central America.


假飛蓬 *jia fei peng*


Herbs, to 1 m tall, erect, sometimes branched at base, usually branched on upper part of stem; culms cylindric, villous and glandular. Leaves alternate, sessile, oblanceolate-ovate to obovate, 1–8 cm, both surfaces villous, parted or not, base cuneate to attenuate, margin serrate to doubly serrate, apex rounded to acute. Capitula terminal and axillary, 8–9 × 4–6 mm, in lax corymbs or cymose panicles, branches leafy. Involucre 4-seriate, margin entire or pilose, apex acuminate; outer phyllaries lanceolate, 2.5–5 mm, abaxially villous and glandular, adaxially glabrous to sparsely villous, innermost linear, central part glabrous to sparsely villous, margin membranous, 1-veined, ca. 8 mm. Receptacle concave, glabrous. Marginal disk florets numerous, female and fertile; corolla whitish to pale purplish, filiform, 3.5–4.5 mm; stigma exposed, 0.5–1 mm. Central disk florets fewer than 10 per capitulum, bisexual and fertile; corolla whitish to pale purplish, tubular, ca. 4.5 mm, 5-lobed, lobes ca. 0.5 mm; anthers obtuse at apex, shortly tailed at base; style sparsely pilose, stigma bifid, extracted. Achenes cylindric, 10-ribbed, sparsely pilose; carpopodium a broad circle, conspicuous. Pappus white, 4–5 mm. Fl. Jan–Apr.

Grows as a weed and also in disturbed lowland habitat. Taiwan [India, Pakistan; Africa, SW Asia, Central America].
1. Tribe MUTISIEAE

帚菊木族 zhou ju mu zu

Herbs, subshrubs, shrubs, trees, rarely climbers or ramblers, glabrous or with simple, glandular, malpighiaceous or stellate hairs, often glabrescent. Leaves usually evenly spaced, sometimes rosulate or densely spiraled, usually alternate, rarely opposite, lamina simple, variously shaped, usually herbaceous, venation trinerved, pinnate, sometimes parallel, or very rarely palmate, margin entire or lobed, serrate or denticulate, rarely spiny or pinnatisect, lamina rarely compound and paripinnate. Inflorescences scapose or scapiform, or synflorescences cymose or of corycose or paniculate, axillary or terminal clusters, sometimes of glomerules, very rarely of pseudocephalia. Capitula small to very large, usually chasmogamous, very rarely cleistogamous, usually monoecious, homogamous or heterogamous, radiate, very rarely ligulate, rarely disciform or discoid, 1- to many flowered; involucres cylindric to globose or urceolate; phyllaries imbricate, few to many seriate, sometimes uniseriate, rarely calulate, rarely distant, usually gradate, often papyraceous, usually homomorphic; receptacles flat, convex or rarely conical, scrobiculate, foveolate, filibrillate, or alveolate, glabrous or variously pubescent, usually eulate. Florets rarely all actinomorphic, usually marginal and disk florets distinct; marginal florets usually variously bilabiata (2/3) or pseudobilabiata (1/4), and often distinctly radicic, usually ligulate (0/5), bisexual, female, or neuter, corollas glabrous or variously pubescent, staminodes rarely present; disk florets usually bilabiata (2/3), sometimes actinomorphic (5/0), usually fertile, corollas glabrous or variously pubescent, lobes short or long; stamens usually conspicuously exerted from corolla; filaments glabrous or rarely pubescent or papillate, antheridia incomplescious or sometimes distint and variously enlarged or flattened; anther appendages usually acuminate or apiculate and several times as long as wide, sometimes thickened at apex and knoblike, sometimes truncate or rounded; anthers calcarate and caudate, rarely ecalcicate, tails usually long acute, entire or variously laciniate, sometimes conspicuously branched or pilose; styles usually well exserted from corolla and anther cylinder; style base sometimes with conspicuous nectary, with or without distinctive basal node, glabrous, style shaft usually glabrous, rarely papillose in upper part, style branches usually relatively short, apices acute, obtuse to rounded, or truncate and glabrous to papillose dorsally. Achenes fusiform or sometimes distinctly beaked, terete, ribbed or angulate or very rarely flattened, glabrous or variously setuliferous, commonly with twin hairs, or rarely tomentose with long tortuous hairs, or appearing papillate, very rarely with stalked and sticky glands (Adenocaulon); carpodopodium sometimes absent, more often usually a narrow annulus, sometimes cylindric; pappus sometimes absent but usually of uniseriate, sometimes biseriate to multiseriate, simple, barbellate, subplumose or plumose bristles, sometimes flattened or scalelike, persistent or deciduous, separate or sometimes basally connate.

About 80 genera and ca. 950 species: Africa, Asia, Australia, North and South America; nine genera (two endemic) and 73 species (50 endemic) in China.

Molecular evidence has proposed that a traditionally circumscribed Mutisieae is polyphyletic (Kim et al., Syst. Bot. 27: 598–609. 2002). The majority of the Mutisieae s.l. from China consists of Ainsliaea, Myripnois, and Pertaya, and these genera form a distinct clade (recently recognized as the tribe Pertyeae) nested above the Cardueae and the African Mutisieae. Gerbera and its allies (Leibnitzia and Piloselloides) and Adenocaulon are nested in the Mutisieae s.s. clade along with other taxa mostly from South America. Leucomeris and Nouelia are apparently closely related to some South American Mutisieae, recently recognized as the tribe Hyalidaee (Panero & Funk, Proc. Biol. Soc. Washington 115: 909–922. 2002; Panero & Funk, Molec. Phylogent. Evol. 47: 757–782. 2008). To allow easy comparison with FRPS, a conservative concept of the Mutisieae s.l. is followed in the treatment below.


1a. Shrubs or small trees; style branches glabrous.
   2a. Capitula solitary; florets heteromorphic ................................................................. 1. Novelia
   2b. Capitula in a dense terminal cyme or glomerule; florets homomorphic ............................... 2. Leucomeris
1b. Shrubs, subshrubs, or perennial herbs; style branches with short hairs or papillae.
   3a. Achenes apically stipitate glandular; pappus absent ..................................................... 3. Adenocaulon
   3b. Achenes never glandular; pappus usually present.
      4a. Florets heteromorphic; perennial herbs.
         5a. Dimorphic herbs, with two (vernal and autumnal) phases in one year ......................... 4. Leibnitizia
         5b. Monomorphic herbs, with only one phase in one year.
            6a. Marginal female florets 1-seriate ........................................................................ 5. Gerbera
            6b. Marginal female florets 2-seriate ........................................................................ 6. Piloselloides
      4b. Florets homomorphic; shrubs or perennial herbs.
         7a. Pappus of plumose bristles or sometimes absent; usually perennial herbs .................... 7. Ainsliaea
         7b. Pappus of scabrid bristles; usually shrubs.
            8a. Phyllaries many, more than 3-seriate, unequal ..................................................... 8. Pertaya
            8b. Phyllaries few, 2- or 3-seriate, subequal ........................................................... 9. Myripnois

栌菊木属 lu ju mu shu

Gao Tiangang (高天刚); D. J. Nicholas Hind

Large shrubs to small trees. Leaves alternate, petiolate; leaf blade entire or minutely callosely serrulate. Capitula large, solitary, terminal, radiate, heterogamous; involucre campanulate; phyllaries multisierate, leathery, imbricate, unequal; receptacle flat to convex, alveolate. Florets all bisexual, fertile; marginal florets uniseriate, bilabiate, outer lip 3-toothed to 3-lobed at apex, inner 2-lobed, lobes linear, revolute; central florets many, tubular or slightly bilabiate, deeply 5-lobed, regularly or slightly irregularly, lobes revolute; anther bases long tailed, apex appendaged; styles shallowly divided at apex, style branches short, glabrous, apices obtuse to rounded. Achenes cylindric, ribbed, sericeous; pappus of scabrid bristles, numerous. $2n = 54^*$.  

- One species: China.


栌菊木 lu ju mu

Large shrubs to small trees, 3–4 m. Leaves evenly alternate; petiole 2–4 cm; leaf blade oblong to elliptic, 8–26 × 3.5–12 cm, thinly leathery, abaxially tomentose, adaxially glabrous, base obtuse to rounded, margin minutely callosely serrulate, apex obtuse to acuminate. Capitula solitary, large, erect, terminal, radiate, ca. 5 cm in diam.; involucre 2–2.5 cm in diam.; phyllaries ca. 7-seriate, abaxially tomentulose, outer phyllaries shorter, ovate-triangular, 3–5 mm, median phyllaries oblong, ca. 1.5 cm, inner phyllaries lanceolate or linear, 2–2.5 cm. Marginal florets 1-seriate, corollas white, bilabiate, outer lip ca. 1.5 cm; central florets many, deeply 5-lobed, lobes ca. 8 mm; anther tails ca. 2 mm. Achenes 1.2–1.4 cm; pappus ca. 1.5 cm. Fl. Feb–Jun. $2n = 54^*$.  

- Forests, scrub, steep slopes in ravines; 1000–2900 m. SW Sichuan, Yunnan.


白菊木属 bai ju mu shu

Gao Tiangang (高天刚); D. J. Nicholas Hind

Shrubs or small trees. Leaves alternate, petiolate; leaf blade entire or sparsely serrulate. Capitula in a dense terminal cyme or in a dense many-headed terminal glomerule, homogamous; involucre obconic; phyllaries multisierate, imbricate; receptacle flat. Florets few, all bisexual, fertile, tubular, corolla deeply 5-lobed, lobes equal or subequal, revolute; anther bases tailed, apex appendaged; styles shallowly divided at apex, style branches short, glabrous, apices obtuse. Achenes cylindric, ribbed, sericeous; pappus of scabrid bristles, 2- or 3-seriate, outer shorter. $2n = 54$.  

Two species: China, India, Myanmar, Nepal, Pakistan, Thailand, Vietnam; one species in China.


白菊木 bai ju mu

Gochnatia decora (Kurz) Cabrera.

Small trees, (1–)3–8(–10) m. Leaves alternate; petiole 1.5–4 cm; leaf blade elliptic or oblong-lanceolate, 6–26 × 2.5–10 cm, papery, abaxially tomentose, adaxially glabrate, base cuneate, often unequal, margin repand, with sparse minutely callose serraes, apex acute, obtuse, or mucronate. Capitula in a dense 6–14-headed terminal glomerule, 8–10 mm in diam.; involucre 4–7 mm in diam.; phyllaries 6–8-seriate, outer phyllaries ovate, shorter, 1.5–4 mm, lanuginous, median phyllaries broadly ovate or ovate-lanceolate, ca. 6 mm, sparsely lanuginous, inner phyllaries narrowly oblong or linear, 13–15 mm, glabrous. Hysteranthous florets 5–7, corollas white, deeply 5-lobed, lobes 7–8 mm; anther tails ca. 3 mm. Achenes 1–1.2 cm; pappus light red or straw-colored yellowish, 1.3–1.5 cm. Fl. Mar–Apr. $2n = 54$.  

- Forests, forest margins, scrub; 1000–1900 m. S and W Yunnan [Myanmar, Thailand, Vietnam].


和尚菜属 he shang cai shu

Chen Yousheng (陈又生); D. J. Nicholas Hind

Herbs, perennial, from creeping rhizomes, aerial stems usually proximally tomentose and distally stipitate glansular. Leaves simple, alternate, basal and cauline, petiolate (proximal) or sessile (distal); blades ovate to triangular or suborbicular, abaxially tomentose, adaxially glabrate, bases mostly truncate to cordate or hastate, margins coarsely dentate or lobulate to denticate or entire. Synflorescences of lax panicles. Capitula disciform; involucre campanulate; phyllaries 5–7, 1- or 2-seriate, subequal, ovate to oblong, herbaceous, apices obtuse; receptacles convex, smooth, glabrous, epaleate. Marginal florets female, corollas white or ochroleucous, unequally and deeply 5-lobed; disk florets functionally male, corollas white or ochroleucous, 5-lobed, actinomorphic, corolla tube longer; anther basal appendages (relatively short) entire, apical appendages narrowly triangular; style undivided, style
Herbs, perennial, from creeping rhizomes. Stems erect, 30–100 cm tall, arachnoid, with stipitate glands on upper portion. Leaves radical and cauline; radical leaves withering before flowering; lower leaf blade broadly ovate or reniform, 7–13 × 30–100 cm, white lanuginous; leaf blade oblanceolate or obovate-oblong, 6–7 mm, stipitate glandular. Fl. Jun–Aug, fr. Sep–Nov. 2n = 46.

Forests, thickets, grassy slopes, stream-sides; below 3400 m. Anhui, Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Jiangxi, Jilin, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang [India, Japan, Korea, Nepal, Russia].

Six species: Bhutan, China, India, Japan, Korea, Nepal, Pakistan, Russia; Central and North America (Guatemala, Mexico, United States); four species in China.

1a. Pappus white to dark white or light brown, never violet-purple.

2a. Vernal capitula appearing simultaneously with leaves ............................................................ 1. Leibnizia anandria

2b. Vernal capitula appearing shortly before leaves ........................................................................ 2. Leibnizia pusilla

1b. Pappus orange-colored to dark yellow or violet-purple, never white.

3a. Achenes rostrate ...................................................................................................................... 3. Leibnizia ruficoma

3b. Achenes beakless .................................................................................................................... 4. Leibnizia nepalensis


大丁草 萼

Herbs, perennial. Leaves rosulate, appearing before or with first capitula; leaf blade entire, pinnatifid, or lyrate. Scapes 1–11, bracteate, slender throughout. Capitula terminal on scape, radiate, heterogamous, appearing twice (spring and autumn) in one year, dimorphic, chasmogamous or cleistogamous; involucres obconic, cylindric, or campanulate; phyllaries 3- or 4-serial, imbricate; receptacles flat to slightly convex, foveolate to alveolate, glabrous, epaleate. Vernal florets chasmogamous, all fertile, marginal uniseriate, bilabiate, with obvious laminae, outer lip 3-toothed at apex, inner 2-lobed, lobes linear; central florets many, bisexual, bilabiate (tubular), laminae reduced. Autumnal florets cleistogamous, all fertile, marginal uniseriate, bilabiate (raylike), with obvious laminae, outer lip 3-toothed at apex, inner lobes strongly reduced; central florets many, bisexual, bilabiate, narrowly tubular, lobes very short, nearly actinomorphic; anther bases long tailed, apex appendages lanceolate; styles shallowly divided at apex, style branches short, abaxially pilose, apices rounded to truncate. Achenes fusiform, sometimes beaked, ribbed, strigose; pappus of fine bristles. 2n = 42, 46, 92.

About five species: E Asia, Central, North, and South America; one species in China.


大丁草属 萼

Gao Tiangang (高天刚); D. J. Nicholas Hind

Herbs, perennial. Leaves radical and cauline; leaf blade broadly ovate or reniform, 2.5 × 5 mm; phyllaries 5–7, 1-serial, ovate, 2.5–3 × 1.5–2.3 mm, reflexed after flowering; receptacle convex, glabrous. Marginal florets female, 6–12, corollas white, tubular, 1.1–1.5 mm, glabrous, 4- or 5-lobed at apex; disk florets male, 4–12(–22), corollas white, 1.7–2 mm, glabrous, 5-lobed at apex; anther connective rounded at apex, scarcely projecting. Achenes clavate-obovate, 6–7 mm, stipitate glabrous. Fl. Jun–Aug, fr. Sep–Nov. 2n = 46.

Six species: Bhutan, China, India, Japan, Korea, Nepal, Pakistan, Russia; Central and North America (Guatemala, Mexico, United States); four species in China.

1. Adenocaaulon adhaerescens Maximowicz; A. bicolor Hooker var. adhaerescens (Maximowicz) Makino.

Herbs, perennial, from creeping rhizomes. Stems erect, 20: 64. 1846. branched papillate outside. Achenes clavate to obovoid, not beaked, obscurely ribbed, covered with stout red stipitate glands, glands densest in upper half, achenes of inner florets usually glabrous; carpodium annular; pappus absent. 2n = 42, 46, 92.


Adenocaaulon adhaerescens Maximowicz; A. bicolor Hooker var. adhaerescens (Maximowicz) Makino.

Herbs, perennial, from creeping rhizomes. Stems erect, 30–100 cm tall, arachnoid, with stipitate glands on upper portion. Leaves radical and cauline; radical leaves withering before flowering; lower leaf blade broadly ovate or reniform, 7–13 × 11–22 cm, whitish arachnoid abaxially, subglabrous adaxially, base deeply cordate, margin irregularly toothed, apex subacute or obtuse; petioles 10–20 cm, winged; median and upper leaves gradually smaller, winged petiolate; uppermost leaves broadly lanceolate, becoming bracteate. Capitula ca. 5 mm in diam.; p Peduncles 2–6 cm, stipitate glandular; involucres subglobose, ca. 2.5 × 5 mm; phyllaries 5–7, 1-serial, ovate, 2.5–3 × 1.5–2.3 mm, reflexed after flowering; receptacle convex, glabrous. Marginal florets female, 6–12, corollas white, tubular, 1.1–1.5 mm, glabrous, 4- or 5-lobed at apex; disk florets male, 4–12(–22), corollas white, 1.7–2 mm, glabrous, 5-lobed at apex; anther connective rounded at apex, scarcely projecting. Achenes clavate-obovate, 6–7 mm, stipitate glabrous. Fl. Jun–Aug, fr. Sep–Nov. 2n = 46.

Six species: Bhutan, China, India, Japan, Korea, Nepal, Pakistan, Russia; Central and North America (Guatemala, Mexico, United States); four species in China.

1a. Pappus white to dark white or light brown, never violet-purple.

2a. Vernal capitula appearing simultaneously with leaves ............................................................ 1. L. anandria

2b. Vernal capitula appearing shortly before leaves ........................................................................ 2. L. pusilla

1b. Pappus orange-colored to dark yellow or violet-purple, never white.

3a. Achenes rostrate ...................................................................................................................... 3. L. ruficoma

3b. Achenes beakless .................................................................................................................... 4. L. nepalensis


大丁草 萼

Tussilago anandria Linnaeus, Sp. Pl. 2: 865. 1753; Anandra laeves Gardener; Gerbera anandria (Linnaeus) Schultz Bipontinian; G. anandria var. densifolia Mattfeld; G. anandria var. densifolia Mattfeld; G. anandria var. integripetala (Hayata) Yamamoto; G bonaniana (Beauverd) Beauverd f. carvalieri (Vaniot & H. Lévèillé) H. Lévèillé; G carvalieri Vaniot & H. Lévèillé; G integripetala Hayata; G pterodonta Y. C. Tseng; Perdicium anandria (Linnaeus) R. Brown; P. tomentosum Thuernberg.

Herbs, perennial, dimorphic; rhizome covered by marcescent petiole. Vernal phase: leaves in basal rosette; petiole 2–4 cm, white lanuginous; leaf blade oblongate or obovate-oblong, 2–6 × 1–3 cm, papery, abaxially arachnoid lanate, adaxially subglabrous, base attenuate, obtuse, subtruncate, or shallowly cordate, margin denticulate, sinuate, runcinate, apex mucronate. Scapes 1 or tufted, 5–20 cm, arachnoid lanate; bracts many, subulate or linear, 6–7 mm. Capitula solitary, terminal, radiate, 1–1.5 cm in diam.; involucres obconic; phyllaries ca. 3-serial, abaxially lanuginous, outer phyllaries linear, ca. 4 mm, inner phyllaries linear-lanceolate, ca. 8 mm. Marginal female florets bilabiate, outer lips oblong, adaxially white, abaxially pink, or both surfaces pink, 3–8 × 1–1.5 mm, inner lips filiform, 1.5–2 mm, coiled; central bisexual florets many, bilabiate, tubular, corolla 6–8 mm, outer lips oblong, ca. 3 mm, inner lips 2.5–3 mm. Achenes fusiform, 5–6 mm, hairy; pappus
dark white, 5–7 mm. Fl. Mar–Jul. Autumnal phase: leaves in basal rosette; petiole 2.5–8.5–(25) cm, arachnoid ligneous; leaf blade ovate or ovate-lanceolate, 6–15 × 4–6.5 cm, papery, abaxially arachnoid lanate, adaxially subglabrous, base attenuate, subtruncate, or shallowly cordate, margin denticulate or sinuate, apex mucronate. Scapes 1 or tufted, 15–35 cm, arachnoid lanate; bracts many, subulate or linear, 1–1.5 cm. Capitula solitary, terminal, radiate, 1.5–2 cm in diam.; involucral campanulate; phyllaries ca. 3-seriate, abaxially lanuginous, outer phyllaries linear, 5–6 mm, inner phyllaries linear, 15–16 mm. Florets cleistogamous, closed, marginal florets female, 1-seriate, bilabiata, tubular, corolla ca. 8 mm; central bisexual florets many, bilabiata, tubular, corolla ca. 7 mm. Achenes fusiform, 7–9 mm, hairy; pappus dark white, 11–12 mm. Fl. Aug–Nov. 2n = 46.

Mountain slopes, summits, or valleys; 600–2600 m. Throughout China except Xinjiang and Xizang [Japan, Korea, Russia (Sakhalin, Siberia)].

This is a very variable species, especially in the leaf morphology.


Herbs, perennial, dimorphic; rhizome covered by marcescent leaf sheath. Vernal phase: leaves in rosette, appearing after capitula, subsessile; leaf blade lanceolate, to 12 × 5 mm, papery, abaxially arachnoid lanate, adaxially glabrous, base attenuate or subtruncate, margin denticulate, repand, or runcinate, apex obtuse, rounded, or mucronate. Scapes 1 or tufted, 3–12 cm, arachnoid lanate; bracts many, narrowly lanceolate, 3–6 mm. Capitula solitary, terminal, radiate, 0.8–1.2 cm in diam.; involucral broadly campanulate; phyllaries ca. 3-seriate, oblong, abaxially lanuginous, outer phyllaries ca. 4 mm, inner phyllaries 8–11 mm. Marginal female florets bilabiata, outer lips oblong, ca. 5 mm, inner lips filiform, ca. 4 mm; central bissexual florets many, bilabiata, tubular, corolla 4.5–7 mm. Achenes terete, 3–6 mm, pubescent; pappus white or dark white, 4–6 mm. Fl. Apr–Jun. Autumnal phase: leaves in rosette, appearing after capitula; petiole 1.5–3.5 cm, lanuginous; leaf blade elliptic-oblong or ovate, 3–10 × 1.5–3.5 cm, base subcordate, subtruncate, or attenuate, margin sinuate or crenate, apex rounded or obtuse. Scapes 1 or tufted, 10–30 cm, lanuginous; bracts many, subulate, linear or filiform, 1–2 cm. Capitula solitary, terminal, ca. 2 cm in diam.; involucral campanulate; phyllaries 3- or 4-seriate, outer phyllaries subulate to linear, 7–13 mm, inner phyllaries lanceolate to oblong or filiform, 1.4–2 cm. Florets cleistogamous, closed, marginal florets female, 1-seriate, bilabiata, tubular, corolla 4–13 mm; central bissexual florets many, bilabiata, tubular, as long as female floret. Achenes fusiform, 6–7 mm; pappus dark white, 9–11 mm. Fl. Jul–Oct.

Forests, on rocks; 2400–3600 m. Guizhou, Qinghai, Sichuan, Xizang, Yunnan [Bhutan, Nepal].


Herbs, perennial, dimorphic. Vernal phase: no specimens in good state were seen; most specimens are in autumnal phase. Autumnal phase: leaves in rosette, rhizome covered by marcescent fibrous leaf sheath; petiole 4–6 cm, narrowly winged, ± lanuginous; leaf blade oblong or spatulate-oblong, 7–11 × 2–3.5 cm, papery, abaxially densely white lanuginous, adaxially glabrescent, base attenuate, decurrent, margin undulate-runcinate, apex rounded or obtuse. Scapes 1 or sometimes 2, 30–52 cm, arachnoid lanuginous; bracts subulate, 0.5–2 cm. Capitula solitary, terminal, ca. 2 cm in diam.; involucral campanulate; phyllaries 2- or 3-seriate, outer phyllaries linear-subulate, 5–7 mm, inner phyllaries linear, ca. 2.2 cm. Florets cleistogamous, closed, marginal florets female, 1-seriate, bilabiata, outer lips oblong, ca. 1.5 mm, inner lips filiform, reduced; central bisexual florets many, bilabiata, tubular, corolla ca. 5 mm. Achenes fusiform, attenuate into long beak at apex, ca. 9 mm (including beak), pilose, ribbed; pappus orange-colored to dark yellow, ca. 9 mm. Fl. Aug–Sep.

Pinus forests, mountain slopes; 2200–2500 m. Sichuan, Xizang, Yunnan [Bhutan, Nepal].


尼泊尔大丁草 ni bo er da ding cao


Herbs, perennial, dimorphic; rhizome covered by marcescent leaf sheath. Vernal phase: puny, leaves in rosette, rhizome covered by marcescent fibrous leaf sheath; petiole 2–4 cm; leaf blade ovate, 0.8–2 × 1–1.5 cm, papery, abaxially densely white lanuginous, adaxially glabrous, base truncate or slightly decurrent, margin sparsely denticate, apex rounded or mucronate. Scapes 1 or tufted, 4.5–7 cm, arachnoid; bracts 2 or 3, subulate, ca. 5 mm. Capitula solitary, terminal, ca. 1 cm in diam.; involucral campanulate; phyllaries ca. 3-seriate, outer phyllaries lanceolate, 4–5 mm, inner phyllaries ovate, 9–10 mm. Florets chasmogamous, marginal female florets 1-seriate, bilabiata, outer lips ovate-lanceolate to oblong, ca. 4.5 mm, inner lips filiform, reduced; central bisexual florets many, bilabiata, tubular. Achenes (immature) terete, ca. 6 mm, sparsely pubescent, ribbed; pappus dark purple, ca. 4 mm. Fl. Jun–Jul. Autumnal phase: larger than vernal phase, leaves in rosette, rhizome covered by marcescent fibrous leaf sheath; petiole 5–7 cm, ± lanuginous; leaf blade spatulate to oblong or lyrate, 6–7 × 2–3 cm, papery, abaxially white lanuginous, adaxially glabrous,
base decurrent, margin crenate or undulate, apex rounded or mucronate. Scapes 1 or tufted, 6–35 cm, lanuginous; bracts linear-subulate, ca. 2 cm. Capitula solitary, terminal, ca. 2 cm in diam.; involucre campanulate; phyllaries 3-seriate, outer phyllaries linear-subulate, ca. 6 mm, inner phyllaries oblong, 1.3–2.2 cm. Florets cleistogamous, closed, marginal florets female, 1-seriate, bilabiate, outer lips oblong, ca. 1 mm, inner lips filiform, reduced; central bisexual florets many, bilabiate, tubular, corolla as long as female florets. Achenes fusiform, ca. 5 mm, pilose, apex tapering; pappus violet-purple, 6–7 mm. Fl. Jul–Sep.

Grassy open areas, scrub, forest margins; 3200–4600 m. Sichuan, Xizang, Yunnan [Bhutan, India, Nepal, Pakistan].

5. **GERBERA** Linnaeus, Opera Var. 247. 1758, nom. cons.

火石花属  huo shi hua shu

Gao Tiangang (高天刚); D. J. Nicholas Hind

*Berniera* Candolle; *Lasiopus* Cassini; *Oroseris* Candolle.

Herbs, perennial, rhizomatous. Leaves rosulate; leaf blade oblanceolate, oblong, obovate, ovate, or subcircular, papery, herbaceous, or leathery, serrulate, dentate, repand, pinnatifid, or pinnatisect. Scapes 1, rarely many, slender, ebracteate or with few to many bracts. Capitula terminal, radiate, heterogamous, chasmogamous; involucre oblong to broadly campanulate; phyllaries multiseriate, imbricate; receptacles flat, alveolate, glabrous, epaleate. Florets all fertile, marginal uniseriate, female, bilabiate, tubular, corolla ca. 8 mm. Achenes fusiform, ca. 5 mm, pilose. 2n = 46, 50.

About 30 species: Africa, Asia; seven species (four endemic) in China.

There are no species of *Gerbera* in South America. The position of *G. hieracioides* (Kunth) Zardini is disputed. Based on *Onoseris hieracioides* Kunth, it probably belongs in *Leibnizia* (known from both Asia and Central and North America) or *Chaptalia* Ventenat, having previously been transferred to *Trichocline* Cassini, as *T. hieracioides* (Kunth) Ferreyra.

*Gerbera jamesonii* Bolus is cultivated in China.

1a. Outer female florets without obvious limbs, tubular ................................................................. 1. *G. maxima*

1b. Outer female florets with obvious limbs.

2a. Capitula nodding; scapes ebracteate or 1- or 2-bracteate; achenes glabrous.

3a. Outer phyllaries ca. 1 mm wide, innermost ca. 3 mm wide, apices acuminate; outer lips of female florets narrow, 3–4 mm wide; staminode apices erect ................................................................. 2. *G. nivea*

3b. Outer phyllaries ca. 2.5 mm wide, innermost 6–7 mm wide, apices mucronate; outer lips of female florets wide, 6–8 mm wide; staminode apices hamate ............................................. 3. *G. latiligulata*

2b. Capitula erect; scapes multibracteate; achenes pilose.

4a. Phyllary apices acute, acuminate, or mucronate.

5a. Leaf blade and petiole glabrous ................................................................................................. 4. *G. raphanifolia*

5b. Leaf blade abaxial surface densely lanuginous, petiole arachnoid lanate ................................ 5. *G. delavayi*

4b. Phyllary apices rounded or obtuse.

6a. Leaf blade ovate-oblong to oblong, 17–29 cm, 7–14 cm wide; involucre 4.5–5 cm in diam., phyllaries obviously unequal, apices green, mucronate or subobtuse, innermost obtlong ............................................. 6. *G. rupicola*

6b. Leaf blade broadly ovate or suborbicular, equally wide and long, 5–10 cm; involucre ca. 2.5 cm in diam., phyllaries subequal, apices rufous, rounded ................................................. 7. *G. tanantii*


箭叶火石花  jian ye huo shi hua


Herbs, perennial; rhizome lanuginous. Leaves in basal rosette; petiole 19–30 cm, lanuginous; leaf blade ovate-lanceolate, 11–20 × 5–9 cm, sometimes with few small lobes at base, papery, abaxially densely white lanuginous, adaxially glabrous, base cordate-sagittate, margin irregularly denticulate, apex acuminate. Scapes 1 or 2, ca. 43 cm or longer, ebracteate, lanuginous. Capitula solitary, terminal, radiate, 2.5–3 cm in diam.; involucre broadly campanulate; phyllaries ca. 4-seriate, outer phyllaries linear-subulate, ca. 1 cm, inner phyllaries linear, ca. 2 cm. Marginal female florets bilabiate, tubular, corolla ca. 8 mm, inner lips oblong, ca. 4 mm; central bisexual florets many, bilabiate, tubular, corolla ca. 8 mm. Achenes (immature) ca. 8 mm, subglabrous, ribbed; pappus whitish tawny, ca. 1 cm. Fl. Aug–Sep.

Forest margins; ca. 2300 m. Xizang [Bhutan, India, Nepal, Pakistan, Thailand].

白背火石花  bai bei huo shi hua

*Oreoseris nivea* Candolle, Prodr. 7: 18. 1838.

Herbs, perennial; rhizome glabrous. Leaves in basal rosette; petiole 1–4 cm, lanuginous; leaf blade obovate-spatulate, 3.5–9 × 1–2.7 cm, papery, abaxially gray lanuginous, adaxially glabrous, base attenuate, margin pinnatilobate to pinnatisect, apex obtuse to acuminate. Scapes 15–25 cm, arachnoid lanuginous; bracts absent or 1 or 2, subulate, ca. 1 cm. Capitula solitary, nodding, terminal, radiate, 2.5–3 cm in diam.; involucre campanulate; phyllaries 4-seriate, outer phyllaries subulate, ca. 1 cm × 1 mm, base lanuginous, innermost phyllaries oblong-lanceolate, ca. 2 cm × 3 mm. Marginal female florets bilabiate, outer lips light red, long elliptic, 14–15 × 3–4 mm, inner lips ca. 8 mm, coiled, staminode apices erect; central bisexual florets many, white, bilabiate. Achenes fusiform, ca. 5 mm, glabrous, multiribbed; pappus yellow-white, 8–10 mm. Fl. Aug–Sep.

Alpine meadows, forest margins; 3300–4100 m. W Sichuan, S Xizang, NW Yunnan [Brutain, India, Nepal].


阔舌火石花  kuo she huo shi hua

Herbs, perennial; rhizome glabrous. Leaves in basal rosette; petiole 3–7 cm, subglabrous; leaf blade obovate-lanceolate or obvate-oblong, 5–9 × 1.5–2 cm, papery, abaxially gray lanuginous, adaxially glabrous, base attenuate, margin pinnatilobate, apex obtuse to acuminate. Scapes 10–25 cm, arachnoid lanuginous; bracts 1 or 2, linear, ca. 1 cm. Capitula solitary, nodding, terminal, radiate, ca. 4 cm in diam.; involucre broadly campanulate; phyllaries 4-seriate, arachnoid lanate at least at apices, outer phyllaries lanceolate, 0.8–1 cm × ca. 2.5 mm, innermost phyllaries oblong-lanceolate, 2–2.5 cm × 6–7 mm. Marginal female florets bilabiate, outer lips light yellow, elliptic, 18–20 × 6–8 mm, inner lips ca. 1.2 cm, coiled, staminode apices hamate; central bisexual florets many, bilabiate, corolla ca. 1.3 cm. Achenes fusiform, ca. 5 mm, glabrous, multiribbed; pappus yellow-white, 8–10 mm. Fl. Sep.

- Rock fissures. Yunnan (Qiaojia).


光叶火石花  guang ye huo shi hua

Herbs, perennial; rhizome fulvous lanuginous. Leaves in basal rosette; petiole 10–15 cm, glabrous; leaf blade oblong or oblong-lanceolate, 15–27 × 6–11 cm, papery, both surfaces lanuginous, base attenuate, margin runcinate, apex mucronate. Scapes 30–62 cm, arachnoid lanate; bracts many, subulate, 1–1.5 cm. Capitula solitary, erect, terminal, radiate, 2.5–4 cm in diam.; involucre campanulate; phyllaries 4- or 5-seriate, outer phyllaries linear, ca. 8 mm, sparsely tomentose, inner phyllaries oblong, 1.6–1.9 cm, glabrous. Marginal female florets bilabiate, outer lips light red, strap-shaped, ca. 13 × 2.5 mm, inner lips 6–8 mm; central bisexual florets many, white, bilabiate. Achenes terete, ca. 5 mm, pilose; pappus brownish, ca. 1.2 cm. Fl. Oct–Nov.

- Forests; ca. 2700 m. NW Yunnan.

5. **Gerbera delavayi** Franchet, J. Bot. (Morot) 2: 68. 1888.

火石花  huo shi hua

Herbs, perennial; rhizome white lanuginous. Leaves in basal rosette; petiole 1.5–7 cm, arachnoid lanate; leaf blade lanceolate, oblong-lanceolate, or ovate-oblong to ovate, 6–16 × 3–10 cm, leathery, abaxially white lanuginous, adaxially glabrescent, base truncate or subcordate, margin repand, apex obtuse or mucronate. Scapes many, sometimes solitary, 10–45 cm, arachnoid lanate; bracts many, linear-subulate or subulate, 0.5–1.5 cm. Capitula solitary, erect, terminal, radiate, 2–3.5 cm in diam.; involucre turbinate-campanulate; phyllaries 4- or 5-seriate, outer phyllaries subulate, 6–15 mm, inner phyllaries lanceolate, 1.5–4.5 cm. Marginal female florets bilabiate, outer lips light red, oblong to narrowly elliptic, 13–15 × 3–3.5 mm, inner lips 8–9 mm; central bisexual florets many, bilabiate, corolla 1–1.5 cm. Achenes terete, 3–3.5 mm, ptilose, ribbed; pappus yellow-white, 1–1.3 cm. Fl. Oct–Apr.

Open places, mountain slopes, forest margins, forests; 1800–3200 m. Guizhou, Sichuan, Yunnan [N Vietnam].

1a. Leaf blade lanceolate or oblong-lanceolate

- Leaf blade ovate to ovate-oblong

1b. Leaf blade ovate to ovate-oblong

5a. **Gerbera delavayi** var. delavayi

火石花(原变种)  huo shi hua (yuan bian zhong)

*Gerbera uncinata* Beauverd.


Open places, mountain slopes, forest margins; 1800–3200 m. Sichuan, Yunnan [N Vietnam].


蒙自火石花  meng zi huo shi hua


Leaf blade ovate to ovate-oblong.

- Mountain slopes, forest margins, forests; 1800–3200 m. Guizhou, Yunnan.

6. **Gerbera rupicola** T. G. Gao & D. J. N. Hind, nom. nov.

巨头火石花  ju tou huo shi hua


Herbs, perennial. Leaves in basal rosette; petiole 5–10 cm, white lanuginous; leaf blade ovate-oblong or oblong, 17–29 × 7–14 cm, papery, abaxially densely lanuginous, adaxially lanuginous, base cordate, margin repand, apex mucronate. Scapes solitary, 17–40 cm, densely white lanuginous; bracts many, subulate, ca. 1.3 cm, abaxially lanuginous. Capitula solitary, erect, terminal, radiate, 5.5–7 cm in diam.; involucre broadly campanulate, 4.5–5 cm in diam.; phyllaries 4- or 5-
Herbs, perennial. Leaves in basal rosette; petiole longer than blade; leaf blade suborbicular, 5–10 × 5–10 cm, thickly papery, abaxially densely lanuginous, base broadly cordate, margin sinuate, apex obtuse or mucronate. Scapes 30–40 cm; bracts lanceolate. Capitula terminal, solitary, radiate; involucre ca. 2.5 cm in diam.; phyllaries 4-seriate, subequal, abaxially lanuginous, apices rounded and rufous. Marginal female florets bilabiata, corolla ca. 3 cm; central bisexual florets bilabiata. Achenes (immature) hairy; pappus white. Fl. unknown.

- Yunnan.


*Gerbera tanantii* Franchet, J. Bot. (Morot) 7: 155. 1893.

Herbs, perennial. Leaves rosulate; leaf blade ovate to oblong, entire. Synflorescence scapose, 1 to many per plant, ebracteate, expanded below capitula. Capitula terminal, radiate, heterogamous, chasmosagamous; phyllaries 2-seriate; receptacles flat, alveolate, glabrous, ebracteate. Florets all fertile, marginal 2-seriate, female, bilabiata, outer series with obvious limb, outer lip 3-denticulate at apex, inner shallowly 2-lobed, lobes filiform, coiled, inner female florets tubular, without obvious limb, outer lip 3-toothed at apex, inner deeply 2-lobed; central florets numerous, bisexual, bilabiata (tubular), outer lips 3-toothed at apex, inner deeply 2-lobed; anther bases long-tailed, apex appendages truncate; styles shallowly divided at apex, style branches short, papilllose. Achenes fusiform, long beaked, ribbed, finely bristly; pappus of fine bristles.

Two species: Africa, Asia, Australia; one species in China.


兔儿一枝箭 属 tu er yi zhi jian shu

Gao Tiangang (高天刚); D. J. Nicholas Hind


*Arnica hirsuta* Forsskål, Fl. Aegypt.-Arab. 151. 1775; *A. piloselloides* Linnaeus; *Gerbera amabilis* Hance; *G. hirsuta* (Forsskål) Lessing; *G. ovalifolia* Candolle; *G. piloselloides* (Linnaeus) Cassini.

Herbs, perennial; rhizome covered by marcescent petiole. Leaves in basal rosette; petiole longer than blade; leaf blade ovovate, obovate-oblong, or oblong, rarely ovate, 6–16 × 2.5–5.5 cm, papery, abaxially densely white arachnoid lanuginous, adaxially glabrate, base attenuate or obtuse, margin entire, ciliate, apex rounded. Scapes solitary or tufted, 15–30(–45) cm, densely tomentose, ebracteate. Capitula terminal, solitary, radiate, 2.5–4 cm in diam.; involucre disciform; phyllaries 2-seriate, linear or linear-lanceolate, outer phyllaries 8–11 mm, inner phyllaries 1.4–4.8 cm. Marginal florets 2-seriate, female, bilabiata, outer female florets with obvious limbs, corolla 1.6–1.8 cm, outer lip oblongate to spatulate-oblong, 3-denticulate at apex, inner shallowly 2-lobed, lobes filiform, coiled, inner female florets tubular, without obvious limbs, corolla 1–1.2 cm; central florets many, bisexual, bilabiata (tubular), corolla ca. 1.2 cm. Achenes fusiform, 4.5–6.5 mm, finely bristly, ribbed, long beaked, beak 7–8 mm; glabrous; pappus mandarin-red or brownish, ca. 1.1 cm. Fl. Feb–May and Aug–Dec.

Grassy open areas, forest margins, disturbed sites; 900–2400 m. Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Hunan, Jiangsu, Jiangxi, Sichuan, Xizang, Yunnan, Zhejiang [India, Indonesia, Japan, Laos, Myanmar, Nepal, Thailand, Vietnam; Africa, Australia].

7. **AINSLIAEA** Candolle, Prodr. 7: 13. 1838.

兔儿风属 tu er feng shu

Gao Tiangang (高天刚); Susana Edith Freire, D. J. Nicholas Hind

*Diaspananthus* Miquel.

Herbs, perennial, rarely subshrubs. Leaves alternate, often in basal rosettes or densely aggregated near median part of stems; blade linear, ovate, elliptic, or orbicular, margin entire, crenate, denticulate, dentate, or lobed. Capitula many in spikes, racemes, or panicles, sometimes nodding, radiate or discoid, homogamous; involucre cylindrical; phyllaries often multiseriate, imbricate; receptacle small, glabrous, ebracteate. Florets few, (1–)3(–5), bisexual, all fertile, chasmosagamous or cleistogamous; chasmosagamous corollas open, deeply irregularly 5-lobed, one of slits much longer than others, lobes linear, reflexed and usually coiled; cleistogamous corolla (if present) closed, tubular, shorter than pappus; anther bases long-tailed, apex appendages truncate to rounded, sometimes apiculate; styles shallowly divided at apex, style branches short, abaxially with papillae, apices obtuse to acute, rounded, or truncate. Achenes...
terete or fusiform, ribbed, glabrous or pilose; pappus of plumose bristles or sometimes absent in chasmogamous florets, usually uniseriate, more rarely biseriate. $2n = 24, 26$.

About 50 species: Afghanistan, Bangladesh, Bhutan, China, India, Indonesia, Japan, Korea, Myanmar, Nepal, Pakistan, Philippines, Thailand, Vietnam; 40 species (28 endemic) in China; one additional species is incompletely known.


1a. Subshrubs; stems much branched ............................................................. 1. *A. pertyoides*
1b. Perennial herbs; stems not branched.

2a. Leaves aggregated near or toward median part of stem or above basal part of stem.

3a. Capitula 1-flowered .......................................................................................... 2. *A. lancangensis*
3b. Capitula 2–4-flowered.

4a. Leaves lobed.

5a. Leaf blade shallowly pinnately lobed .............................................................. 3. *A. grossedentata*
5b. Leaf blade palmately lobed.

6a. Leaf blade 5–14 × 5.5–18 cm, shallowly 5–7-lobed ................................................. 4. *A. acerifolia*
6b. Leaf blade (1–)2.5–3.5 × (1–)2–3 cm, deeply lobed with apical lobe elongated .............. 5. *A. apiculata*

4b. Leaves not lobed.

7a. Leaf blade linear to elliptic or lanceolate (0.3–1.3 cm wide).

8a. Leaf blade linear to elliptic, 3–7 mm wide, apex acute, 1-veined .............................. 6. *A. walkeri*
8b. Leaf blade lanceolate, 5–13 cm wide, apex acuminate, 3-veined ........................... 7. *A. trinervis*

7b. Leaf blade lanceolate or ovate (1–12 cm wide).

9a. Petiole winged ..................................................................................................... 8. *A. foliosa*
9b. Petiole wingless.

10a. Leaf blade lanceolate, attenuate at base ...................................................... 7. *A. trinervis*
10b. Leaf blade ovate, rounded or cordate at base.

11a. Petiole densely strigose or villous.

12a. Capitula usually in spikes; florets 3 ............................................................... 9. *A. fragrans*
12b. Capitula in panicles; florets 3 or 4 ................................................................. 10. *A. asaroides*

11b. Petiole glabrous.

13a. Leaf blade 2–3.5(–7) cm, usually caerulescent, caerulescent-purple, or purplish green abaxially .................................................................................... 11. *A. gracilis*
13b. Leaf blade usually more than 4 cm, green abaxially.

14a. Achenes glabrous or pilose above; leaf margin entire to shallowly denticulate ................................................................. 12. *A. kawakamii*
14b. Achenes pilose; leaf margin usually dentate.

15a. Leaves aggregated near median part of stem .......................... 13. *A. macroclinidioides*
15b. Leaves above basal part of stem.

16a. Petiole broadly winged, leaf blade margin obscurely denticulate .................................................. 14. *A. smithii*
16b. Petiole wingless, leaf blade margin dentate ....................................... 15. *A. aptera*

2b. Leaves in basal rosette (rarely specimens with leaves above stem base in *A. apteroides*).

17a. Leaf blade uniformly narrowed at base ..................................................... 16. *A. mairei*
17b. Leaf blade abruptly narrowed into petiole.

18a. Leaves shortly petiolate (petioles 4–10 mm).

19a. Leaf blade lanceolate; achenes glabrous ......................................................... 17. *A. caesia*
19b. Leaf blade obovate to pandurate; achenes pilose .................................................. 18. *A. spicata*

18b. Leaves long petiolate (petioles more than 10 mm).

20a. Petiole wholly winged (more than 1.5 mm wide at upper point) or winged in upper half.

21a. Leaf base cordate .................................................................................................. 19. *A. bonatii*
21b. Leaf base rounded or attenuate.

22a. Involucre 12–18 mm.

23a. Anther appendages truncate; phyllaries and leaves pilose .......................... 20. *A. macrocephala*
23b. Anther appendages apiculate; phyllaries and leaves glabrous .................. 21. *A. gianiana*

22b. Involucre less than 10 mm (occasionally equal to 10 mm).

24a. Leaf margin straight, leaf base rounded, petiole wholly winged ................... 22. *A. latifolia*
24b. Leaf margin wavy, leaf base cuneate and commonly decurrent into petiole, petiole winged in upper half.

25a. Achenes glabrous or apically pilose .................................................................... 23. *A. henryi*
25b. Achenes pilose ................................................................................................. 24. *A. reflexa*
| 20b. Petiole wingless (leaf blade cuneate in *A. glabra*, *A. nervosa*, and *A. yunnanensis*). |
| 26a. Leaf margin dentate, blade obtuse to rounded at apex, discolorous, adaxial surface lanuginous and abaxial surface white tomentose .......... 25. *A. crassifolia* |
| 26b. Leaf margin entire to denticulate. |
| 27a. Capitula 2-flowered .................................................. 26. *A. elegans* |
| 27b. Leaf base rounded or cuneate. |
| 35a. Petiole densely strigose. |
| 35b. Petiole lanuginous or glabrous. |
| 36a. Leaf blade elliptic .................................................. 33. *A. angustata* |
| 36b. Leaf blade oblong to elliptic. |
| 37a. Leaf blade 8–12 cm .................................................. 34. *A. pingbianensis* |
| 37b. Leaf blade 3–7.5 cm .................................................. 35. *A. fulvipes* |
| 38a. Leaf blade elliptic, slightly fleshy, glabrous to subglabrous. |
| 38b. Leaf blade ovate. |
| 39a. Leaf blade broadly elliptic, (2–)3.5–10 mm wide, apex acute-acuminate ................................................. 36. *A. glabra* |
| 39b. Leaf blade linear-elliptic, 1–2.5 mm wide, apex acute ............. 37. *A. nervosa* |
| 40a. Achenes apically pilose .................................................. 38. *A. parvifolia* |
| 40b. Achenes pilose. |
| 41a. Leaf surface hairs T-shaped ........................................ 39. *A. yunnanensis* |
| 41b. Leaf surface hairs straight ......................................... 40. *A. chapaensis* |

1. **Ainsliaea pertyoides** Franchet, J. Bot. (Morot) 2: 70. 1888.

腋花兔儿风 *ye hua tu er feng*

Subshrubs, 0.5–1.2 m tall, much branched. Leaves alternate; petiole 2–5 mm, wingless, strigose; leaf blade ovate or ovate-lanceolate, cauline leaf blade 2.5–5.5 × 1–3 cm, subleathery, palmate-pinnate veined, abaxially villous or tomentose, adaxially glabrous, base cordate, margin entire to callose-denticulate, ciliate, apex acuminata. Capitula subsessile or shortly pedunculate, arranged in leafy panicles, 3-flowered; involucre cylindric, ca. 3 mm in diam.; phyllaries ca. 6-seriate, subleathery, abaxially glabrous or apically pubescent, outer phyllaries ovate, 2–3 mm, inner narrowly oblong to oblong, ca. 1.2 cm. Florets bisexual, chasmogamous, corollas white, tubular, ca. 1.6 cm, deeply 5-lobed, lobes unequal, anther appendages rounded. Achenes subfusiform, ca. 6 mm, ribbed, densely sericeous; pappus white, ca. 8 mm. Fl. Nov–Jan, Feb–Jun, Sep–Oct.

- Stream banks, rock fissures, moist areas in dense forests; 1700–2500 m. Guizhou, Sichuan, Yunnan.

1a. **Ainsliaea pertyoides var. pertyoides**

腋花兔儿风 (原变种) *ye hua tu er feng (yuan bian zhong)*

*Ainsliaea pertyoides f. sparsiflora* (Vaniot) Beauverd; *A. pertyoides var. sparsiflora* (Vaniot) H. Léveillé; *A. sparsiflora* Vaniot.


- Stream banks or moist areas in forests; 1500–2500 m. Guizhou, Sichuan, Yunnan.


白背兔儿风 *bai bei tu er feng*

*Ainsliaea ovalifolia* Vaniot; *A. pertyoides var. intermedia* Beauverd; *A. pertyoides f. ovalifolia* (Vaniot) Beauverd; *A. pteropoda* Candolle f. ovalifolia (Vaniot) H. Léveillé.


- Stream banks, rock fissures, moist areas in dense forests; 1700–2500 m. Guizhou, Sichuan, Yunnan.

澜沧兔儿风 lan cang tu er feng

Herbs, perennial, 40–70 cm tall. Leaves aggregated near median part of stem; petiole 1.5–3 cm, wingless; blade subrounded, palmatifid, 5.5–11 × 1.5–6 cm, papery, palmately veined, both surfaces green, abaxially sparsely villous, especially on midvein, axially subglabrous, base cordate, margin cleft or lobed, apex acute. Capitula shortly pedunculate, arranged in racemes, 3-flowered; involucre cylindric, ca. 3 mm in diam.; phyllaries 8- or 9-seriate, papery, axially sparsely puberulent, outer phyllaries ovate, 1–1.3 cm, inner oblong, 1–1.3 cm. Florets bisexual, chasmogamous, corollas tubular, 1.3–1.7 cm, deeply 5-lobed, lobes oblong, unequal, anther appendages apiculate. Achenes subfusiform, ca. 4 mm, glabrous; pappus light brownish, ca. 7 mm. Fl. Sep–Oct.


粗齿兔儿风 cu chi tu er feng

*Ainsliaea gracilis* Franchet var. *robusta* Diels.

Herbs, perennial, 25–60 cm tall. Leaves aggregated near median part of stem; petiole 3–7 cm, wingless; blade broadly ovate, ovate, or ovate-lanceolate, 3.4–7 × 2–5 cm, papery, palmate-pinnate veined, axially sparsely villous, adaxially sparsely strigose, base truncate, obtuse, or shortly attenuate, margin large dentate or sinuate, apex acute, rarely acuminate. Capitula shortly pedunculate, arranged in racemes, 3-flowered; involucre cylindric, ca. 3 mm in diam.; phyllaries ca. 6-seriate, papery, axially sparsely pubescent or glabrate, outer phyllaries broadly ovate, 1.5–2.5 mm, inner narrowly elliptic, ca. 1 cm. Florets bisexual, chasmogamous, corollas white, tubular, 1.6–1.7 cm, deeply 5-lobed, lobes linear-oblong, unequal, anther appendages truncate. Achenes subfusiform, ca. 4 mm, glabrous; pappus light brownish, ca. 7 mm. Fl. Sep–Oct.

● Forests; ca. 2000 m. Yunnan.

*Ainsliaea gracilis* var. *robusta* is treated here as a synonym of *A. grossedentata* on account of its leaf margins being shallowly pinnately lobed to dentate (vs. obscurely denticulate in *A. gracilis*).


槭叶兔儿风 mei ye tu er feng

*Ainsliaea acerifolia* var. *affinis* (Michel) Kitamura; *A. affinis* Miquel.

Herbs, perennial, 40–80 cm tall. Leaves aggregated near median part of stem; petiole 1.5–4 cm, wingless; leaf blade subrounded, palmatifid, 5–14 × 5.5–18 cm, papery, palmately veined, both surfaces green, abaxially sparsely villous, especially on midvein, axially subglabrous, base cordate, margin cleft or lobed, apex acute. Capitula subcapsule, arranged in spikes, 3-flowered; involucre cylindric, ca. 1 cm in diam.; phyllaries 8-seriate, subleathery, abaxially glabrous or apically pubescent, outer phyllaries broadly ovate or ovate, 1.5–3 mm, inner narrowly elliptic to narrowly oblong, 1.3–1.4 cm. Florets bisexual, chasmogamous, corollas tubular, ca. 1.6 cm, deeply 5-lobed, lobes oblong, unequal, anther appendages apiculate. Achenes terete, ca. 8 mm, glabrous; pappus red-brownish, ca. 10 mm. Fl. Jul.–Oct.

Forests; 300–500 m. Jiín, Liaoning [Japan, Korea].

This variety is quite different from *Ainsliaea acerifolia* var. *acerifolia*, found in Japan, in its leaf blades shallowly 5–7-lobed (vs. leaf blades deeply 7–9(–11)-lobed).


五裂兔儿风 wu lie tu er feng

*Ainsliaea liukiuensis* Beauverd; *A. macroclinidioides* Hayata var. *secundiflora* (Hayata) Kitamura; *A. secundiflora* Hayata.

Plants perennial, 8–30 cm tall. Leaves basally clustered; petiole 1.5–6 cm, wingless, strigose; leaf blade deeply palmately lobed, with apical lobe elongate (1–)2.5–3.5 × (1–)2–3 cm, papery, blackish green, pale opaque abaxially, slightly glossy adaxially, sparsely strigose on both surfaces; cauline leaves few, much reduced, alternate, short petiolate to sessile, ovate to ovate-lanceolate. Capitula subcapsule, arranged in spikes, 3-flowered; involucre narrowly obdeltate, ca. 3 mm in diam.; phyllaries 5- or 6-seriate, papery, glabrous, outer phyllaries ovate, ca. 2 mm, inner linear, ca. 10 mm. Florets bisexual, cleistogamous, corolla closed, tubular, minutely 5-lobed, 5–6 mm, hidden in pappus. Achenes narrowly oblong, ca. 5 mm, shortly pilose. Pappus ca. 9 mm. Fl. Feb–Mar, Aug–Oct.

Low hills, mountain slopes. Taiwan [Japan].

This variety is quite different from *Ainsliaea apiculata* var. *apiculata* and *A. apiculata* var. *ovatifolia* Masamune, both found in Japan, in its leaf blades deeply lobed with elongated apical lobe (vs. leaf blades 5-angled or shallowly 5-lobed in *A. apiculata* var. *apiculata* and ovate in *A. apiculata* var. *ovatifolia*).

*Ainsliaea secundiflora* was treated under *A. macroclinidioides* in FRPS (79: 60. 1996, as *A. macroclinidioides* var. *secundiflora*). However, analysis of the type specimen of *A. secundiflora* (Nakahara 922) confirms that it possesses leaves similar to those of *A. apiculata*, i.e., leaf blades palmately lobed (vs. not lobed in *A. macroclinidioides*).


华南兔儿风 hua nan tu er feng

Herbs, perennial, 20–40 cm tall. Leaves loosely aggregated near median part of stem; petiole 0.5–1.3 cm, narrowly winged; leaf blade oblong or linear, 3–7 × 0.3–0.7 cm, papery, apparently 1-veined, both surfaces glabrous, base long attenuate, margin sparsely denticulate, apex acuminate and mucronate. Capitula shortly pedunculate, arranged in panicles, (2 or)3-flowered; involucre cylindric, 2.5–3 mm in diam.; phyllaries ca. 5-seriate, papery, axially glabrous, outer phyllaries ovate, 1–2 mm, inner lanceolate, ca. 1 cm. Florets bisexual, chasmogamous, corollas white, tubular, 4–7.5 mm, deeply 5-lobed, lobes linear, unequal, anther appendages rounded to trun-
cate. Achenes terete, ca. 3 mm, densely pilose; pappus dark white, ca. 6 mm. Fl. Oct–Dec.

- Stream banks, moist areas in dense forests; below 700 m. SW Fujian, S Guangdong, S Guangxi.


三脉兔儿风 san mai tu er feng

**Ainsliaea macrocliniodes** Hayata var. **oblonga** (Koidzumi) Hatatsuma; **A. oblonga** Koidzumi.

Herbs, perennial, 30–60 cm tall. Leaves loosely aggregated near median part of stem; petiole 1–1.5 cm, wingless; leaf blade narrowly elliptic, narrowly lanceolate, or lanceolate, 5–9.5 × 0.5–2.5 cm, papery, apparently 3-veined, both surfaces glabrous, base attenuate, slightly decurrent, margin denticulate or obscurely denticulate, apex long acuminate. Capitula shortly pedunculate, arranged in panicles, 3-flowered; involucre cylindrical, 2–3 mm in diam.; phyllaries ca. 7-seriate, papery, abaxially glabrous, outer phyllaries ovate, 1–2 mm, inner narrowly elliptic, 1–1.2 cm. Florets bisexual, chasmogamous, corollas pink to white, tubular, ca. 9 mm, deeply 5-lobed, lobes oblong, unequal, anther appendages rounded to truncate. Achenes terete, ca. 3 mm, densely pilose; pappus dark yellow or yellow low, ca. 8 mm. Fl. Jul–Sep.

Stream banks, moist areas in dense forests; 600–900 m. N Fujian, Guangdong, Guangxi, SW Guizhou, S Jiangxi [Japan].

According to Freire (Ann. Missouri Bot. Gard. 94: 179. 2007), **Ainsliaea oblonga** is very close to **A. trinervis** but differs in having leaf blades lanceolate, 1–2.5 cm wide, with margin obscurely denticulate (vs. narrowly lanceolate, 0.5–1.3 cm wide, with margin denticulate in **A. trinervis**). Further studies will be necessary to determine whether or not they are conspecific.


异叶兔儿风 yi ye tu er feng

Herbs, perennial, 60–80 cm tall. Leaves loosely aggregated near median part of stem, sometimes alternate in median part of stem; petiole 2.5–5 cm, broadly winged; leaf blade ovate, ovate-lanceolate, or elliptic, 5–10 × 2–5 cm, papery, palmate-pinnate veined, both surfaces sparsely villous, base broadly cuneate or abruptly constricted into winged petiole, margin callose-denticulate, rarely repand, apex acute. Capitula subsessile or shortly pedunculate, arranged in racemes or spikes, 4- or 5-flowered; involucre cylindrical, 6–7 mm in diam.; phyllaries 4-seriate, subleathery, abaxially sparsely pubescent, sometimes glabrate when old, outer phyllaries broadly ovate, 2.5–3 mm, inner narrowly elliptic, 0.8–1.1 cm. Florets bisexual, chasmogamous and cleistogamous (at different seasons). Chasmogamous florets white, corollas 4-seriate, subleathery, abaxially sparsely pubescent, especially along veins, adaxially glabrous or sparsely pilose, base cordate, margin entire or sparsely callose-denticulate, ciliate, apex obtuse or mucronate extended from midvein. Capitula subsessile or shortly pedunculate, arranged in spikes (rarely panicles), 3-flowered; involucre cylindrical, 3–3.5 mm in diam.; phyllaries ca. 5-seriate, papery, abaxially glabrous, outer phyllaries ovate, 1.8–2 mm, inner narrowly elliptic, ca. 1.1 cm. Florets bisexual, chasmogamous and cleistogamous in same plant (or at different seasons). Chasmogamous florets white, corollas tubular, ca. 1 cm, deeply 5-lobed, lobes linear, unequal, anther appendages obtuse. Achenes terete or subfusciform, ca. 4 mm, ribbed, densely villous throughout or on upper part; pappus light brownish, ca. 7 mm. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 8 mm, hidden in pappus. Achenes ca. 5 mm; pappus ca. 12 mm. Fl. Sep–Dec.

Scrub, roadsides, grassy areas by stream banks; near sea level to 1300 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan].

**Ainsliaea asarifolia**, **A. integrifolia**, and **A. rubrifolia** are treated here as synonyms of **A. fragrans** because there is no diagnostic character to separate them as distinct taxa. All of these have petiolate leaves that are ovate to oblong, cordate at the base, with margins remotely callose-denticulate and lanuginous abaxially, especially on the veins. In addition, the differential character mentioned in the protologue of **A. rubrifolia**, i.e., leaves reddish green on the abaxial surface, is a variable feature throughout the range of **A. fragrans**.


杏香兔儿风 xing xiang tu er feng

**Ainsliaea asarifolia** Hayata; **A. cordifolia** Franchet & Savatier var. **integrifolia** Maximowicz; **A. fragrans** var. **integrifolia** (Maximowicz) Kitamura; **A. integrifolia** (Maximowicz) Makino; **A. ningpoensis** Matsuda; **A. rubrifolia** Franchet.

Herbs, perennial, 25–60 cm tall. Leaves in basal rosette or above stem base; petiole 1.5–10(–14) cm, wingless, striigose; leaf blade ovate to ovate-lanceolate, 2–11 × 1.5–5 cm, subleathery, palmate-pinnate veined, abaxially commonly purple, red villous, especially along veins, adaxially glabrous or sparsely pilose, base cordate, margin entire or sparsely callose-denticulate, ciliate, apex obtuse or mucronate extended from midvein. Capitula sub sessile or shortly pedunculate, arranged in spikes (rarely panicles), 3-flowered; involucre cylindrical, 3–3.5 mm in diam.; phyllaries ca. 5-seriate, papery, abaxially glabrous, outer phyllaries ovate, 1.8–2 mm, inner narrowly elliptic, ca. 1.1 cm. Florets bisexual, chasmogamous and cleistogamous in same plant (or at different seasons). Chasmogamous florets white, corollas tubular, ca. 1 cm, deeply 5-lobed, lobes linear, unequal, anther appendages obtuse. Achenes terete or subfusciform, ca. 4 mm, ribbed, densely villous throughout or on upper part; pappus light brownish, ca. 7 mm. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 8 mm, hidden in pappus. Achenes ca. 5 mm; pappus ca. 12 mm. Fl. Sep–Dec.

- Abies forests, scrub, stream banks; 2700–4300 m. W Sichuan, NE Yunnan.

- Riversides in forests; 600–700 m. Guangdong (Yangchun).


细辛叶兔儿风 xi xin ye tu er feng

Herbs, perennial, 20–80 cm tall. Leaves above stem base; petiole 2–13 cm, wingless, villous; leaf blade ovate to narrowly ovate, 3–11 × 2–7 cm, subleathery, palmate-pinnate veined, abaxially paler, villous along veins, adaxially glabrous, base cordate to subcordate, margin callose-denticulate, ciliate, apex acute to obtuse or mucronate extended from midvein. Capitula sub sessile or shortly pedunculate, arranged in panicles, 3- or 4-flowered; involucre cylindrical, ca. 2 mm in diam.; phyllaries ca. 6- or 7-seriate, papery, abaxially glabrous, outer phyllaries ovate, 1–2.5 mm, inner narrowly elliptic, 7–10 mm. Florets bisexual, chasmogamous, white, corollas tubular, ca. 6 mm, deeply 5-lobed, lobes linear, unequal, anther appendages obtuse. Achenes terete or subfusciform, ca. 4 mm, ribbed, villous; pappus brownish, ca. 5 mm. Fl. Jul–Oct, fr. Sep–Nov. 2n = 26*.
Ainsliaea asaroides is very close if not identical to A. fragrans. It may no longer be possible to maintain them as separate species when additional gatherings become available.


纤枝兔儿风  xian zhi tu er feng

Herbs, perennial, 20–60(–100) cm tall. Leaves aggregated near median part of stem; petiole 1.5–6 cm, wingless; leaf blade ovate or ovate-lanceolate, 2–6 × 1.2–3.4 cm, papery, paltome-pinnate veined, abaxially commony purplish red, sparsely vil-

lous, especially on veins, adaxially green, glabrous, base cor-
date or subcordate, slightly decurrent, margin callose-denticu-
late, apex acute to acuminata. Capitula shortly pedunculate, ar-

ranged in racemes, 3-flowered; involucrle cylindric, ca. 3 mm in
diam.; phyllaries ca. 7-seriate, papery, abaxially glabrous, out-

er phyllaries ovate, 1–2.5 mm, inner linear-oblancoaclate, 1–

1.2 cm. Florets bisexual, chasmogamous and cleistogamous in

the same plant. Chasmogamous floret corollas white, tubular, 1–1.3
cm, deeply 5-lobed, lobes linear-lanceolate, unequal, anther appen-
dages rounded. Achenes subclaviform, ca. 5 mm, glabrous or

apically pilose; pappus light red, 6–10 mm. Cleistogamous floret
corollas closed, tubular, minutely 5-lobed, ca. 5 mm, hid-

ded in pappus. Achenes ca. 5 mm; pappus ca. 8 mm. Fl. Sep–

Oct.

- Forests; 400–1600 m. Chongqing, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan.


灯台兔儿风  deng tai tu er feng

Ainsliaea hui Diels ex Mattfeld.

Herbs, perennial, 20–70 cm tall. Leaves clustered, above
stem base or crowded near midpoint of stem; petiole (2.5–)3.5–

8.5 cm, wingless; leaf blade ovate, 5–7(–9.5) × 3–6 cm, papery,
palmate-pinnate veined, abaxially paler than adaxial surface, adaxially subglabrous, base rounded or slightly cordate to

truncate, margin entire to denticulate, apex obtuse. Capitula

shortly pedunculate, arranged in spikes, 3-flowered; involucre canpanulate-cylindric, ca. 3 mm in diam.; phyllaries 5–7-

seriate, subleathery, glabrous, sparsely pilose above, outer phyllarys ovate, ca. 2.5 mm, inner linear, ca. 7.5 mm. Florets bi-

sexual, usually chasmogamous (occasionally cleistogamous in

same plant). Chasmogamous floret corollas white, tubular, ca.

13 cm, deeply 5-lobed, lobes linear-lanceolate, unequal, anther appen-
dages truncate. Achenes oblong, ca. 2.5 mm, glabrous or pilose above; pappus ca. 8 mm. Cleistogamous floret corollas

closed, tubular, minutely 5-lobed, ca. 4.5 mm, hidden in pappus.

Achenes ca. 6 mm; pappus ca. 9 mm. Fl. Sep–Nov.

- Forests; 600–1600 m. Anhui, Fujian, Guangdong, Hunan, Tai-

wan, Zhejiang.

This species and Ainsliaea macroclinidioides are closely related,

leaf blade margin slightly entire (vs. dentate) is the only difference be-
tween them. Further studies are needed to clarify the relationships and specific limits between these species.


阿里山兔儿风  a li shan tu er feng

Ainsliaea dentata Koidzumi; A. macroclinidioides var. okinawensis (Hayata) Kitamura; A. okinawensis Hayata; A. ovata Koidzumi; A. yadismae Koidzumi.

Herbs, perennial, 25–80 cm tall. Leaves aggregated near median part of stem; petiole 3–11 cm, wingless; leaf blade broadly ovate to deltate or ovate-lanceolate, 4.5–13 × 3–11 cm, papery, palmate-pinnate veined, abaxially sparsely villosus, especially on veins, adaxially glabrous or sparsely pilose when young, base shallowly to deeply cordate or rounded, margin dentate to obscurely dentate, apex acute or acuminate to long acuminate. Capitula sessile or shortly pedunculate, arranged in spikes or racemes, 3-flowered; involucrle cylindric, 3–4 mm in diam.; phyllaries ca. 6-seriate, papery, abaxially glabrous or apically pubescent, outer phyllaries ovate, 2.5–3 mm, inner nar-
rowly oblong, ca. 1 cm. Florets bisexual, chasmogamous, cor-

rolls tubular, 0.9–1.3 cm, deeply 5-lobed, lobes linear, unequal,

anther appendages rounded. Achenes terete, ca. 8 mm, pilose;

pappus red-brownish, ca. 10 mm. Fl. Mar, Jul–Oct.

Forests along stream banks; 500–2000 m. Taiwan [Japan].

Ainsliaea macroclinidioides is a polymorphic species, with leaf

blades varying from ovate-lanceolate with base rounded, apex long acu-

minate, and margin dentate (in the type specimen from Taiwan) to leaf

blades ovate to deltate with base rounded to deeply cordate, apex acu-

minate, and margin dentate to obscurely dentate (in specimens from the Ryuku Islands, Japan). Specimens from SE China with entire leaf mar-

gins that have been determined as A. macroclinidioides are referred in

the present treatment to A. kawakamii.


紫枝兔儿风  zi zhi tu er feng

Herbs, perennial, 0.8–1.2 m tall. Leaves alternate above

basal part of stem, deciduous in flowering seasons; petiole 5.5–

11 cm, broadly winged; leaf blade ovate or broadly ovate, 7–12
times 5.5–9.5 cm, papery, palmate-pinnate veined, both surfaces

sparsely pilose, sometimes glabrate when old, base shallowly
cordate, margin obscurely denticulate, apex acute to shortly

acuminate. Capitula shortly pedunculate, arranged in spikes, 3-

flowered; involucrle cylindric, 4–5 mm in diam.; phyllaries ca.

5-seriate, papery, abaxially glabrous, outer phyllaries ovate, 3–4

mm, inner narrowly lanceolate, ca. 1.5 cm. Florets bisexual, clei-

stogamous, corollas closed, tubular, minutely 5-lobed, ca.

7 mm, hidden in pappus, anther appendages rounded. Achenes

suberete, ca. 5 mm, densely pilose; pappus dark white, ca. 9

mm. Fl. Sep–Oct.

- Forests, stream banks; 3000–3400 m. Sichuan, Yunnan.


无翅兔儿风  wu chi tu er feng

Ainsliaea aptera f. paniculata Kuntze.

Herbs, perennial, 30–70 cm tall. Leaves approximate above

basal part of stem, basal ones deciduous in flowering seasons;

petiole 7–13(–20) cm, wingless; leaf blade ovate, broadly ovate,

or subrounded, 5–15 × 3.5–12 cm, papery, palmate-pinnate

veined, both surfaces sparsely pilose, sometimes glabrate when

old, base shallowly (rarely deeply) cordate, margin dentate,

**药山兔儿风, yao shan tu er feng**

Herbs, perennial, 30–75 cm tall. Leaves in basal rosette, sessile; leaf blade lanceolate or narrowly elliptic, 9–18 × 1–3.5 cm, subleathery, palmate-pinnate veined, both surfaces densely gray-white villous, base attenuate, margin ciliate, very sparsely callose-denticulate, apex acute. Capitula sessile, 5–9 clustered, arranged in spikes, 2- or 3-flowered; involucre cylindric, ca. 3 mm in diam.; phyllaries ca. 5-seriate, subleathery, outer phyllaries ovate, 3–4 mm, abaxially densely villous, inner narrowly elliptic, 1.4–1.5 cm, glabrous. Florets bisexual, chasmogamous, corollas purplish red, tubular, ca. 1.2 cm, deeply 5-lobed, lobes linear, unequal, anther appendages truncated. Achenes obconical, 4.2 mm, densely white villous; pappus dark yellow or yellow-white, 6–9 mm. Fl. Aug–Nov.

- Forest margins, scrub or grassy areas of mountain slopes; 2000–3500 m. Guizhou, Sichuan, Yunnan.


**心叶兔儿风, xin ye tu er feng**

Herbs, perennial, 30–75 cm tall. Leaves in basal rosette; petiole 1–6 cm, wingless; leaf blade lanceolate, 4.5–7 × 1.4–3 cm, papery, palmate-pinnate veined, abaxially caerulescent or caerulescent-purple, sparsely villous, especially on veins, adaxially green, glabrate when old, base cuneate or slightly acuminate, margin callose-denticulate, apex acute. Capitula subsessile, arranged in spikes, 3-flowered; involucre obconical, 4–5 mm in diam.; phyllaries 5- or 6-seriate, papery, abaxially glabrous, outer phyllaries ovate, ca. 0.5 mm, median ovate-oblong, 1.5–3 mm, inner linear-lanceolate, 1–1.3 cm. Florets bisexual, cleistogamous, corollas closed, tubular, minutely 5-lobed, 0.4–1 cm, anther appendages truncated. Achenes fusiform, ca. 5 mm, glabrous; pappus dark yellow, ca. 8 mm. Fl. Aug–Nov.

- Forests, stream banks; 900–1200 m. Guizhou, Sichuan, Yunnan.


**细穗兔儿风, xi sui tu er feng**

_Aimsliaea latifolia_ (D. Don) Schultz Bipontinus var. _obo vata_ (Franchet) Grierson & Lauener; _A. pteropoda_ Candolle var. _obovata_ Franchet.

Herbs, perennial, 20–60 cm tall. Leaves in basal rosette; petiole short, nearly absent or 3–8 mm, wingless; leaf blade obovate or obovate-rounded, 3–10 × 2–6 cm, papery, palmate-pinnate veined, both surfaces sparsely villous, base rounded, abruptly constricted into petiole, margin callose-denticulate, apex obtuse or rounded. Capitula subsessile or shortly pedunculate, commonly 2 or 3 clustered, arranged in spikes; involucre cylindric, 2–3 mm in diam.; phyllaries ca. 6-seriate, papery, abaxially glabrous or very sparsely pilose, outer phyllaries ovate, 1.5–3 mm, inner narrowly elliptic, ca. 1 cm. Florets bisexual, chasmogamous and cleistogamous (at different seasons or in same plant). Chasmogamous floret corollas tubular, ca. 1.3 cm, deeply 5-lobed, lobes linear, unequal, anther appendages truncate. Achenes oblong, ca. 4 mm, ribbed, densely white pilose; pappus brownish, ca. 8 mm, sometimes absent. Fl. Nov–Jan and Sep–Oct. Cleistogamous floret corollas closed, tubular, minutely 4-lobed, ca. 4 mm, hidden in pappus. Achenes oblong, 4–5 mm, ribbed, densely pilose; pappus brownish, ca. 7 mm. Fl. Jan–Mar, May, Aug–Nov.

- Open forests, forest margins, scrub or grassy areas of mountain slopes; 1100–2000 m. Chongqing, Guangdong, Guangxi, Guizhou, Hubei, Sichuan, Yunnan [Bangladesh, Bhutan, India, Thailand].


**心叶兔儿风, xin ye tu er feng**

Herbs, perennial, 35–85 cm tall. Leaves in basal rosette; petiole broadly winged; leaf blade ovate or broadly ovate to orbicular, papery, palmate-pinnate veined, both surfaces gray-white lanuginous, sometimes glabrate, base cordate, margin callose-denticulate, apex rounded, obtuse, or acute. Capitula subsessile, 4–6 clustered, arranged in spikes, 3(or 4)-flowered; involucre cylindric, ca. 3 mm in diam.; phyllaries 5- or 6-seriate, scarious, abaxially apically striigose, outer phyllaries ovate, 2–2.5 mm, inner linear, ca. 1.2 cm. Florets bisexual, chasmogamous and cleistogamous (at different seasons or in same plant). Chasmogamous floret corollas tubular, 1.1–1.7 cm, deeply 5-lobed, lobes unequal, anther appendages truncate. Achenes subterete, ca. 5 mm, ribbed, densely pilose; pappus brownish, 6.5–8 mm. Fl. Oct–Nov. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, 3.5–5 mm, hidden in pappus. Achenes subfusiform, ca. 6 mm, ribbed, densely pilose; pappus dark yellow or dark brownish, 6–7 mm. Fl. Aug–Oct.

- Dense forests, stream banks; 900–3500 m. Chongqing, Guizhou, Sichuan, Yunnan.

1a. Leaf blade broadly ovate to orbicular ....... 19a. var. _bonatii_ 1b. Leaf blade narrowly ovate ............ 19b. var. _multibracteata_

19a. Ainsliaea _bonatii_ var. _bonatii_

**心叶兔儿风(原变种), xin ye tu er feng (yuan bian zhong)**

_Ainsliaea bonatii_ var. _arachnoidea_ Beauverd; _A. bonatii_ var. _glabra_ Beauverd; _A. pteropoda_ Candolle var. _platyphylla_ Franchet.

Petiole 5–19 cm × 4–18 mm (at upper point); leaf blade broadly ovate to orbicular, 6–11.5 × 5–11.5 cm, apex acute to
subobtuse. Florets usually chasmogamous, occasionally florets cleistogamous at apex of stem.

- Dense forests, stream banks; 900–3000 m. Chongqing, Guizhou, Sichuan, Yunnan.

The lectotype of *Ainsliaea pteropoda var. platyphylla* (Yunnan, J. M. Delavay 607, P!) shows no diagnostic character that differentiates it from *A. bonatii var. bonatii*; the former name is therefore placed into synonymy of the latter.


Petiole 5–13 cm × 6–8 mm (at upper point); leaf blade narrowly ovate, 8.5–11 × 5–6 cm, apex acute; cauline leaves alternate, petiolate to sessile, ovate to ovate-lanceolate. Florets usually cleistogamous.

- Dense forests, stream banks; 3000–3500 m. Sichuan.


Herbs, perennial, 30–60 cm tall. Leaves in basal rosette; petiole 4–9 cm, winged, sparingly pilose; leaf blade ovate or ovate-lanceolate, 3.5–9 × 2.5–4.5 cm, subleathery, palmate-pinnate veined, abaxially densely pilose, adaxially sparsely pilose, base constricted and decurrent into petiole, margin callose-denticulate and adaxial surface strigose, base more rarely discolorous with abaxial surface strigose-lanate and adaxial surface sparsely strigose, base constricted and decurrent into petiole, margin callose-denticulate and straight, apex obtuse or acute. Capitula subsessile or shortly pedunculate, (1 or)2–4 clustered, arranged in spikes or panicles, 3-flowered; involucre cylindric, 3–5 mm in diam.; phyllaries ca. 5-seriate, papery, abaxially ± sparsely pilose, outer phyllaries ovate, ca. 1.5 mm, inner elliptic, ca. 8 mm. Florets bisexual, usually chasmogamous (sometimes without pappus), more rarely cleistogamous (at different seasons or in same plant). Chasmogamous floret corollas tubular, 0.8–1.1 cm, deeply 5-lobed, lobes oblong, unequal, anther appendages rounded. Achenes subfusciform, ca. 5.5 mm, ribbed, densely pilose; pappus absent or present, brownish, 8–10 mm. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 4 mm, hidden in pappus. Achenes subfusciform, ca. 6 mm, ribbed, densely pilose; pappus brownish, 8–10 mm. Fl. year-round.

Valleys with evergreen forests, mossy sites in evergreen forests by streams, open forests, roadsides, very dry open places in full sunlight or some shade; 800–3600 m. Guangdong, Guangxi, Guizhou, Hainan, Hubei, Sichuan, Xizang, Yunnan [Bangladesh, Bhutan, India, Indonesia, Kashmir, Myanmar, Nepal, Thailand, Vietnam].

*Ainsliaea latifolia* most resembles *A. bonatii*, *A. macrocephala*, *A. qianiana*, and *A. spicata*, those species with winged petioles. However, they may be differentiated by their leaf blades, e.g., ovate, concolorous, strigose, and rounded at the base in *A. latifolia var. latifolia*. *Ainsliaea bonatii* has cordate leaf blades, whereas *A. spicata* has obovate or obovate to pandurate blades. *Ainsliaea qianiana* is distinguished by its glabrous and somewhat fleshy leaves. *Ainsliaea macrocephala* may be distinguished by its larger involucre, 13–15 mm, as well as by its foliar trichomes T-shaped.

*Ainsliaea hypoleuca* (A. petelotii) was treated as a separate species by Freire (Ann. Missouri Bot. Gard. 94: 131. 2007) on account of its strongly discolorous leaves, which are densely white tomentose below and deep green and glabrous above.

“*Perdicium triflorum*” (D. Don, Prodr. Fl. Nepal. 169. 1825) belongs here but was not validly published because it was merely cited as a synonym of *Liatris latifolia* (Vienna Code, Art. 34.1(c)).
diagnosis, or reference to such, was provided (Vienna Code, Art. 36.1). It is therefore excluded from the present treatment.


*Herbs, perennial, 10–80 cm tall. Leaves in basal rosette; petiole 2–5 cm, winged in upper half or wingless; leaf blade obovate to oblong or ovate, 2.5–8.5 × 1.5–3 cm, thinly papery, palmate-pinnate veined, abaxially sparsely villous, adaxially subglabrous, base attenuate, rounded, or cuneate, margin slightly repand, callose-denticulate, apex acute to subobtuse.

Capitula subsessile or shortly pedunculate, commonly 2 or 3 clustered, arranged in spikes, (1–)3-flowered; involucre cylindric, ca. 2 mm in diam.; phyllaries ca. 5-seriate, papery, abaxially apically pilose, outer phyllaries ovate, 1.5–2 mm, inner linear, 0.7–1.6 cm. Florets bisexual, chasmogamous and cleistogamous (at different seasons). Chasmogamous floret corollas tubular, ca. 7.5 mm, deeply 5-lobed, lobes oblong, anther appendages rounded. Achenes subellipsoidal or ovate, 1.5–2 mm, ribbed, glabrous, sometimes apically pilose; pappus absent. Fl. Dec–Apr. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 3.2 mm, hidden in pappus. Achenes terete, ca. 6 mm, ribbed, glabrous; pappus white to dark yellow, ca. 8 mm. Fl. Jun–Nov.

- Open forests; 2000–3900 m. Taiwan, Yunnan.


*Herbs, perennial, 10–60 cm tall. Leaves in basal rosette; petiole 3–9 cm, distal part winged, proximal part wingless, rarely nearly wingless; leaf blade ovate or ovate-lanceolate, 2–7 × 2–5 cm, papery, palmate-pinnate veined, both surfaces sparsely villous, base attenuate, margin slightly repand, callose-denticulate, apex acute or obtuse. Capitula subsessile or shortly pedunculate, commonly 2 or 3 clustered, arranged in spikes, (1–)3-flowered; involucre cylindric, 2–3 mm in diam.; phyllaries ca. 5-seriate, papery, abaxially glabrous or apically pilose, outer phyllaries ovate, 1.5–2.5 mm, inner lanceolate, ca. 1.2 cm. Florets bisexual, chasmogamous and cleistogamous (in same plant or at different seasons). Chasmogamous floret corollas tubular, 5.5–9 mm, deeply 5-lobed, anther appendages rounded. Achenes terete, ca. 3 mm, ribbed, densely pilose; pappus absent. Fl. Dec–Apr. Cleistogamous floret corollas closed, tubular, minutely 4-lobed, ca. 4 mm, hidden in pappus. Achenes terete, 3–5 mm, ribbed, densely pilose; pappus brownish, ca. 7 mm. Fl. Dec–Jul.

Open forests, forest margins, scrub; 500–3500 m. Guangdong, Hainan, Taiwan, Xizang, Yunnan [Indonesia, Philippines, Vietnam].

*Ainsliaea tonkinensis* a rheophyte distributed in Vietnam, is sometimes treated as a synonym of *A. reflexa* (see Freire, Ann. Missouri Bot. Gard. 94: 149. 2007). Further studies are necessary to confirm whether or not they are conspecific.


*Herbs, perennial, 40–80 cm tall. Leaves in basal rosette; petiole 4–11 cm, wingless, densely white lanuginous; leaf blade ovate, 9–13 × 6–12 cm, papery, palmate-pinnate veined, abaxially white, densely white lanuginous, adaxially green, sparsely white lanuginous, base cordate, margin obviously dentate, apex obtuse or rounded. Capitula sessile, solitary or 2 or 3 arranged in spikes, 3-flowered; involucre cylindric, 6–7 mm in diam.; phyllaries ca. 5-seriate, papery, abaxially subglabrous, outer phyllaries ovate, 2–3 mm, inner lanceolate, ca. 11 mm. Florets bisexual, chasmogamous, corollas white or pink, tubular, ca. 1.5 cm, deeply 5-lobed, lobes linear, unequal, anther appendages...
rounded. Immature achenes awl-shaped, ca. 2.5 mm, sparsely villous; pappus dark white, 11–12 mm. Fl. Jul–Jan.

- Forests, forest margins, grassy areas of mountain slopes; 2800–3000 m. Sichuan, Yunnan.


秀丽兔儿风 xiu li tu er feng

Herbs, perennial, 0.3–1.2 m tall. Leaves in basal rosette; petiole 10–30 cm, wingless, villous; leaf blade cordate or ovate-cordate, 8–22 × 4.5–14 cm, subleathery, palmate-pinnate veined, base deeply cordate, margin sparsely callose-denticulate, ciliate, apex obtuse. Capitula subsessile or shortly pedunculate, arranged in panicles, 2(or 3)-flowered; involucre cylindric, ca. 3.5 mm; phyllaries ca. 5-seriate, subleathery, abaxially apically pilose, outer phyllaries ovate, 3–3.5 mm, inner oblong, 1–1.2 cm. Florets bisexual, chasmogamous, corollas white, tubular, ca. 1.6 cm, deeply 5-lobed, lobes linear, unequal, anther appendages truncate or slightly emarginate. Achenes terete, ca. 5.5 mm, densely white pilose; pappus yellow-white, 8–9 mm. Fl. Nov.–Mar.

- Limestone forests; 1000–2500 m. Guizhou, Yunnan [Vietnam].

1a. Leaf blade abaxially densely white lanuginous ........................................ 26a. var. elegans
1b. Leaf blade abaxially densely strigose .... 26b. var. strigosa

26a. Ainsliaea elegans var. elegans
秀丽兔儿风(原变种) xiu li tu er feng (yuan bian zhong)

Ainsliaea elegans var. tomentosa Mattfeld; Pertya esquisetula H. Léveillé.

Leaf blade abaxially densely white lanuginous, adaxially strigose when young and glabrate when old. Fl. Nov.–Mar.

- Limestone forests; 1000–1900 m. Guizhou, Yunnan.

26b. Ainsliaea elegans var. strigosa
红毛兔儿风 hong mao tu er feng

Leaf blade strigose on both surfaces. Fl. Jan.–Mar.

- Limestone forests; 1800–2500 m. Yunnan [Vietnam].


狭翅兔儿风 xia chi tu er feng

Ainsliaea apertoides Candolle var. apertoides C. C. Chang, Sinensia 4: 227. 1934.

Herbs, perennial, 20–50 cm tall. Leaves commonly in basal rosette, sometimes tightly alternate near base of stem; petiole 4–11 cm, wingless; leaf blade ovate, 5–10 × 3.5–6 cm, papery, palmate-pinnate veined, abaxially white tomentose, adaxially pubescent, base cordate, margin denticulate, apex acute to acuminate, rarely obtuse. Capitula sessile, arranged in spikes, 3-flowered; involucre cylindric, 3–4 mm in diam.; phyllaries ca. 7-seriate, papery, abaxially glabrous, outer phyllaries ovate or broadly ovate, 0.8–1.2 mm, inner narrowly elliptic, ca. 1.3 cm. Florets bisexual, chasmogamous and cleistogamous (at different seasons). Chasmogamous floret corollas purplish red, tubular, 1.2–1.4 cm, deeply 5-lobed, anther appendages truncate. Achenes fusiform, ca. 6 mm, densely white villous; pappus light red, ca. 7 mm. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 4 mm, hidden in pappus. Achenes 5–6 mm; pappus ca. 7 mm. Fl. Oct.–Feb.

- Forests; 1200–1800 m. Sichuan, SE Yunnan [Bhutan, India].


小兔儿风 xiao tu er feng

Herbs, perennial, 11–18 cm tall. Leaves in basal rosette; petiole 1–2.3 cm, wingless; leaf blade ovate, 0.7–1.6 × 0.5–1 cm, papery, palmate-pinnate veined, abaxially red, sparsely villous, adaxially sparsely strigose, base shallowly cordate, margin sparsely callose-denticulate, apex mucronate. Capitula shortly pedunculate, arranged in panicles, 3-flowered; involucre cylindric, ca. 3 mm in diam.; phyllaries ca. 5-seriate, abaxially glabrous, outer phyllaries ovate, 1–3.5 mm, inner oblong, ca. 7 mm. Florets bisexual, chasmogamous and cleistogamous. Chasmogamous floret corollas tubular, ca. 9 mm, deeply 5-lobed, lobes oblong, unequal, anther appendages rounded. Achenes fusiform, ca. 5 mm, ribbed, glabrous; pappus dark yellow, 6–8 mm. Cleistogamous floret corollas closed, tubular, ca. 1.5 mm, hidden in pappus. Fl. Aug.–Oct.

- Forests; 1200–2400 m. Sichuan.


花莲兔儿风 hua lian tu er feng

Herbs, perennial, ca. 20 cm tall. Leaves basally clustered; petiole 1–1.5 cm, wingless; leaf blade deltate, 1–1.5 × 1.5 cm, palmate-pinnate veined, base cordate, margin obscurely denticulate, apex acute. Capitula sessile, arranged in spikes, 3-flowered; involucre campanulate; outer phyllaries ovate, inner linear to lanceolate. Florets bisexual, chasmogamous, corollas tubular, ca. 10 mm, 5-lobed. Achenes oblong to elliptic, densely pilose; pappus unknown. Fl. Jan.

- About 3000 m. Taiwan.

This species is very similar to Ainsliaea apiculata var. apiculata in its leaves long petiolate, leaf blades deltate, and capitula arranged in spikes. The only difference is that A. paucicapitata has leaf blades shallowly 5-lobed (vs. 5-angled) and leaves basally rosulate (vs. leaves clustered above stem base). No material of this species was available, so the description is based on the original diagnosis and a photograph of the type distributed by TI.


卡氏兔儿风 ka shi tu er feng

Ainsliaea cleistogama C. C. Chang.

Herbs, perennial, 25–80 cm tall. Leaves basally clustered;
petiole (1.5–)3–10 cm, wingless, conspicuously strigose; leaf blade ovate to oblong, 4–13 × (0.5–)3–7 cm, papery, palmate-pinnate veined, abaxially reddish strigose, especially on veins, adaxially sparsely strigose, base deeply cordate, margin obscurely denticate, apex acute to subobtuse; cauline leaves (when present) similar to radical, 17–30 × 9–16 mm, shortly petiolate and cuneate at base. Capitula sessile or shortly pedunculate, arranged in panicles, 3-flowered; involucre cylindric, 3–5 mm in diam.; phyllaries 5- or 6-seriate, purple, papery, strigose apically, outer phyllaries ovate, 2–2.5 mm, inner linear to elliptic, 6–10 mm. Florets bisexual, cleistogamous, corollas white, closed, tubular, minutely 5-lobed, 3–3.5 mm, anther appendages shortly apiculate. Achenes oblong-elliptic, 3–4 mm, densely pilose; pappus brownish white, ca. 7 mm. Fl. Jun–Jul.

This species is very similar to **Ainsliaea cavaleriei**, *A. fragrans*, and *A. ramosa* in its leaf blade ovate to oblong, leaf base deeply cordate, and petioles villous, but it differs by its phyllaries glabrous and leaf blade abaxially whitish green with veins red.

33. **Ainsliaea angustata** C. C. Chang, Sinensia 5: 158. 1934.

**马边兔儿风** ma bian tu er feng

Herbs, perennial, 20–50 cm tall. Leaves in basal rosette; petiole 2–9 cm, wingless; leaf blade narrowly elliptic to lanceolate, 5–9 × 1–2.5 cm, subleathery, palmate-pinnate veined, abaxially strigose, adaxially sparsely strigose, base attenuate, slightly decurrent, margin entire or sparsely callose-denticulate, apex mucronate. Capitula shortly pedunculate, arranged in panicles, 3-flowered; involucre cylindric, ca. 4 mm in diam.; phyllaries 4- or 5-seriate, abaxially glabrous, outer phyllaries ovate, 2–3 mm, inner oblong-lanceolate, 7.5–9 mm. Florets bisexual, chasmogamous, corollas tubular, 0.9–1.2 cm, deeply 5-lobed, lobes oblong, unequal, anther appendages acuminate. Achenes fusiform, ca. 4 mm, densely white pilose; pappus brownish or slightly red, ca. 6.5 mm. Fl. May–Oct.


**屏边兔儿风** ping bian tu er feng

*Ainsliaea gongshanensis* H. Chuang; *A. pingbianensis* var. **malipoensis** H. Chuang.

Herbs, perennial, 30–50 cm tall. Leaves in basal rosette; petiole 4–11 cm, wingless, densely fulvous strigose; leaf blade narrowly oblong or oblong-lanceolate, (7–)8–12 × 3–6 cm, papery, palmate-pinnate veined, both surfaces villous, base rounded, margin callose-denticulate, ciliate, apex obtuse to acute. Capitula shortly pedunculate, arranged in panicles, 3(–5)-flowered; involucre cylindric, 3–4 mm in diam.; phyllaries ca. 5-seriate, abaxially pilose when young and glabrate when old, outer phyllaries ovate, 1–2.5 mm, inner narrowly elliptic, 7–10 mm. Florets bisexual, chasmogamous and cleistogamous (at different seasons). Chasmogamous floret corollas tubular, 7–9 mm, deeply 5-lobed, lobes oblong, unequal, anther appendages acuminate. Achenes fusiform, ca. 2 mm, ribbed, densely pilose; pappus dark yellow, 6–8 mm. Fl. Apr–Jun. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 5 mm, hidden in pappus. Achenes ca. 2.5 mm; pappus ca. 6 mm. Fl. Oct–Dec.

黄毛兔儿风 huang mao tu er feng

*Ainsliaea fulvoides* H. Chuang; *A. fulvoides* var. *gla-briachenia* H. Chuang; *A. lijiangensis* H. Chuang.

Herbs, perennial, 15–45 cm tall. Leaves in basal rosette; petiole 2–7 cm, wingless; leaf blade elliptic or subovate, 3–7.5 × 1.5–4 cm, subleathery, palmate-pinnate veined, both surfaces strigose, base rounded, margin callose-denticulate, apex rounded or obtuse. Synflorescence axis solitary, obscurely bracteate; paracalades in spike. Capitula subseisissile or shortly pedunculate, (1 or) 2 or 3, arranged in spikes; involucre cylindric, ca. 3 mm in diam.; phyllaries ca. 5-seriate, subleathery, abaxially sparsely pilose, outer phyllaries ovate, 2–3 mm, inner oblong or lanceolate, 5–10 mm. Florets bisexual, chasmogamous and cleistogamous (at different seasons). Chasmogamous floret corollas tubular, 8–10 mm, deeply 5-lobed, lobes oblong, unequal, anther appendages rounded. Achenes fusiform, ca. 5 mm; pappus white, dark white, or light red, 5–7 mm. Fl. Apr–Oct. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, 2.8–7 mm, hidden in pappus. Achenes fusiform, ca. 4 mm; pappus yellow-white, 5–7.5 mm. Fl. Apr–Oct.

36. Ainsliaea glabra var. glabra

光叶兔儿风(原变种) guang ye tu er feng (yuán biàn zhòng)

*Ainsliaea lancifolia* Franchet.

Achenes glabrous or apically pilose. Fl. Apr–Oct.


四川兔儿风 si chuan tu er feng

*Ainsliaea sutchuenensis* Franchet, J. Bot. (Morot) 8: 296. 1894; *A. glabra* var. *temunicalis* (Mattfeld) C. C. Chang; *A. plantaginifolia* Mattfeld; *A. temunicalis* Mattfeld.


直脉兔儿风 zhi mai tu er feng

Herbs, perennial, 20–50 cm tall. Leaves mostly in basal rosette; petiole 3–10 cm, wingless; leaf blade ovate or oblong-lanceolate, 5–13 × 1–2.5 cm, leathery, palmate-pinnate veined, both surfaces glabrous or abaxially sparsely strigose, base long attenuate, margin callose-denticulate, not ciliate, apex acute; cauloine leaves few, smaller. Capitula shortly pedunculate, arranged in panicles, 2- or 3-flowered; involucre cylindric, 4–5 mm in diam.; phyllaries 4 or 5-seriate, papery, outer phyllaries ovate, 1–2 mm, abaxially glabrous, inner lanceolate, 8–10 mm, abaxially with long glandular trichomes. Florets bisexual, chasmogamous and cleistogamous (at different or same seasons). Chasmogamous floret corollas tubular, 8–8.5 mm, deeply 5-lobed, lobes oblong, anther appendages rounded. Achenes fusiform or obconical-fusiform, ca. 5 mm, ribbed, densely white pilose; pappus dark white, ca. 6 mm. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, ca. 4.2 mm, hidden in pappus. Achenes fusiform, ca. 2.5 mm; pappus ca. 6 mm. Fl. Apr–Jun.


小叶兔儿风 xiao ye tu er feng

Herbs, perennial, 11–25 cm tall. Leaves basally clustered; petiole 2–5 cm, wingless, strigose; leaf blade ovate to oblong, 2–3.5 × 1.5–2 cm, subleathery, palmate-pinnate veined, abaxially moderately strigose, adaxially subglabrous, base abruptly

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**MUTISIEAE**

The variation patterns of the differential characters mentioned in the protologues of *Ainsliaea fulvipes*, *A. fulvoides*, *A. fulvoides* var. *gla-briachenia*, and *A. lijiangensis*, e.g., achene pubescence and floret type (i.e., both chasmogamous and cleistogamous florets in the same plant or only cleistogamous florets) seem very complex. The present taxonomy is a temporary treatment based on limited specimens, and extensive field investigations at the population levels are needed to clarify their identities.


光叶兔儿风 guang ye tu er feng

Herbs, perennial, 15–80–(150) cm tall. Leaves of variable position, alternate between base and median part of stem, basally clustered, or alternate above base of stem, especially in tiny individuals; petiole 4–18 cm, wingless; leaf blade ovate-lanceolate, lanceolate, oblong-lanceolate, or elliptic, 6–20 × 2–10 cm, subleathery, palmate-pinnate veined, commonly both surfaces glabrous, sometimes adaxially sparsely strigose, base attenuate or cuneate, margin callose-denticulate, apex acuminate. Capitula shortly pedunculate, arranged in panicles, 3-flowered; involucre cylindric, 2–4 mm in diam.; phyllaries (5 or) 6-seriate, papery, abaxially glabrous, rarely apically sparsely pilose, outer phyllaries ovate, 1–2 mm, inner linear, 7–8.5 mm. Florets bisexual, chasmogamous and cleistogamous (at different seasons). Chasmogamous floret corollas tubular, 8–10 mm, deeply 5-lobed, lobes oblong, anther appendages rounded. Achenes fusiform, ca. 5 mm; pappus white, dark white, or light red, 5–7 mm. Fl. Apr–Oct. Cleistogamous floret corollas closed, tubular, minutely 5-lobed, 2.8–7 mm, hidden in pappus. Achenes fusiform, ca. 4 mm; pappus yellow-white, 5–7.5 mm. Fl. Apr–Oct.

1a. Achenes glabrous or apically pilose .............. 36a. var. *glabra*
1b. Achenes densely pilose ..................... 36b. var. *sutchuenensis*
rounded, then cuneately narrowed into petiole, margin denti- 
culate, apex acute-mucronate. Capitula shortly pedunculate, 
arranged in spikes, 3-flowered; involucre 5- or 6-seriate, nar-
rowly campanulate, ca. 4 mm in diam.; phyllaries dull purple, 
subeatherly, glabrous, outer phyllaries ovate, 1–2 mm, inner 
linear to elliptic, ca. 10 mm. Florets bisexual, chasmogamous, 
corollas white, tubular, 8.5–11 mm, anther appendages truncate. 
Achenes oblong to obovoid, ca. 2 mm, apically pilose; pappus 
6.5–8 mm. Fl. Oct.

- Open grassy slopes; 500–1000 m. Guangdong.

This species is similar to *Ainsliaea yunnanensis* in its leaves long 
petiolate, leaf blades ovate with cuneate base, and capitule sessile but is 
quite different in its foliar trichomes straight (vs. T-shaped), involucre 
8–10 mm (vs. 13–15 mm), and achenes apically pilose (vs. pilose).

**39. Ainsliaea yunnanensis** Franchet, J. Bot. (Morot) 2: 70. 1888.

云南兔儿风，yun nan tu er feng

*Ainsliaea latifolia* (D. Don) Schultz Bipontinus f. yun-
nanensis (Franchet) Kitamura; *A. petirolea* Candolle var. leo-
phylla Franchet; *A. scabrida* Dunn.

Herbs, perennial, 20–70 cm tall. Leaves in basal rosette; 
petiole 2–7.5 cm, wingless; leaf blade ovate or ovate-lanceolate, 
2–6 × 1–4 cm, subleathery, palmate-pinnate veined, both sur-
faces strigose, with long T-shaped hairs and few glandular hairs, 
base rounded and cuneately narrowed into petiole, margin cal-
lose-dentilicate, apex acute. Capitula sessbille or shortly pe-
dunculate, commonly 3–6 clustered, arranged in spikes; invo-
lucre cylindric, ca. 6 mm in diam.; phyllaries 5- or 6-seriate, 
subeatherly, abaxially glabrous or very sparsely pilose, outer

Incompletely known species


*Ainsliaea mollis* was treated by Y. C. Tseng (FRPS 79: 34. 1996)
as an accepted species, occurring in Sichuan and Yunnan. It resem-
bles *A. fragrans* in external morphology. No material of this species
was available to the present authors. Its identity is dubious.


帝菊属，zhou ju shu

Gao Tiangang (高天刚); D. J. Nicholas Hind

*Macroclinidium* Maximowicz.

Shrubs, subshrubs, or perennial herbs, rarely scandent shrubs. Leaves alternate, or tufted on brachyblasts; leaf blade linear, 
subulate, lanceolate, oblong, or ovate, entire, dentate, or denticulate. Capitula subsebsile or pedunculate, in glomerulate, corymbose, 
or paniculate synflorescences, or solitary, discooid, homogamous; involucre campanulate or cylindric; phyllaries many, 3-seriate to 
multiseriate, imbricate, unequal, herbaceous or leathery; receptacle flat, alveolate or not, glabrous or villous around, epaleate. Florets 
very few, bisexual, rarely unisexual, tubular, corollas deeply 5-lobed, regularly or slightly irregularly, rarely obviously irregularly, lobed, 
lobes linear, revolute; anther bases long tailed, apex appendaged; styles shallowly divided at apex, style branches very short, abax-
ially with short hairs or papilae, apices obtuse. Achenes terete, obovoid, or obconic, 10-ribbed; pappus setae barbellate, numerous.

\[2n = 24, 26, 28.\]

About 25 species: Afghanistan, China, Japan, Thailand; 17 species (16 endemic) in China.

1a. Leaf blade ovate to broadly ovate, rarely subelliptic on brachyblasts, (2.5–)3–7.5 mm wide, margin serrate, veins 3.

2a. Leaves alternate or tufted; capitule solitary.

3a. Brachyblast leaves on branchlets elliptic; capitula terminal on branchlets ................................................. 1. *P. scandens*
3b. Brachyblast leaves on branchlets ovate; capitula terminal on long shoots ........................................ 2. *P. simozawae*

2b. Leaves alternate; capitula many, rarely few, in glomerulate or corymbose synflorescences.

4a. Capitulum 1-flowered; involucres cylindric, ca. 3 mm in diam. ......................................................... 3. *P. desmocephala*

4b. Capitulum 4–12-flowered; involucres campanulate, 5–12 mm in diam.

5a. Phyllary apices mucronate to acuminate, pungent .............................................................................. 4. *P. pungens*

5b. Phyllary apices rounded to obtuse, never pungent.

6a. Capitula solitary, paired, or in corymbose synflorescences; leaf blade base broadly cuneate, obtuse, or truncate.

7a. Florets all bisexual; involucres narrowly campanulate, 5–6 mm in diam.; achenes glabrous or apices sparsely pubescent, pappus dark white ............................................................... 5. *P. henanensis*

7b. Marginal florets female, central florets bisexual; involucres broadly campanulate, ca. 12 mm in diam.; achenes densely hairy, pappus brownish ........................................................................ 6. *P. corymbosa*

6b. Capitula 3–8 in glomerulate synflorescences; leaf blade base cordate, rarely truncate.

8a. Leaf blade apex mucronate or obtuse; florets 9–12 per capitulum ..................................................... 7. *P. pubescens*

8b. Leaf blade apex acuminate to caudate; florets 4 or 5 per capitulum .................................................. 8. *P. cordifolia*

1b. Leaf blade linear, oblong, linear-lanceolate, or ovate-lanceolate, rarely subelliptic, 1–6(–15) mm wide, margin entire, vein 1, never 3, rarely with weak lateral veins.

9a. Phyllaries multi-seriate, at least 6- or 7-seriate; leaf margin strongly revolute.

10a. Capitula many and small, 10–15 × 7–10 mm, solitary and terminal on branchlets or subtended by tufted leaves; florets 4–6 per capitulum.

11a. Leaves on branchlets homogenous, leaf margin strongly revolute, terete, apex mucronate ......... 9. *P. phylicoides*

11b. Leaves on branchlets heterogeneous, leaf margin strongly or slightly revolute, dimorphic, one form terete, other form oblong or spatulate-oblong, apex obtuse or rounded ......................... 10. *P. berberidoides*

10b. Capitula few and large, 2.5–3 × 1.5–2.5 cm, solitary and terminal on branches; florets 7–11 per capitulum.

12a. Capitula terminal, long pedunculate; phyllaries ca. 6-seriate; leaves subterete ........................................ 11. *P. monocephala*

12b. Capitula terminal or axillary, sessile; phyllaries 16–18-seriate; leaves on branchlets oblong ...... 12. *P. tsoongiana*

9b. Phyllaries 3- or 4-seriate, rarely 5-seriate, few; leaf blade flat.

13a. Capitula 1-flowered.

14a. Leaf blade oblong to linear, 11–40 × 2–5 mm; capitula solitary, terminal on branchlets; phyllaries 3-seriate .......................................................... 13. *P. uniflora*

14b. Leaf blade elliptic or obovate, 2–12 × 1–6 mm; capitula many, in leafy panicles, axillary or terminal; phyllaries 5–7-seriate .............................................................................. 14. *P. bodinieri*

13b. Capitula multiflowered or with only 2 florets in female plants.

15a. Involucres narrow, 2–3 mm in diam. ................................................................................................. 15. *P. discolor*

15b. Involucres wide, 5–8 mm in diam.

16a. Leaves without lateral veins and reticulate veins ........................................................................... 16. *P. angustifolia*

16b. Leaves with obvious lateral veins and reticulate veins ................................................................... 17. *P. sinensis*


长花帚菊 chang hua zhou ju

*Erigeron scandens* Thunberg in Murray, Syst. Veg., ed. 14, 1784; *Leucomeris scandens* (Thunberg) Schultz Bipontinus; *Pertya scandens* f. *schultziana* Franchet; *P. scandens* var. *viridis* Nakai.

Shrubs, 1–1.5 m tall. Leaves on long shoots alternate, petiole short, leaf blade ovate, 2.5–3.5 × 1.5–2.5 cm, papery, 3-veined, both surfaces glabrous, base rounded, margin serrate, apex acute or obtuse; leaves on branchlets tufted, 3 or 4, petiole 2–4 mm, 3-veined, leaf blade elliptic or narrowly elliptic, 4–6.5 × 1.5–2.5 cm or 1.5–3 × 0.7–1 cm, abaxially glabrous, adaxially sparsely hispidulous along midvein, base cuneate, margin serrulate, apex acuminate. Capitula solitary, terminal on branchlets, sessile, ca. 3 cm, many flowered; involucre cylindric, ca. 1.5 × 0.8 cm; phyllaries ca. 7-seriate, margin and apices sparsely pilose, outer phyllaries ovate, 1–1.2 mm, inner narrowly oblong, ca. 1.2 cm. Florets bisexual, corollas tubular, 1.6–1.9 cm, deeply 5-lobed, lobes linear-oblong, unequal. Achenes obconic, ca. 7 mm, densely white hairy, ribbed; pappus white, 0.8–1.1 cm. Fl. Jul–Aug.

Forest margins, open forests. Fujian, Jiangxi [Japan].

台湾帚菊 tai wan zhou ju


Shrubs. Leaves on long shoots alternate, petiole 1–3 mm, leaf blade ovate, 2.5 × 1.5–4.5 cm, papery, 3-veined, both surfaces sparsely villous, base rounded, margin mucronulate-dentate, apex acute or obtuse; leaves on branchlets tufted, 3 or 4, leaf blade ovate, deciduous, both surfaces sparsely villous, apex acute. Capitula solitary, terminal on long shoots, ca. 13-flowered; involucre campanulate, 1.4–1.7 cm; phyllaries ca. 7-seri-
ate, outer phyllaries ovate, inner narrowly oblong, ca. 1.2 cm. Florets bisexual, corolla tubular, ca. 1.3 cm, deeply 5-lobed, lobes linear, revolute. Achenes oblong, ca. 8–9 mm. Florets bisexual, corolla tubular, 1.2–1.4 cm, deeply 5-lobed, lobes linear. Achenes fusiform, ca. 8 mm, hispid, ribbed; pappus brownish, 1–1.2 cm. Fl. Jul–Oct.

- Forests; 900–1100 m. Henan, Sichuan.


疏花帚菊 shu hua zhou ju

Subshrubs, 1–3 m tall. Leaves alternate; petiole 3–4 mm; leaf blade broadly ovate or ovate, 6–8 × 4–6 cm, papery, 3-veined, both surfaces sparsely villous along veins, adaxially sparsely villous along midvein, base broadly cuneate or obtuse, margin sparsely dentilicate on middle and upper part, apex acute to acuminate. Capitula many in corymb, terminal on branches, 10- or 11-flowered; peduncle 1–4 cm; involucre broadly campanulate, 1.2–1.5 × ca. 1.2 cm; phyllaries 8-seriate, abaxially densely pubescent, apices rounded or obtuse, outer phyllaries ovate, 2–3 mm, inner narrowly oblong, ca. 10 mm. Florets bisexual, corollas tubular, 1.2–1.4 cm, deeply 5-lobed, lobes linear. Achenes fusiform, ca. 8 mm, hispid, ribbed; pappus brownish, 1–1.2 cm. Fl. Jul–Oct.

- Dense forests. Guangxi, Hunan.


腺叶帚菊 xian ye zhou ju


Subshrubs, 1–2 m tall. Leaves alternate; petiole 3–5(–10) mm; leaf blade broadly ovate or ovate, 5–8 × 4–7 cm, papery, 3-veined, both surfaces densely pubescent, base broadly cordate, subauriculate, sometimes truncate, margin sparsely dentilicate, apex acute or obtuse. Capitula solitary or 2 or 3 in glomerulate synflorescences, axillary, 9–12-flowered; peduncle 4–11 cm; involucre narrowly campanulate, 1.1–1.3 cm × 6–8 mm; phyllaries 7- or 8-seriate, abaxially densely sericeous, apices obtuse or acute (inner phyllaries), outer phyllaries broadly ovate, 1–3 mm, inner linear-oblong, 9–10 mm. Florets bisexual, corollas tubular, ca. 1.8 cm, deeply 5-lobed, lobes linear, unequal. Achenes subfusiform, 5–6 mm, sericeous, ribbed; pappus light brownish, 1.1–1.4 cm. Fl. Jul–Oct.

- Open forests, grassy areas of stream banks, roadsides; 600–1000 m. Fujian, Guangdong, Jiangxi, Zhejiang.


心叶帚菊 xin ye zhou ju

Subshrubs, 1–1.8 m tall. Leaves alternate; petiole 2–4 mm; leaf blade broadly ovate, 5–7 × 3.5–6 cm, papery, 3-veined, both surfaces sparsely hispidulous when young, glabrate when old, base cordate or shallowly cordate, sometimes subtruncate, margin undulate or sparsely dentilicate, apex acuminate. Capitula 3–8 in glomerulate synflorescences, axillary, 4- or 5-flowered; peduncle 1–2 cm; involucre narrowly campanulate, ca. 1.2 cm × 5–6 mm; phyllaries ca. 8-seriate, abaxially pubescent, apices obtuse, outer phyllaries ovate, 1.8–4 mm, inner linear-oblong, 8–9 mm. Florets bisexual, corollas tubular, 1.5–1.6 cm, deeply 5-lobed, lobes linear, unequal. Achenes subfusiform, ca. 6 mm, densely hispidulous, ribbed; pappus light brownish, 1–1.2 cm. Fl. Sep–Oct.

Shrubs, ca. 1 m tall. Leaves on long shoots alternate, deciduous in flowering seasons, petiole very short, marcescent, leaf blade flat, linear-lanceolate to ovate-oblong, 4–8 × 1–4 mm; leaves on branchlets tufted, 4–6, sessile, leaf blade linear-lanceolate, 3–7 × 1–1.2 mm, abaxially glabrous, adaxially white sericeous, base attenuate, margin entire, strongly revolute, apex mucronate. Capitula solitary, terminal on branches, sessile, ca. 1.5 cm, 4–6-flowered; involucriform cylindric, ca. 1 cm × 5 mm; phyllaries 6- or 7-seriate, abaxially sparsely pubescent, margin villous, outer phyllaries ovate, 2–2.5 mm, inner oblong-lanceolate, ca. 1 cm. Florets bisexual, corolla tubular, ca. 1 cm, deeply 5-lobed, lobes oblong-lanceolate, unequal. Achenes terete, 5–6 mm, densely white villous; pappus dark white, ca. 1 cm. Fl. Jun–Sep.

- Margins of forests or scrub; 800–1500 m. Anhui, Hunan, Jiangxi.


Shrubs, 0.5–1.5 m tall. Leaves on long shoots alternate, petiole base expanded, very short, leaf blade flat, ovate or ovate-lanceolate, 5–8 × 2–5 mm, both surfaces subglabrous, base rounded, margin entire or 2-dentate near middle part, apex attenuate; leaves on branchlets tufted, 4–6, sessile, dimorphic, one form flat, oblong to spatulate-oblong, 4–9 × 1–1.7 mm, abaxially glabrous, adaxially white stellate hairy, base attenuate, margin entire, slightly revolute, apex obtuse or rounded, other form strongly revolute, terete or awl-shaped, 2–5 × 0.7–1.2 mm, abaxially glabrous, adaxially densely sericeous, base attenuate, margin entire, strongly revolute, apex obtuse or mucronate. Capitula solitary, terminal on branches, sessile, 7–10 mm in diam., 5- or 6-flowered; involucriform cylindric, ca. 6 mm in diam.; phyllaries 6- or 7-seriate, margin ciliate, outer phyllaries ovate, 1.5–2 mm, inner 9–12 mm. Florets bisexual, corolla tubular, 1–1.3 cm, deeply 5-lobed, lobes oblong-lanceolate. Achenes terete, ca. 6 mm, densely white villous; pappus dark white, ca. 1.1 cm. Fl. Jun–Sep.

- Dry valleys; 2400–3100 m. Xizang, Yunnan.


Shrubs, 30–80 cm tall. Leaves on long shoots alternate, deciduous in flowering seasons, petiole very short, marcescent, leaf blade not seen; leaves on branchlets tufted, 4–6, rarely 9, sessile, leaf blade linear-lanceolate, 5–6 × 1–2 mm, abaxially sparsely arachnoid lanate or subglabrous, adaxially white sericeous, base obtuse, margin entire, strongly revolute, apex mucronate. Capitula few, solitary, terminal on branches, ca. 2.5 cm, 7–11-flowered; peduncle 0.5–2.5 cm; involucre subcampanulate, ca. 2 × 1.5 cm; phyllaries ca. 6-seriate, outer phyllaries ovate, 3–5 mm, inner lanceolate or oblong-lanceolate, ca. 2 cm. Florets bisexual, corolla tubular, ca. 2 cm, deeply 5-lobed, lobes linear. Achenes terete, ca. 8 mm, densely white villous; pappus white, 1.3–1.5 cm. Fl. Jan–Feb.

- Margins of forests or scrub; 300–700 m. Chongqing (Wushan).


Shrubs, 1–1.5 m tall. Leaves on long shoots alternate, deciduous in flowering seasons, petiole very short, marcescent, leaf blade not seen; leaves on branchlets tufted, 2–5, subsessile, leaf blade oblong, rarely narrowly elliptic, 6–12 × 2–5 mm, abaxially glabrous, adaxially glabrous or sparsely pubescent along midvein, base rounded, margin entire, slightly revolute, apex obtuse or rounded. Capitula very few, solitary, terminal on branches or very rarely axillary on long shoots, sessile, 2.5–3 cm, 8–10-flowered; involucriform campanulate, 2–2.5 × 1.5–1.8 cm; phyllaries 16–18-seriate, abaxially sparsely villous, margin scarious, lacerate, outer phyllaries ovate, ca. 0.5 mm, inner oblong-lanceolate, ca. 1.5 cm. Florets bisexual, corolla tubular, ca. 1.9 cm, deeply 5-lobed, lobes linear, 8–9 mm. Achenes fusiform-terete, 8–9 mm, densely white villous, ribbed; pappus white, ca. 1.2 cm. Fl. Apr–May.

- Mountain slopes; 2400–3200 m. Sichuan, Xizang, Yunnan.


Subshrubs, 0.6–1.5 m tall. Leaves on long shoots alternate, petiole ca. 1 mm, leaf blade oblong or linear-oblong, 11–25 × 2–4 mm, papery, abaxially densely sericeous, adaxially sparsely villous, base attenuate, margin entire, apex mucronate or obtuse; leaves on branchlets tufted, 3–5, leaf blade narrowly oblong to linear-lanceolate, 18–40 × 2–5 mm. Capitula solitary, terminal on branches, ca. 1.3 cm, 1-flowered; peduncle 2–4 mm; involucre narrowly cylindric, 9–10 × 2–3 mm; phyllaries ca. 3-seriate, abaxially densely white lanuginose, outer phyllaries ovate, ca. 3.5 mm, inner narrowly linear, 8–10 mm. Florets bisexual, corolla purplish red, tubular, ca. 10 mm, deeply 5-lobed, lobes linear, revolute. Achenes obvoid, ca. 5 mm, white villous, ribbed; pappus white, ca. 8 mm. Fl. Jun–Aug.

- Scrub on mountain slopes; 1900–2100 m. Gansu.


Shrubs, ca. 1 m tall. Leaves on long shoots alternate, petiole ca. 1 mm, leaf blade oblong or linear-oblong, 11–25 × 2–4 mm, papery, abaxially densely sericeous, adaxially sparsely villous, base attenuate, margin entire, apex mucronate or obtuse; leaves on branchlets tufted, 3–5, leaf blade narrowly oblong to linear-lanceolate, 18–40 × 2–5 mm. Capitula solitary, terminal on branches, ca. 1.3 cm, 1-flowered; peduncle 2–4 mm; involucre narrowly cylindric, 9–10 × 2–3 mm; phyllaries ca. 3-seriate, abaxially densely white lanuginose, outer phyllaries ovate, ca. 3.5 mm, inner narrowly linear, 8–10 mm. Florets bisexual, corolla purplish red, tubular, ca. 10 mm, deeply 5-lobed, lobes linear, revolute. Achenes obvoid, ca. 5 mm, white villous, ribbed; pappus white, ca. 8 mm. Fl. Jun–Aug.

- Scrub on mountain slopes; 1900–2100 m. Gansu.
both surfaces sparsely hispidulous, base attenuate, margin entire, ciliate, apex rounded or mucronate; leaves on branchlets tufted, 3–5, leaf blade subelliptic, 2–4 × 1–3 mm. Capitula many in large leafy panicles, 1-flowered; peduncle (0–)1.5–2 mm; involucre cylindrical, 1.3–1.5 cm × 4–5 mm; phyllaries 5-seriate, abaxially pubescent, outer phyllaries ovate, 2–3 mm, inner narrowly oblong, 1.2–1.4 cm. Flores bisexual, corolla tubular, 1.7–1.9 cm, deeply 5-lobed, lobes linear, revolute. Achenes obovoid, ca. 6 mm, densely white villous, ribbed; pappus white or white-yellow, 1.2–1.5 cm. Fl. Jan–Mar.

- Scrub on mountain summits, coniferous forests; 1900–3100 m. Gansu, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan.


### Pertya discolor

Shrubs, 0.8–2 m tall. Leaves on long shoots alternate, petiole ca. 1 mm, leaf blade linear-lanceolate, 7–30 × 2–4 mm, papery, abaxially densely sericeous, adaxially glabrous or sparsely villous when young, base attenuate, margin entire, apex mucronate; leaves on branchlets tufted, 3 or 4, leaf blade lanceolate or oblong-lanceolate, 10–35 × 2–6 mm. Capitula solitary, terminal on branchlets; peduncle 2–5 mm; female capitula 1–1.1 cm, 2-flowered, male capitula 7–8 mm, 3–5-flowered; involucre cylindrical, 2–3 mm in diam.; phyllaries 3-seriate, abaxially densely white lanuginous, outer phyllaries ovate, 2–3 mm, inner narrowly elliptic, ca. 6 mm. Flores unisexual, corollas purplish red, tubular, ca. 7 mm, deeply 5-lobed. Achenes obovoid-oblong or subterete, ca. 5 mm, villous; pappus white, ca. 8 mm. Fl. Jun–Aug.

- Scrub on mountain summits or slopes, coniferous forests; 1900–3200 m. Gansu, Ningxia, Qinghai, Shanxi, Sichuan.

1a. Leaf blade adaxially glabrous or sparsely villous when young, abaxially densely sericeous ........................................ 15a. var. discolor

1b. Leaf blade glabrous on both surfaces or sparsely villous abaxially when young ........................................ 15b. var. calvescens

15a. *Pertya discolor* var. discolor

### Pertya discolor var. discolor

两色帚菊(原变种) liang se zhou ju (yuan bian zhong)

Leaf blade abaxially densely sericeous, adaxially glabrous or sparsely villous when young. Fl. Jun–Aug.

- Scrub on mountain summits, coniferous forests; 1900–3100 m. Gansu, Ningxia, Qinghai, Shanxi, Sichuan.


### Pertya discolor var. calvescens

### Pertya angustifolia


### 同色帚菊 tong se zhou ju

Leaf blade glabrous on both surfaces or sparsely villous abaxially when young. Fl. Jul.

- Scrub on mountain slopes; ca. 3200 m. Gansu.

16. *Pertya angustifolia*

Shrubs. Leaves on long shoots alternate, subsessile, leaf blade lanceolate or narrowly lanceolate, 2–3.5 × 0.3–0.6 cm, papery, abaxially subglabrous, adaxially sparsely pubescent, base attenuate, margin entire, ciliate, apex acuminate; leaves on branchlets tufted, 3 or 4, subsessile, leaf blade oblong or obovate-oblong. Capitula solitary, terminal on branchlets; peduncle ca. 2 cm × 7–8 mm; involucre broadly campanulate, 5–6 × ca. 5 mm; phyllaries ca. 3-seriate, margin ± arachnoid lanate, outer phyllaries ovate, ca. 3 mm, median obovate-oblong or subelliptic, 6–7 mm, inner obovate-lanceolate, 4.5–6 mm. Flores bisexual, corollas tubular, 7–8.5 mm, deeply 5-lobed, lobes slightly unequal, oblong. Immature achenes obconic, ca. 1 mm, densely hairy; pappus snow white, ca. 6 mm. Fl. Apr.

- Meadows, scrub; ca. 3600 m. Sichuan (Dawu).

17. *Pertya sinensis* Oliver, Hooker’s Icon. Pl. 23: t. 2214. 1892.

### 华帚菊 hua zhou ju

*Mypripnois maximowiczii* C. Winkler.

Shrubs, deciduous, 1–2 m tall. Leaves on long shoots alternate, petiole 2–4 mm, leaf blade oblong-lanceolate to lanceolate, 3–5 × 1.2–1.5 cm, papery, both surfaces sparsely pilose or glabrescent, base attenuate or obtuse, margin entire, apex acuminate or mucronate; leaves on branchlets 4–6, tufted, leaf blade oblanceolate-lanceolate to narrowly elliptic, 4–6 × 1.2–1.5 cm or smaller. Capitula solitary, terminal on branchlets, dioecious; peduncle 2–3 cm; female capitula ca. 10 mm, with 4 or 5 florets, male 6–7 mm, with 9–12 florets; involucre narrowly campanulate or subcylindric, 5–8 mm in diam.; phyllaries 4- or 5-seriate, abaxially glabrous or margin sparsely pubescent, outer phyllaries broadly ovate, ca. 2 mm, median obovate, ca. 5 mm, inner obovate-lanceolate, 8–9 mm. Female floret corollas tubular, ca. 9 mm, deeply 5-lobed, lobes unequal; male floret corollas deeply 5-lobed, limbs expanded. Achenes fusiform, ca. 7 mm, 10-ribbed, densely hairy; pappus yellow-white, 7–10 mm. Fl. Jun–Aug.

- Scrub, coniferous forests; 2100–2500 m. Gansu, Henan, Hubei, Ningxia, Qinghai, Shanxi, Sichuan.
deepest; male florets white, tubular, corolla irregularly deeply 5-lobed; anther bases of male florets tailed, apex appendaged, anthers of male florets reduced; styles of female florets shallowly divided at apex, style branches very short, abaxially with short hairs, apices obtuse; styles of male florets nearly undivided, abaxially papillate. Achenes fusiform, densely long setuliferous; pappus setae of female florets numerous, barbellate to subplumose; carpopodium annular; pappus setae of male florets of very few scabrid bristles.

- One species: China.

1. **Myripnois dioica** Bunge, Enum. Pl. China Bor. 38. 1833.

蚂蚱腿子 ma zha tui zi

Shrubs, deciduous, 0.6–1.6 m tall. Leaves on long shoots alternate, petiole 3–5 mm, leaf blade elliptic or suboblong, 2–6 × 1–2 cm, papery, both surfaces villous when young and glabrescent when old, base rounded or cuneate, margin entire, apex mucronate to acuminate; leaves on branchlets tufted, subsessile, leaf blade broadly lanceolate or ovate-lanceolate. Capitula solitary, terminal on branchlets, subsessile or with peduncle ca. 8 mm, dioecious, hysteranthous, 7–10 mm in diam.; involucre campanulate or subcylindric, 6–8 mm in diam.; phyllaries 2- or 3-seriate, few, subequal, oblong or suboblong, 8–10 mm, abaxially densely sericeous. Female floret corollas purple, ca. 13 mm, irregularly deeply 5-lobed, often with one slit deepest; male floret corollas white, ca. 13 mm, irregularly deeply 5-lobed. Achenes fusiform, ca. 7 mm, densely hairy; pappus setae of female florets numerous, light white, ca. 10 mm; pappus setae of male florets very few, snow white, 7–8 mm. Fl. Apr–May.

- Open places on mountain slopes; 100–600 m. Hebei, Henan, Hubei, Liaoning, Nei Mongol, Shaanxi, Shanxi.
7. Tribe SENECIONEAE

Herbs, annual or perennial, rarely subshrubs, shrubs, or trees. Leaves alternate, sometimes rosulate or opposite, sessile or petiolate, entire to lobed or deeply divided. Capitula arranged in corymbs or racemes, or solitary, heterogamous and radiate or disciform, or homogamous and discoid; plants sometimes dioecious. Phyllaries 1- or 2(rarely pluri)-seriate, free or connate, outer row of bracts (calyculus) smaller, or absent. Receptacle flat or raised, rarely conical, naked or alveolate. Ray florets female, radiate or shortly tubular, styles 2-lobed. Disk florets bisexual or functionally male; corolla tubular, or with limb funnelform or campanulate, 4- or 5-lobed; stamens 4 or 5, anthers basally rounded, acute, or sagittate, sometimes caudate; style bifid, style branches flat with entire or divided stigmatic area inside, sometimes entire or apically truncate, obtuse, or rounded to conical, sometimes appendaged or with tufts of hair penicillate, glabrous or papillate to hisrate, with or without apical sweeping hairs; endothecial cell wall thickenings radial or polarized or transitional, antheropodium straight and uniform or dilated toward base. Achene cylindric or terete-aangular to ellipsoid-oblong or sometimes flattened, ribbed or smooth, glabrous, glandular, or pubescent. Pappus 1- to many seriate, bristles few or numerous or 0, rarely absent from all florets, white or colored, persistent or caducous. Pollen “senecioid” or sometimes “helianthoid.”

About 150–170 genera and ca. 3,500 species: worldwide; 23 genera (four endemic, three introduced), and 464 species (315 endemic, six introduced) in China.

This is a major tribe in the Asteraceae. Nordenstam (in Kadereit & C. Jeffrey, Fam. Gen. Vasc. Pl. 8: 208–241. 2007) recognized 151 genera, and, more recently, Nordenstam et al. estimated the number to around 160 (in V. A. Funk et al., Syst. Evol. Biogeogr. Compositae, 503–525. 2009). Some new genera have recently been added and a few more will be published, so the number will probably increase to ca. 170. Subtribal classification is problematic. Sometimes only two or three subtribes are recognized, viz., Senecioninae, Tussilagininae, and Blennospermatinae Rydberg. The latter is better included in the Tussilagininae, except for Abrotanella Cassini, which should be treated as a monogeneric subtribe, Abrotanellinae (Robinson et al., Ann. Missouri Bot. Gard. 84: 893–906. 1997; Nordenstam et al., loc. cit.). A satisfactory subtribal classification would probably recognize ca. eight subtribes, but it has not yet been produced. The Chinese members of the tribe Senecioneae are here provisionally divided into three subtribes: Tussilagininae (Cassini) Dumortier, Tephroseridinae C. Jeffrey & Y. L. Chen, and Senecioninae (Cassini) Dumortier (Farfugium, Ligularia, and Cremanthodium were treated in Senecioninae in FRPS(77(2): 1–171. 1989) but are here referred to the Tussilagininae). Twenty-three genera with 463 species are recorded in the present treatment. Plants in some genera have economic value, such as Gynura, Ligularia, Parasenecio, Petasites, and Tussilago, which are used medicinally. Several genera are well known in horticulture (Doronicum, Euryops (Cassini) Cassini, Farfugium, Kleina Mill, Ligularia, Parasenecio, Pericallis, Senecio, Sinacalia, Scirodiscus Lessing, etc.).

1a. Antheropodia (filament collars) balusterform, i.e., slightly to distinctly broadened toward base (although sometimes long and narrow) and with at least some basal cells larger than rest ........................................................... 3. Senecioninae (p. 489)
1b. Antheropodia (filament collars) cylindric, i.e., of uniform width throughout (although rarely gradually slightly broadened toward base) with all cells ± uniform in size, larger basal cells absent.
2a. Phyllaries in 2 rows, all similar, herbaceous ...................................................................................................................... 1. Tussilagininae (Doronicum; p. 371)
2b. Phyllaries at least initially in 1 row, although sometimes an outer series (calyculus) of bracts distinct in size and form (usually shorter) also present.
3a. Inner florets functionally male or plants subdioecious; flowering precocious ........................................ 1. Tussilagininae (p. 371)
3b. Inner of all florets bisexual; flowering not precocious.
4a. Leaves basally sheathed ................................................................................................................................................. 1. Tussilagininae (p. 371)
4b. Leaves basally not sheathed.
5a. Capitula discoid.
6a. Phyllaries 18–22 .............................................................................................................................................. 2. Tephroseridinae (Tephroseris rufa and T. turczaninovii; p. 464)
6b. Phyllaries 3–12 ............................................................................................................................................... 1. Tussilagininae (p. 371)
5b. Capitula radiate.
7a. Ray florets white .................................................................................................................................. 3. Senecioninae (Hainanecio; p. 489)
7b. Ray florets yellow, orange, or reddish.
8a. Rhizomes dilatate, tuberiform ................................................................................................... 1. Tussilagininae (Sinacalia; p. 371)
8b. Rhizomes slender or absent ............................................................................................................. 2. Tephroseridinae (p. 464)

1. Subtribe TUSSILAGININAE

款冬亚族 kuan dong ya zu

Liu Shangwu (刘尚武), Chen Yilin (陈艺林 Chen Yi-ling);
Irina D. Illarionova, Bertil Nordenstam, Hiroshige Koyama, Charles Jeffrey

Antheropodia cylindric or obconic, without enlarged marginal basal cells; endothecial tissue cell wall thickenings polarized,
cells short; stigmatic areas usually confluent or contiguous; chromosome number usually 30, sometimes 29, 28, 26, or 25, rarely 20 or 19.

About 60 genera and 900 species: worldwide; 11 genera (three endemic) and 269 species (193 endemic) in China.

1a. Phyllaries in 2 series, all alike, herbaceous ................................................................. 92. Doronicum
1b. Phyllaries in 1 series, herbaceous, cartilaginous, or leathery, if an outer series (calyculus) also present then distinct in size and form from inner series.

2a. Inner florets functionally male; florets precocious.
   3a. Plants monoecious; peduncles 1-headed ................................................................. 101. Tussilago
   3b. Plants subdioecious; capitula with polygamous florets; peduncles several headed ........................................ 102. Petasites
2b. Inner florets bisexual, florets not precocious.
   4a. Leaves basally sheathed; achenes not beaked.
      5a. Leaf margins involute; achenes hairy ........................................................................ 93. Farfugium
      5b. Leaf margins revolute; achenes glabrous.
         6a. Involucres cylindric or obconic ................................................................. 94. Ligularia
         6b. Involucres broadly campanulate or hemispheric .................................................. 95. Cremanthodium
   4b. Leaves basally not sheathed; achenes beaked or not.
      7a. Capitula radiate; rhizomes dilated, tuberiform .................................................. 96. Sinacalia
      7b. Capitula discoid, homogamous, florets bisexual; rhizomes not tuberiform.
         8a. Style branches with papillae divided at apex into 2 brushlike lobes ....................... 97. Dicercoclados
         8b. Style branches with papillae undivided at apex.
            9a. Cotyledons 1; radical leaves umbraculiform, pendulous when young ......................... 100. Syneilesis
            9b. Cotyledons 2; basal leaves not umbraculiform, not pendulous when young.
               10a. Anthers caudate or sagittate; radical leaves withered by anthesis .................. 98. Parasenecio
               10b. Anthers obtuse, not caudate; radical leaves persistent at anthesis .................. 99. Ligulariopsis


Herbs, perennial. Leaves alternate; basal leaves long petiolate; stem leaves sessile and semiamplexicaul. Capitula large, usually solitary or 2–6(–8) laxly corymbose, radiate; involucre hemispheric or broadly campanulate; phyllaries 2(or 3)-seriate, herbaceous, subequal; outer phyllaries lanceolate, oblong-lanceolate, or lanceolate-linear; inner phyllaries linear or linear-lanceolate, laxly pubescent or glandular, apex long acuminate. Receptacle slightly raised, glabrous or hairy, heterogamous, all florets fertile. Ray florets unisexual, female. Disk florets many seriate, bisexual, tubular, yellow; limb cylindric or campanulate, 5-lobed. Anther bases entire or ± auriculate, filamentous cells equal in size, appendages ovate, style 2-lobed, style branches shortly linear, apex rounded or truncate, puberulent. Achenes oblong or oblong-obconic, glabrous or adpressed hairy, ribbed; pappus of many fine bristles, white or reddish, usually absent in ray florets.

About 40 species: temperate N Africa, Asia, and Europe; seven species (four endemic) in China.

The capitula of the genus are large and colorful. Some species are often cultivated as ornamental plants and some used medicinally.

Doronicum is morphologically and chemically anomalous in the Senecioneae, and molecular data place it either outside the tribe or basally in the tribe (Pelser et al., Taxon 56: 1077–1104. 2007; Nordenstam et al. in V. A. Funk et al., Syst. Evol. Biogeogr. Compositae, 503–525. 2009). Thus, it may be treated either as the only genus of tribe Doroniceae Panero (Phytologia 87(1): 1. 2005), or the name Doroniceae may be treated within synonymy of the Senecioneae.

Doronicum bargusinense Sergeyevskaya var. pilosum C. H. An (Fl. Xinjiang. 5: 477. 1999) is of uncertain status and could not be treated here because no material was seen by the present authors.

1a. Ray florets as long as involucre or shorter; capitula 1.5–2(–2.5) cm in diam., few arranged in racemes at apex of stem.
   2a. Peduncle thick, 3–8 cm, apex dilated and obconic, glandular villous; ray lamina oblong or oblong-elliptic, 7–8 × ca. 2 mm; achenes heteromorphic, glabrous and without pappus in ray florets, densely puberulent in disk florets .......................................................... 6. D. conaense
   2b. Peduncle slender, 1–1.5 cm, apex not dilated, densely villous, glandular hairy; ray lamina linear,
      7–10 × 0.2–0.5 mm; achenes similar; achenes in all florets puberulent, pappus present .................. 7. D. stenoglossum

1b. Ray florets distinctly overtopping involucr; capitula 5–7 cm in diam., solitary, rarely 2.
   3a. Ovary and achenes heteromorphic, achenes in ray florets glabrous and without pappus, in disk florets pappus present and adpressed hairy.

Aronicum altaicum (Pallas) Candolle.

Rhizomes procumbent or sometimes ascending, stout, ca. 1 cm in diam. Stem solitary, erect, green or brown, sometimes purple tinged, 20–80 cm tall, simple, basally glabrous, apically densely glandular hairy, more densely so below capitula. Radical leaves usually withered by anthesis; petiole long, 6–19 cm; blade ovate or obovate-oblong, 5–10 × 4–5 cm, base attenuate, apex rounded or obtuse. Stem leaves 5 or 6; uppermost leaves ovate-oblong, 5–6 × 4–4.5 cm, base attenuate into ca. 2 cm broadly winged petiole; other stem leaves sessile, broadly ovate, semiamplexicaul. Median leaves 7–8 × 3–3.5 cm, upper leaves 2.5–3.5 × 0.8–2.5 cm, all glabrous, base broadly cordate, semiamplexicaul, margin undulate-denticulate, or sometimes entire, glandular ciliate, apex obtuse or slightly acute. Capitula solitary, large, 4–6 cm in diam. with ray florets. Involucre hemispheric, 2–3 cm in diam.; phyllaries equal, 1–1.3 cm; outer phyllaries oblong-lanceolate or lanceolate, 1.8–2 mm wide, densely glandular hairy at base; inner phyllaries linear-lanceolate or linear, 0.5–1 mm wide, glabrous or ciliate on margins only, all phyllaries apically long acuminate. Ray florets yellow, (1.6–)2.2–2.5 cm, with 2–2.5 mm tube, glabrous; lamina linear-oblong, 16–22 × 2–2.5 mm, 3-veined, apically 3-denticulate. Disk florets yellow, 5–5.5 mm, with 1.5–2 mm tube and cylindrical campanulate limb, 5-lobed, lobes ca. 1 mm, apically acute; anthers ca. 2 mm, basally obtuse, appendages ovate; style branches short, apically obtuse or truncate. Achenes yellow-brown or dark brown, cylindrical, 2–4 mm, ribbed, glabrous or sparsely puberulent. Pappus present in all florets, white or red-brown at base, 3–4 mm. Fl. Jun–Aug. 2n = 30, 60.

Grasslands on slopes, understoreys of Picea forests; 2300–2500 m. Nei Mongol, Shaanxi, N Xinjiang [Mongolia, Russia (Siberia)].

Rhizomes erect or ascending, slender, clad in persistent brown petiole bases. Stem solitary or rarely with stoloniferous branches, green, erect, 10–20 cm tall, simple, glabrous, or upper part especially below capitula yellow-brown glandular hairy. Radical and stoloniferous leaves long petiolate; petiole 3.5–7.5 cm, slender, not winged; leaf blade obovate-oblong, ca. 2.5 × 1.5–2 cm, base slightly cordate, apex rounded. Lower stem leaves with petiole dilated at base; blade obovate or obovate-spatulate, ± membranous, base narrowed into ca. 2 cm winged petiole, apex rounded or obtuse. Median and upper leaves sessile, ovate or obovate-oblong, 2.5–4 × 1–2.5 cm, both surfaces glabrous or sparsely puberulent, base cordate, semiamplexicaul, margin apically entire or rarely inconspicuously denticulate, ciliate, apex obtuse or rounded. Capitula solitary, terminal, 3–5 cm in diam. Involucre hemispheric or broadly campanulate, 1.5–2 cm in diam.; phyllaries 2-seriate, green, subequal, herbaceous; outer phyllaries narrowly lanceolate, 10–13 × 1.5–1.8 mm; inner phyllaries linear-lanceolate, 1–1.3 mm wide, abaxially laxly or densely white hairy, apex acumenate. Ray florets 1.8–2.3 cm, with ca. 2 mm tube, glabrous; lamina yellow, 16–20 × 1.5–2 mm, 4-veined, apically 3-denticulate. Disk florets yellow, 4.5–5.5 mm, with ca. 2 mm tube and campanulate limb; lobes ovate, ca. 1 mm; anthers obtuse at base; style branches apically truncate. Achenes cylindric, ca. 2 mm, ribbed, glabrous. Pappus present in all florets, yellow-brown, 3–4 mm, scabrid. Fl. Jul–Aug.

- Grassy slopes, forest understories; ca. 3100 m. Gansu.


长圆叶多郎菊 chang yuan ye duo lang ju

Doronicum oblongifolium is similar to D. turkestanicum but differs in having radical leaves elliptic or obovate-oblong, inner phyllaries linear-lanceolate, tubular of ray florets glabrous, and lamina hairy basally.


中亚多郎菊 zhong ya duo lang ju

Doronicum oblongifolium var. leiocarpum Trautvetter.

Rhizomes horizontal or oblique, ca. 1 cm in diam. Stem solitary, erect, striate, green, 25–80 cm tall, simple, with scattered, orbicular, glandular hairs, sometimes subglabrous in lower part. Leaves with both surfaces glabrous or adaxially and marginally sparsely hairy, margin entire or finely and sparsely toothed, base attenuate, apex obtuse or rather acute. Radical leaves withered by anthesis or present, obovate-spatulate or suborbicular, 4–11 × 4–6.5 cm, abruptly or gradually narrowed into a winged petiole 4–10(–15) cm. Stem leaves 4–6, oblong-ovate or oblong, rarely ovate, 3–11 × 1.5–4 cm, sessile or with broadly winged short petiole, semiamplexicaul. Upper leaves smaller, ovate or obovate-lanceolate, rarely linear-lanceolate. Capitula solitary with ray florets 5–6 cm in diam. Involucre hemispheric, (2–)2.5–3 cm in diam.; outer phyllaries lanceolate-linear, 12–17 × (1.5–)1.8–2 cm; inner phyllaries linear, 1–1.5 mm wide; all phyllaries abaxially and marginally sparsely or densely glandular pubescent, apically long acuminate. Ray florets yellowish, 1.8–3 cm, with ca. 2.5 mm tube, outside densely glandular hairy; lamina 1.5–2 cm × 2–2.8 mm, 4- or 5-veined, apically finely (2 or)3-toothed. Disk florets 5.5–7 mm; corolla dark yellow, with 2.5–3 mm tube and campanulate limb, lobes ca. 1 mm; anthers ca. 1.5 mm, basally entire, antheropodium cylindric. Achenes heteromorphic, brown; marginal achenes smooth, 3–4 mm, pappus absent; achenes in disk florets 3–3.5 mm, glabrous or scattered appressed puberulent, pappus of numerous serrate bristles, white, 3–3.5 mm. Fl. Jun–Aug.

Slopes, understories of Picea forests; 1900–2700 m. Nei Mongol, N Xinjiang [Kazakhstan, Mongolia, Russia (Siberia)].


错那多郎菊 chuo na duo lang ju

Rhizomes short, not tuberous, with numerous fibrous roots. Stem solitary, erect, green, striate, 60–90 cm tall, rather stout, 7–8 mm in diam., simple or branched on synflorescences, scattered glandular hairy in upper part, subglabrous in lower part. Radical leaves often withered by anthesis. Median stem leaves sessile, ovate-oblong, 4–7 × 2.5–3 cm, membranous, both surfaces scattered adpressed glandular pubescent, especially on veins, base dilated, cordate, semiamplexicaul, margin rounded finely toothed or subentire, apex obtuse or rather acute. Upper stem leaves ovate or ovate-lanceolate, 2.5–4 × 1.5–2 cm, both surfaces sparsely shortly glandular hairy, base cordate, semiamplexicaul, apex acuminate. Capitula 3 or 4 in axillary racemes, with ray florets 2–2.5 cm in diam.; peduncles 3–8 cm, glandular pubescent, apically obconically dilated. Involucres hemispheric,
10–13 × 15–20 mm; phyllaries 2- or 3-seriate; outer phyllaries narrowly lanceolate, 1.5–2 mm wide, abaxially glandular pubescent in lower half, glabrous or subglabrous in upper part, margin long ciliate; inner phyllaries linear-lanceolate or linear, 0.5–0.8 mm wide, ciliate; all phyllaries long acuminate, equal to disk or rather shorter than disk. Ray florets yellow, 8–10 mm with 2.5–3 mm tube, glabrous; lamina oblong or oblong-elliptic, 7–8 × ca. 2 mm, 4-veined, apically 2- or 3-denticulate. Disk florets numerous; corolla yellow-green, 3.4–4 mm, with ca. 2.5 mm tube and campanulate-funnelform limb, lobes ovate-triangular; anthers linear, 1–1.2 mm, basally obtuse; style branches short, obtuse or truncate. Achenes homogeneous, brown, oblong-oblanceolate, 2.5–3 mm, 10-ribbed; marginal achenes glabrous, without pappus; achenes in disk florets densely white hairy, pappus pallid-yellow, 3–3.5 mm, scabrid. Fl. Jul–Sep.

- Thickets on slopes; 3800–3900 m. Xizang (Cona).


狭舌多郎菊 Da wu feng cao

Doronicum souliei Cavillier; D. yunnanense Franchet ex Diels.

Rhizomes short, slender, not tuberous. Stem solitary, erect, 50–100 cm tall, simple, rarely virgately inflorescence-branched, sparsely or densely white hairy, with intermixed short glandular hairs. Radical leaves withered by anthesis, elliptic or oblong-elliptic, 8–11 × 3–4 cm, base cuneately narrowed into petiole 3–6 cm, apex obtuse or shortly acuminate. Lower leaves oblong or ovate-oblong, 4–10 × 2.5–4 cm, basally narrowed to narrowly winged petiole. Upper leaves sessile, ovate-lanceolate or lanceolate, 3–12 × 1.5–3.5 cm, base cordate, semiamplexical or constricted and lyrate in lower half. All leaves membranous, margin denticulate or subentire, both surfaces pubescent and shortly glandular hairy, especially on veins. Capitula small, 2–2.5 cm in diam., 2–10 arranged in racemes; peduncles 1–1.5 cm, shortly conical, densely glandular pubescent and villous. Involucres hemispheric or broadly campanulate, ca. 1.5 cm; phyllaries 2- or 3-seriate, green, lanceolate or linear-lanceolate, often exceeding disk, 0.3–1.5 mm wide, outside sparsely or densely villous and glandular hairy, subglabrous or glabrous in upper part, apex acuminate. Ray florets pallid yellow, shorter than involucres or equal to them, with 2.5–3 mm tube; lamina linear, 7–10 × 0.2–0.3 mm, 3- or 4-veined, apically 2- or 3-denticulate. Disk florets yellow, ca. 3.5 mm, with 1.5–2 mm tube and narrow campanulate limb; lobes ovate, ca. 0.5 mm; anthers ca. 3 mm, basally obtuse; style branches obtuse or truncate. Achenes homogeneous, brown, subcylindric or slightly curved, 2.5–3 mm, 10-ribbed, puberulent. Pappus present in all florets, white, yellow-white, or reddish, equal to achenes, scabrid. Fl. Jul–Sep.

- Subalpine and alpine grasslands, forest margins, secondary thickets, understories of Picea forests; 2100–3900 m. Gansu, Qinghai, NW and W Sichuan, Xizang, NW Yunnan.

93. FARFUGIUM Lindley, Gard. Chron. 4. 1857.

大吴风草属 Dagu fengcao shu

Liu Shangwu (刘尚武); Irina D. Illarionova

Herbs, perennial, deciduous or sometimes evergreen, with long rhizomes. Stem scapelike, leafless or with few bracteal leaves, base densely long lanate. Leaves all basal in rosette, each leaf involute and appearing fistlike; petiole broadly sheathed at base; leaf blade reniform or orbicular-reniform, abaxially densely hairy, palmately veined. Capitula many in corymb, base with fewer supple-
Herbs, perennial. Rhizome short, without non-flowering rosette leaves. Roots stout or slender, glabrous or hairy. Stem arising from outer axil of rosette leaves, erect, usually solitary, base surrounded with remains of old petiole. Basal leaves (rosette and lower stem leaves) well developed, palmately or pinnately veined; petioles longer, base broadly sheathed. Stem leaves alternate, fewer, similar to basal leaves but smaller, gradually smaller upward; petiole short, base with or without broad sheath. Capitula numerous in corymb, compound corymb, or paniculate racemes, or solitary, base with few or numerous supplementary bracts; peduncle with a leaflike bract. Involucre cylindric, campanulate, or hemispheric; phyllaries in 2 rows, separate, outer phyllaries narrow, inner phyllaries broad, margin membranous, or phyllaries in 1 row, united, apex 2–5-dentate. Receptacle flat, without scales. Outer florets female, radiate or rarely narrowly tubular, or sometimes ray florets absent. Central florets tubular, bisexual; limb 5-lobed. Anthers obtuse at base, apex triangular or ovate, acute; filaments glabrous, apex inflated. Style branches slender, apex obtuse or rounded. Achenes ribbed, glabrous. Pappus with 2 or 3 rows of denticulate hairs or hairs sometimes absent.

About 140 species: Asia, Europe; 123 species (89 endemic) in China.

1a. Capitula in corymb or compound corymbs, very rarely solitary.
2a. Leaves pinnately veined; leaflike bracts linear; pappus as long as tubular corolla.
3b. Stem base with a densely, brown or reddish brown, floccose-lanate circle; stem leaves without broad sheaths.
4b. Ray florets present; involucre campanulate; pappus white or reddish brown.
5a. Leaves glabrous or hairy on both surfaces; stem slender, 4–7 mm in diam. at base.
6a. Leaves ovate-oblong, base cuneate, margin irregularly coarsely dentate; involucre outside glabrous; outer florets narrowly tubular, female
7b. Plants densely yellow pilose; phyllaries lanceolate, margin narrowly brown membranous, apex acute
8b. Leaves white arachnoid-puberulent on both surfaces; stem robust, 1–2.5 cm in diam. at base.
11a. Ray floret longer than tubular florets, lamina apically entire; leaf base shallowly cordate
11b. Ray floret as long as tubular florets, lamina apically 2–4-parted; leaf base cuneate
3b. Stem base with a densely, brown or reddish brown, floccose-lanate circle; stem leaves without broad sheaths.
12a. Capitula small, in paniculate compound corymbs; involucre narrowly campanulate, cylindrical, or turbinate, 5–11 × 3–10 mm.
13a. Leaves ovate-oblong, base subrounded, with prominent reticulate veins on both surfaces
13b. Leaves sagittate or triangular-cordate, base deeply cordate, without prominent reticulate veins on both surfaces.
14a. Involucre cylindric or narrowly campanulate, 4–7 mm in diam., longer than wide; ray florets 1–4.
2b. Leaves palmately veined, with 3–9 main veins; leaflike bracts ovate to linear; pappus as long as tubular corolla or of tube of corolla.

22a. Capitula including ray florets 3–12 cm in diam.; involucre hemispherical or broadly campanulate, (7–)10–30 mm in diam.; ray florets numerous.

22b. Capitula 2–4; involucre longer than broad; phyllaries outside glabrous or white pilose, brown pilose, apex broadly triangular, obtuse; pappus slightly longer than tube of tubular corolla ........................................ 10. L. retusa

23a. Basal leaves reniform or ovate-reniform, base cordate or rounded, margin dentate or palmatisect; supplementary bracts 2–4 or absent; pappus white or brown.

23b. Basal leaves orbicular-cordate to oblange-ovate, base cordate.

23c. Basal leaves ovate, base cordate or rounded, margin regularly sharply dentate; supplementary bracts

34a. Capitula with 10–15 florets; involucre 4–6 mm in diam., phyllaries 7–10; ray florets 3–5; lamina 2- or 3-parted or entire .................................................. 12. L. oligonema

34b. Capitula with 5–7 florets; involucre 2–3 mm in diam., phyllaries 5; ray florets 1 or 2; lamina 2- or 3-parted or entire .................................................. 12. L. oligonema

35a. Capitula including ray florets 3–12 cm in diam.; involucre hemispherical or broadly campanulate.

35b. Capitula 1 to many; involucre longer than broad; phyllaries outside glabrous or white pilose, brown pilose, apex broadly triangular, obtuse; pappus slightly longer than tube of tubular corolla ........................................ 5. L. hodgsonii

36a. Basal leaves ovate, base cordate or rounded, margin regularly sharply dentate; supplementary bracts

36b. Basal leaves reniform or ovate-reniform, base cordate or rounded, margin dentate or palmatisect; supplementary bracts 2–4 or absent; pappus white or brown.

36c. Basal leaves orbicular-cordate to oblange-ovate, base cordate.

37a. Leaves sagittate .................................................................................................................................... 33. L. songarica

37b. Leaves triangular-cordate ...................................................................................................................... 34. L. thomsonii

14b. Involucre hemispherical or cupular, 8–20 mm in diam., wider than long; ray florets 5–15.

15a. Leaves sagittate .................................................................................................................................... 33. L. songarica

15b. Leaves triangular-cordate ...................................................................................................................... 34. L. thomsonii

16a. Leaves cordate; capitula 1–15, in corymb; involucre hemispherical or cupular, 11–20 mm in diam. ................................................................. 41. L. narynensis

16b. Leaves sagittate or ovate-trianglar; capitula numerous, in paniculate compound corymb; involucre cupular, 6–14 mm in diam. .................................................. 40. L. thyrsoidae

17a. Leaves elliptic, base oblique, both laterally unequal ........................................................................ 42. L. kunlunshanica

17b. Plants often hairy; capitula solitary, rarely in basipetal raceme.

20a. Stem white hairy; involucre broadly campanulate ............................................................................ 35. L. schischkinii

20b. Stem glabrous; involucre semispherical.

21a. Throat of ray floret outside with 6 flat hairs; petioles of stem leaves basally enlarged into lamellate auricle ................................................................. 36. L. hamiaca

21b. Throat of ray floret outside without hairs; petioles of stem leaves basally not enlarged .......... 37. L. tulupanica

22a. Capitula including ray florets 3–12 cm in diam.; involucre hemispherical or broadly campanulate,

22b. Capitula small, including ray florets less than 2 cm in diam.; involucre narrowly campanulate or cylindric, 2–7 mm in diam., if involucre broader then capitula without ray florets.

23a. Basal leaves ovate, base cordate or rounded, margin regularly sharply dentate; supplementary bracts

23b. Basal leaves reniform or ovate-reniform, base cordate or rounded, margin dentate or palmatisect; supplementary bracts 2–4 or absent; pappus white or brown.

24a. Phyllaries closely imbricate, not spreading, inner ones convex, 2-carinate on outside; pappus reddish brown.

24b. Phyllaries laxly imbricate, spreading, inner ones not convex, not carinate on outside; pappus yellowish white or purplish brown.

25a. Involucre hemispherical, broader than long, 15–25 × 18–30 mm; ray lamina 4–6.5 cm.

25b. Involucre as long as broad or broader than long; phyllaries outside glabrous or white pilose, brown pilose, apex broadly triangular, obtuse; pappus slightly longer than tube of tubular corolla ........................................ 5. L. calthifolia

26a. Leaf margin dentate; pappus as long as tubular corolla ................................................................. 2. L. dentata

26b. Leaves palmatisect; pappus as long as tube of tubular corolla ...................................................... 3. L. japonica

27a. Capitula 1 to many; involucre longer than broad; phyllaries outside glabrous or white pilose, apex broadly triangular, obtuse; pappus slightly longer than tube of tubular corolla ........................................ 4. L. hodgsonii

27b. Capitula 2–4; involucre as long as broad or broader than long; phyllaries outside shortly brown pilose, apex acute; pappus slightly longer than tube of tubular corolla ........................................ 5. L. hodgsonii

28a. Pappus purplish brown, as long as or shorter than tube of tubular corolla ................................. 6. L. phaenicocoea

28b. Pappus yellowish white, as long as tubular corolla.

29a. Involucre 10–12 mm in diam., outside glabrous; stem distally white pilose .............................. 7. L. kentingensis

29b. Involucre 10–20 mm in diam., outside hairy; stem distally yellow or black pilose.

30a. Stem distally and involucre outside black pilose ................................................................. 10. L. retusa

30b. Stem distally yellowish white or grey; involucre outside white pilose or glabrous.

31a. Ray lamina oblong, 10–15 × 2–4 mm ................................................................................ 8. L. cremanshdoioides

31b. Ray lamina cuneate or obovate, 7–8 × 3–6 mm .................................................................... 9. L. cuneata

32a. Capitula with ray florets; lamina slightly extending from involucre, rarely longer and split.

33a. Ray lamina 10–15 mm, 2–5-parted to -divided, rarely entire.

33b. Ray lamina 4–7 mm, entire, apex 2- or 3-denticulate or ray floret similar to tubular floret.

35a. Capitula with 2–5 florets; involucre 2–3 mm in diam., outside glabrous; ray floret usually 1 or absent, similar to tubular floret, but split only on one side and as long as tubular floret ........ 13. L. franchetiana

35b. Capitula with 5–10 florets; involucre 4–7 mm in diam., outside glabrous or pilose; ray florets 1–6.
36a. Phyllaries linear-lanceolate, apex acuminate, curved; ray floret 1, as long as tubular florets, lamina small and narrow; limbs of tubular florets wholly extending from involucre; pappus brown, as long as tube of tubular corolla .......................................................... 14. _L. curvisquama_

36b. Phyllaries all or only inner ones oblong, apex obtuse or acute, erect; ray florets 1–6, lamina wider; tubular florets slightly longer than involucre; pappus brown or white, as long as or longer than tube of tubular corolla.

37a. Involucre narrowly cylindric, 3–4 mm in diam., outside shortly pilose; ray floret 1, lamina obovate-oblong or oblong, ca. 3 mm wide .......................................................... 15. _L. rockiana_

37b. Involucre narrowly campanulate, ca. 6 mm in diam., outside glabrous; ray florets 3–6, lamina narrowly oblong, 1.5–2 mm wide .......................................................... 16. _L. transversifolia_

32b. Capitula without ray florets.

38b. Involucre narrowly cylindric, 1.5–7 mm in diam.

38a. Involucre narrowly or broadly campanulate, or turbinate, 5–20 mm in diam.

39a. Leaves palmatisect, lobes narrow .............................................................. 17. _L. paradoxa_

39b. Leaves undivided, margin dentate.

40a. Capitula numerous in compound corymbs; involucre turbinate, outside yellowish brown shortly pilose, inner phyllaries marginally broadly brown membranous; pappus brown or white, as long as tube of tubular corolla; stem robust, taller, 1–2 cm in diam. at base ........................................ 18. _L. purdomii_

40b. Capitula fewer, in corymb; involucre outside glabrous, inner phyllaries marginally narrowly membranous; pappus white, as long as tubular corolla; stem slender, dwarf, ca. 7 mm in diam. at base.

41a. Capitula fewer than 14; involucre 5–10 mm in diam., phyllaries 5–10.


42a. Leaves glabrous, abaxially pale green, adaxially green, margin coarsely sharply dentate; involucre narrowly campanulate, phyllaries 5–8; florets 6–20 ............................................................ 19. _L. yunnanensis_

42b. Leaves often purplish red, abaxially with short hairs on white reticulate veins, margin undulate; involucre turbinate, phyllaries 9 or 10; florets 20–30 .................................................. 20. _L. potaninii_

43a. Phyllaries 5–10, margin undulate-dentate; phyllaries pupleish red, petaloid, apex acute .............................. 21. _L. cymosa_

43b. Phyllaries 5–7, oblong, apex acute or mucronate, or acute .................................................. 22. _L. microcephala_

44a. Peduncles shortly purplish brown pilose; pappus brown, as long as tubular corolla.

44b. Peduncles shortly yellow pilose or glabrous; pappus white.

45a. Petals 5 or 6(–8), yellow; phyllaries 5; leaves ovate-cordate or subreniform, 5–6(–11) cm wide .......................................................... 24. _L. tenuicaulis_

46a. Florets 4 or 5, purple; phyllaries 4 or 5, outside purple shortly pilose ..................................................... 23. _L. dux_

46b. Florets 3, yellow; phyllaries 3, glabrous .............................................................. 25. _L. tongkyukensis_

47a. Phyllaries 5–10, narrowly lanceolate, apex acuminate.

48a. Leaf margin regularly triangular-denticulate; florets more than 20; pappus as long as tubular corolla .............................................................. 26. _L. xanthotricha_

48b. Leaf margin irregularly coarsely dentate, teeth to 2 cm wide; florets 6–16; pappus as long as or shorter than tubular corolla.

49a. Phyllaries outside densely shorty yellow pilose; pappus as long as tube of tubular corolla .............................................................. 27. _L. achyrotricha_

49b. Phyllaries outside glabrous, purple ciliate; pappus slightly shorter than tubular corolla ....... 28. _L. macrodonta_

47b. Phyllaries 5–7, oblone, apex acute or obtuse.

50a. Involucre outside densely yellow shortly pilose .............................................................. 31. _L. konkalingensis_

50b. Involucre outside glabrous.

51a. Limb of tubular corolla extending from involucre; pappus as long as or shorter than tube of tubular corolla .............................................................. 29. _L. duciformis_

51b. Limb of tubular corolla slightly extending from involucre; pappus longer than tube of tubular corolla .............................................................. 30. _L. nelumbifolia_

1b. Capitula in panicule-racemes, racemes, or solitary, if in corymb then plant blue-gray; pappus absent.

52a. Basal leaves erect, blue-green or grayish green, often glabrous, usually mealy, leaves pinnately veined.

53a. Phyllaries united.

54a. Capitula numerous in race; pappus reddish brown, as long as tube of tubular corolla .......................... 52. _L. schmidtii_

54b. Capitula 1–9, solitary or in corymb; pappus absent ..................................................... 53. _L. biceps_

53b. Phyllaries separate.

55a. Pappus reddish brown, as long as or shorter than tube of tubular corolla .............................................................. 54. _L. mongolica_

55b. Pappus white, rarely rufous, as long as tubular corolla.
56a. Racemes paniculate, with dense and numerous branches in lower part of synflorescence, branches longer, each bearing a raceme.

57a. Capitula small; involucre narrowly cylindrical or turbinate, 3.5–5 × 2–3 mm, phyllaries 4 or 5; ray florets 1–3; tubular florets 2–7 .................................................. 55. L. macrophylla

57b. Capitula larger; involucre cylindrical or campanulate, 6–8 × 5–8 mm, phyllaries 6–8, apex acute or acuminate; ray florets (4 or)5–7; tubular florets 10–14(–16) .................................................. 56. L. heterophylla

56b. Raceme with fewer capitula, rarely branched.

58a. Leaves with conspicuous, white reticulate veins when dry; stem leaves broadly ovate to oblong, ca. 2 × as long as internodes, ascending, base broadened, auriculate or semiamplexicaul.

59a. Capitula without ray florets; leaflike bracts ovate-oblong to lanceolate, membranous, reddish yellow when dry, with conspicuous reticulate veins; involucre broadly campanulate, ca. 10 mm in diam. .................................................. 57. L. lingiana

59b. Capitula with ray florets; leaflike bracts linear; involucre campanulate or turbinate, 4–6 mm in diam.

60a. Leaves herbaceous; petiole of basal leaves broadly winged; phyllaries blackish gray, apex acute or acuminate ................................................................. 58. L. melanocephala

60b. Leaves leathery; petiole of basal leaves without wings; phyllaries dark green, apex triangular.

61a. Stem solid; leaf base cordate; phyllaries outside and margin glabrous or brown ciliate ........ 59. L. dictyoneura

61b. Stem hollow; leaf base cuneate; phyllaries outside shortly pilose, margin densely white ciliate ........................................................................................................ 60. L. brassicoides

58b. Leaves with obscure reticulate veins; stem leaves oblanceolate, shorter than internodes, erect, base narrowed, semiamplexicaul or not.

62a. Leaves usually linear-oblong or elliptic; capitula inclined to one side of raceme rachis .......... 65. L. pleurocaulis

62b. Leaves ovate or elliptic.

63a. Capitula without ray florets ..................................................................................................... 64. L. chalybea

63b. Capitula with ray florets.

64a. Pappus rufous ......................................................................................................................... 63. L. longifolia

64b. Pappus white.

65a. Stem white hairy.

66a. Phyllaries outside white puberulent or glabrous, margin densely white ciliate .............. 68. L. liatroides

66b. Phyllaries outside glabrous, margin glabrous or sparsely white ciliate ............................. 69. L. eriocaulis

65b. Stem glabrous.

67a. Phyllaries blackish gray ........................................................................................................ 67. L. virgaurea

67b. Phyllaries green.

68a. Leaf margin entire; phyllaries outside glabrous ................................................................. 61. L. altaica

68b. Leaf margin dentate; phyllaries outside glabrous or shortly pilose.

69a. Phyllaries outside shortly pilose ............................................................................................ 62. L. alpigena

69b. Phyllaries outside glabrous .................................................................................................... 66. L. tangutorum

52b. Basal leaves spreading or ascending, hairy or at least ciliate on margins, abaxially pale green, adaxially green, leaves pinnately or palmately veined.

70a. Stem scape-like, leafless, base with a circle densely long white lanate; leaves pinnately veined.

71a. Scape stout, base ca. 1 cm in diam.; involucre narrowly campanulate, 6–8 × ca. 5 mm, outside white puberulent; ray lamina ca. 8 mm ................................................................. 70. L. melanothyrsa

71b. Scape slender, 4–5 mm in diam.; involucre campanulate, 10–12 × 8–10 mm, outside sparsely puberulent; ray lamina 10–18 mm ................................................................. 71. L. vellerea

70b. Stem with normal leaves, base not densely lanate; leaves pinnately or palmately veined.

72a. Leaves pinnately veined; stem leaves without broad sheaths; pappus as long as tubular corolla, rarely shorter than tubular corolla.

73a. Capitulum solitary; leaves hastate ........................................................................................ 72. L. jamesii

73b. Capitula numerous in paniculate racemes or raceme; leaves of other forms.

74a. Synflorescence paniculate-racemose or racemose.

75a. Leaves oblong or ovate-oblong, base truncate; synflorescence to 80 cm; ray lamina 5–9 × to 2 mm; limb as long as tube of tubular corolla .................................................. 73. L. fangiana

75b. Leaves triangular or ovate-triangular, base subtruncate or cordate; synflorescence to 50 cm; ray lamina 13–18 × ca. 6.5 mm; limb 3–4 × as long as tube of tubular corolla ................................................................. 74. L. jaluensis

74b. Synflorescence racemose, lower sometimes branched.

76a. Leaves broadly ovate-cordate, abaxially shortly pilose; peduncles usually 2–4, crowded; ray lamina linear, 9–15 × 1–1.5 mm .................................................................................... 75. L. temuipes
76b. Leaves ovate, ovate-cordate, triangular, or sagittate; peduncle solitary; ray lamina usually wider, if lamina linear then more than 3 cm.
77a. Stem and abaxial surface of leaves densely puberulent; stem leaves numerous, apex caudate-acuminate.
78a. Leaves ovate-cordate, abaxially shorty brown pilose; involucre campanulate, phyllaries 5, outside shorty pilose; outer florets female, 1 or 2, without corolla; tubular florets 5; pappus shorter than tubular corolla ................................................................. 76. L. petiolaris
78b. Leaves ovate or triangular, abaxially gray-white puberulent; involucre shallowly campanulate, phyllaries 8 or 9, outside grayish white puberulent; tubular florets numerous; pappus as long as tubular corolla.
79a. Capitula with ray florets; lamina yellow, to 13 mm .................................................. 77. L. lankongensis
79b. Capitula without ray florets; outer florets 1–3(or 4), narrowly tubular, labiate, not colored, shorter than tubular florets ................................................................. 78. L. nyingchensis
77b. Stem and leaves without dense hairs; stem leaves apex obtuse or acute.
80a. Basal leaves sagittate or ovate-cordate; stem leaves all or at least lower ones with long winged petiole.
81a. Pappus rufous, as long as or slightly longer than tube of tubular corolla; petiole broadly winged.
82a. Plants usually shortly yellowish pilose; wings of petiole dentate; involucre broadly campanulate, phyllaries 8, outside shorty pilose; pappus ca. 4 mm ................................. 79. L. pterodonta
82b. Plants glabrous; wings of petiole entire or dentate; involucre narrowly campanulate or cylindric, phyllaries 5–8, outside glabrous or white ciliate; pappus 6–7 mm ....................... 80. L. latipes
81b. Pappus white, as long as tubular corolla; petiole narrowly winged.
83a. Leaves ovate-cordate; involucre broadly campanulate, ca. 10 mm in diam.; ray lamina linear, to 30 mm ................................................................. 81. L. alatipes
83b. Leaves sagittate or ovate-cordate; involucre campanulate, 4–8 mm in diam.; ray lamina oblong, 2–12 mm.
84a. Leaflike bracts ovate, membranous; ray lamina 2–3 mm ................................. 82. L. botryodes
84b. Leaflike bracts narrowly lanceolate or ovate-lanceolate to linear, herbaceous; ray lamina 5–12 mm ................................................................. 83. L. sagitta
80b. Basal leaves ovate, base shallowly cordate, truncate, or cuneate; stem leaves sessile, erect or ascending.
85a. Basal leaves broadly sheathed; mouth of sheath recurved; stem leaves numerous and narrow, ovate-lanceolate or lanceolate, erect, adnate, base narrowed, not amplexicaul.
86a. Leaves ovate-cordate; involucre broadly turbinate, to 15 mm in diam.; pappus reddish brown or initially yellowish white; leaflike bracts linear or filiform .............................. 84. L. platyglossa
86b. Leaves ovate-oblong, triangular, or cordate; involucre 5–10 mm in diam.; pappus yellowish; leaflike bracts linear-lanceolate to rhombic.
87a. Involucre campanulate, longer than wide; phyllaries oblong, apex acute or obtuse, erect ...................................................... 85. L. kanaitzensis
87b. Involucre cupular, broader than long; phyllaries broadly obovate or elliptic, apex broadly triangular and recurved macrorate ............................................. 86. L. lidjiangensis
85b. Basal leaves narrowly sheathed; stem leaves fewer and wider, oblong or ovate, base rounded or subtruncated, semiamplexicaul.
88a. Plants taller, more robust; stem to 2.8 cm in diam. at base; leaves ovate-oblong or broadly ovate, with stout midvein; capitula larger; involucre hemispheric or campanulate, to 2.5 cm in diam. .................................................. 87. L. ghatsukupa
88b. Plants of medium height; stem 3–8 mm in diam. at base; capitula smaller; involucre campanulate, 4–7 mm in diam.
89a. Raceme longer; capitula numerous; phyllaries green, outside glabrous, apex dark brown ................................................................. 88. L. tsangchanensis
89b. Raceme shorter; capitula 4–13; involucre blackish purple or green, outside shorty pilose ..................................................................... 89. L. muliensis
72b. Leaves palmately veined, with 3–9 principal veins; stem leaves broadly sheathing; pappus as long as or shorter than tubular corolla.
90a. Pappus as long as tubular corolla.
91a. Leaflike bracts ovate or ovate-lanceolate, margin denticulate.
92a. Leaflike bracts herbaceous, green; raceme not spreading; peduncles short; involucre campanulate, base rounded; leaves glabrous .................................................................................. 90. L. sibirica
92b. Leaflike bracts membranous, purplish red; raceme spreading; peduncles long; involucre cupular, base truncate; leaves abaxially shortly pilose ................................................................. 91. L. cyathiceps
91b. Leaflike bracts linear, margin entire.

93a. Capitula in paniculate racemes, without ray florets; limb ca. 2 × as long as tube of tubular corolla.
94a. Leaves ca. 5 cm wide, glabrous; involucre campanulate or cupular, outside glabrous, nitid; pappus brown ................................................................. 92. L. leveillei
94b. Leaves more than 5–11 cm wide, adaxially densely shortly yellow pilose; involucre narrowly campanulate, outside densely shortly yellow pappus; pappus yellow ........................................ 93. L. nanchuanica
93b. Capitula in raceme or solitary, with or without ray florets; limb as long as tube of tubular corolla.
95a. Involucre campanulate to broadly campanulate; pappus reddish brown.
95b. Involucre campanulate or turbinate; pappus white or pale yellow.

96a. Leaves reniform or cordate, base cordate, margin coarsely triangular-dentate; ray lamina linear, 1.5–2 mm wide ......................................................... 94. L. hookeri
96b. Leaves triangular, base truncate, margin denticulate; ray lamina oblong, to 5 mm wide .......... 95. L. parvifolia

97a. Stem slender, 2–4 mm in diam. at base; leaves triangular-sagittate or ovate-cordate, 2.2–15 cm wide.
97b. Stem robust, 6–10 mm in diam. at base; leaves reniform or cordate, to 24 cm wide.

98a. Capitula without ray florets; involucre campanulate-turbinate ........................................... 97. L. subspicata
98b. Capitula with ray florets; involucre campanulate .............................................................. 96. L. phyllocolea

99a. Leaves abaxially glabrous, adaxially densely shortly pilose; involucre campanulate to broadly turbinate; ray lamina short and wide, 3–4 mm wide ... 98. L. wilsoniana
99b. Leaves abaxially pilose, adaxially glabrous; involucre campanulate; ray lamina longer and narrower, 1–2 mm wide.

100a. Leaves abaxially pale green, shortly pilose only on veins, adaxially dark green; pappus white ............................................................................ 99. L. atkinsonii
100b. Leaves abaxially densely shortly white pilose; pappus yellowish brown ..................... 100. L. pubifolia

90b. Pappus shorter than tube of tubular corolla.

101a. Leaflike bracts broadly ovate, ovate-lanceolate, or spatulate, margin usually denticulate, if bracts linear-lanceolate then involucre broadly campanulate, ca. 10 mm in diam.

102a. Leaves variable, base sagittate or hastate; basal lobes divergent; sheaths of stem leaves marginally denticulate or laciniate.

103a. Stem robust, 4–12 mm in diam. at base; stem leaves dense and numerous, gradually smaller upward; raceme 22–65 cm; capitula numerous; involucre narrowly campanulate.
104a. Leaves ovate-cordate, glabrous; ray florets 4–6 ...................................................... 101. L. phyllocolea
104b. Leaves triangular-hastate or hastate, brown pilose on both surfaces; ray florets 2 or 3 ................................................................. 102. L. changiana

105a. Involucre broadly campanulate, 8–12 mm in diam.; leaves broadly hastate, 2–3 × wider than long; ray lamina to 4 cm .................................. 103. L. latihastata
105b. Involucre campanulate or narrowly campanulate, 5–7 mm in diam.; leaves cordate or horseshoe-shaped; ray lamina to 2 cm.

106a. Stem and leaves glabrous; leaves triangular- to ovate-cordate; ray lamina obovate-lanceolate .................................................. 104. L. caloxantha
106b. Stem and leaves yellowish red pilose; leaves horseshoe-shaped; ray lamina linear-oblong ........................................................................ 105. L. odontomanes

102b. Leaves reniform or triangular-reniform, base cordate; basal lobes suborbicular, not divergent; sheaths of stem leaves marginally entire.

107a. Capitula without ray florets.
107b. Capitula with ray florets.
109a. Leaflike bracts submembranous ........................................................................ 110. L. veitchiana
109b. Leaflike bracts herbaceous.

110a. Petiole of basal leaves distally narrowly dentate; leaflike bracts spatulate, with short petiole ................................................................. 108. L. anoleuca
110b. Petiole of basal leaves not winged or distally narrowly winged; wing margins entire; leaflike bracts ovate to lanceolate.
111a. Leaflike bracts ovate in basal half of synflorescence, distally lanceolate ...................... 106. _L. fischeri_
111b. Only a few leaflike bracts in base of synflorescence ovate, others lanceolate to linear ................................................................................................................................. 109. _L. sachalinensis_

101b. Leaflike bracts linear or linear-lanceolate, margin entire.

112a. Involucre campanulate or broadly campanulate, 8–12 × 4–9 mm, phyllaries 6–10, florets numerous.

113a. Leaves reniform, glabrous, basal lobes not divergent; pappus purplish brown.

114a. Ray florets present; involucre glabrous ................................................................. 112. _L. intermedia_
114b. Ray florets absent; involucre shortly pilose ..................................................... 113. _L. hopeiensis_

113b. Leaves hastate, shortly pilose, basal lobes divergent; pappus pale yellow or yellowish brown.

115a. Leaves abaxially and sheath shortly pilose; ray lamina oblong, to 6 mm wide .............. 114. _L. chinensis_
115b. Leaves shortly pilose on both surfaces; ray lamina linear, 1.5–2 mm wide.

116a. Involucre outside glabrous; pappus pale yellow ............................................... 115. _L. longistylata_
116b. Involucre outside shortly white pilose; pappus yellowish brown ......................... 116. _L. ruficoma_

112b. Involucre cylindric, 6–12 × 2–4 mm, phyllaries 4–6, florets 5–15, if phyllaries to 8 then involucre broader, 17–19 × ca. 8 mm.

117a. Leaves divided.

118a. Leaves palmatisect; synflorescence 30–60 cm; capitula 40–100; involucre 2–3 mm in diam.; phyllaries 4–6; ray florets 2 or 3 ....................................................... 117. _L. przewalskii_
118b. Leaves pinnately dissected; synflorescence 10–25 cm; capitula 7–15; involucre 8–10 mm in diam.; phyllaries 8 or 9; ray florets 4 or 5 ........................................... 118. _L. qiaojiaensis_

117b. Leaves undivided, margin dentate only.

119a. Ray florets absent; leaves shortly pilose on both surfaces ................................ 119. _L. confertiflora_
119b. Ray florets persistent; leaves glabrous or abaxially sometimes only shortly hairy on veins.

120a. Leaves cordate-hastate, coarsely 1- or 2-dentate on each outer margin of basal lobes; ray lamina linear-oblong or oblanceolate, 2–4 mm wide.

121a. Stem 3–6 mm in diam. at base; capitula with 6–15 florets; involucre 2.5–4 mm in diam., rarely broader ................................................................................... 114. _L. stenocephala_
121b. Stem slender, 2–3 mm in diam. at base; capitula with 4–6 florets; involucre to 2 mm in diam. ........................................................................................................ 121. _L. dolichobotrys_

120b. Leaves reniform or ovate- or cordate-hastate, margin denticulate; ray lamina linear, 1–1.5 mm wide.

122a. Leaves reniform, to 3.5 cm wide, basal lobes not divergent; capitula with 8 or 9 florets ... 122. _L. kojimae_
122b. Leaves ovate- or cordate-hastate, to 6 cm wide, basal lobes divergent; capitula with 5 florets .................................................................................. 123. _L. fargesii_


梨叶橐吾 li ye tuo wu

Stems 1 or 2, erect, 20–25 cm tall, 2.5–3 in diam. at base, glabrous except on synflorescence. Basal leaves petiolate; petiole to 16 cm, glabrous, base sheathed; leaf blade ovate or cordate-ovate, 5–7.5 × 4–6.3 cm, glabrous, both surfaces with prominent palmate veins, base rounded or shallowly cordate, margin regularly denticate, apex ciliate-acuminate. Stem leaves 1 or 2, similar but smaller, petiolate, with enlarged sheath. Capitula 3–5, in lax corymb; peduncles 1.3–1.4 cm, distally shortly brown pilose; leaflike bracts linear-lanceolate, 1–1.5 cm margin entire; supplementary bracts to 15, linear-lanceolate, 10–14 × ca. 1.5 mm wide, glabrous, margin entire. Involucre broadly campanulate, 1.6–2 × ca. 1.5 cm; phyllaries 10–12, in 2 rows, linear-lanceolate or lanceolate, 2–4 mm wide, margin dark brown, apex acute. Ray florets 6–10, yellow; lamina lanceolate, 20–25 × ca. 6 mm, with 6 or 7 brown veins, apex acuminate. Tubular florets numerous, 10–11 mm; tube ca. 4 mm. Pappus brownish or yellow, as long as tubular corolla. Fl. Aug–Oct.

- Mixed forests, between wet rocks; 1600–2500 m. Yunnan (Jingdong).


齿叶橐吾 chi ye tuo wu


Stem erect, 30–120 cm tall, ca. 1.2 cm in diam. at base, proximally glabrous, distally and branches of synflorescence white arachnoid-puberulent and shortly yellow pilose. Basal leaves petiolate; petiole 22–60 cm, stout, white puberulent, palmately veined with 5–7 principal veins, base sheathed; leaf blade abaxially grayish white, adaxially green, reniform, 7–30 × 12–38 cm, abaxially white puberulent, adaxially glabrous, margin regularly dentate, ciliate between teeth, apex rounded. Stem leaves similar but smaller; distal stem leaves sessile, broadly
sheathed. Synflorescence corymbose or compound corymbose, spreading; peduncles to 9 cm, white arachnoid-puberulent and shortly yellow pilose; leaflike bracts ovate to linear-lanceolate, margin denticulate; supplementary bracts absent. Capitula numerous. Involucre hemispheric, broader than long, 1.5–2.5 × 1.8–3 cm, outside densely white arachnoid-puberulent; phyllaries 8–14, closely imbricate, oblong, to 1 cm wide; inner phyllaries 2-carinate on convex outside and margin brown membranous. Ray florets yellow; lamina narrowly oblong, to 5 cm × 4–7 mm, apex acute; tube 7–12 mm. Tubular florets numerous, 1–1.8 cm. Achenes brown, cylindric, 7–10 mm, ribbed. Pappus reddish brown, as long as tubular corolla. Fl. and fr. Jul–Oct.

Grassy slopes, riversides, forest margins, forest understories, sometimes cultivated in gardens; 700–3200 m. Anhui, Gansu, Guangxi, Guizhou, ?Hebei, Henan, Hunan, Jiangxi, Shaanxi, Shanxi, Sichuan, Yunnan, Zhejiang [India, Japan, Korea; cultivated in North America].

Stream banks, grassland slopes, forest understories; 900–2300 m. Anhui, Fujian, Guangdong, Guangxi, ?Guizhou, ?Henan, Hubei, Hunan, Jiangxi, Taiwan, Zhejiang [Japan, Korea; cultivated in North America].


Grassland slopes, stream banks; 600–700 m. Fujian, Guangdong, Jiangxi, Taiwan, Zhejiang [Japan].

4. Ligularia hodgsonii J. D. Hooker, Bot. Mag. 89: t. 5417. 1863 ['hodgsoni'].

Stem erect, to 100 cm tall, 3–5 mm in diam. at base, proximally glabrous, distally and synflorescence white arachnoid-puberulent and shortly yellow pilose. Basal leaves petiolate; petiole greyish green, with purple spots, 20–100 cm, stout, unwinged, base sheathed; leaf blade abaxially pale green, adaxially green, reniform, ca. 40 cm in diam., abaxially initially white puberulent, glabrescent, adaxially glabrous or shortly pilose, veins palmate, palmatisect; lobes 3–5, palmatilobed; segments pinnate; segments pinnate, margin dentate, or rarely entire. Middle and distal stem leaves smaller, shortly petiolate, sheath ampelicaul. Distalmost stem leaves without sheaths, palmatipartite. Capitula 2–8, in corymb; supplementary and leaflike bracts usually absent; peduncles to 20 cm, white floccose-puberulent. Involute hemispheric, broader than long, 1.5–1.5 × 1.2–2.4 cm, outside white puberulent; phyllaries 9–12, closely imbricate, broadly oblong, to 8 mm wide, apex triangular, mucronate; inner phyllaries 2-carinate on convexit outside and margin broadly membranous. Ray florets yellow; lamina oblong, 4–6.5 × ca. 1 cm; tube 7–12 mm. Tubular florets numerous, ca. 2 cm; tube ca. 1 cm. Achenes cylindric, 7–16 mm, ribbed. Pappus reddish brown, as long as tube of tubular corolla. Fl. and fr. Apr–Sep. 2n = 60.

Stream banks, grassland slopes, forest understories; 600–2300 m. Anhui, Fujian, Guangdong, Guangxi, ?Guizhou, ?Henan, Hubei, Hunan, Jiangxi, Taiwan, Zhejiang [India, Japan, Korea; cultivated in North America].

Ligularia hodgsonii var. crenifera (Franchet) Handel-Mazzetti; L. hodgsonii var. pulchella (Pampanini) Handel-Mazzetti; L. hodgsonii var. sutchuenensis (Franchet) A. Henry; L. yesoensis (Franchet) Diels; L. yesoensis var. crenifera (Franchet) Diels; L. yesoensis var. pulchella Pampanini; L. yesoensis var. sutchuenensis (Franchet) Diels; Senecillus hodgsonii (J. D. Hooker) Kitamura; Senecio hodgsonii A. Henry; S. yesoensis Franchet; S. yesoensis var. crenifer Franchet; S. yesoensis var. sutchuenensis Franchet.

Stem erect, to 100 cm tall, 3–5 mm in diam. at base, proximally glabrous, distally and synflorescence white arachnoid-puberulent and shortly yellow pilose. Basal leaves petiolate; petiole 10–30 cm, slender, base narrowly sheathed; leaf blade reniform or cordate-reniform, (2–)5–8 × 4.5–13 cm, thick, glabrous, with palmate veins and conspicuous reticulate veins, base cordate, margin triangular-dentate or crenate and ciliate between teeth, apex rounded. Middle to distal stem leaves few, shortly petiolate or sessile, base broadly sheathed; leaf blade reniform, smaller than lower leaves. Capitula 1 to many, solitary or in corymb or compound corymb, branches 6–12 cm, fasciated; leaflike bracts navicular, 2–3 × ca. 1 cm; peduncles 0.5–2.5 cm; supplementary bracts linear-subulate, shorter than involucre. Involute broadly campanulate, longer than broad, 10–14 × 7–10 mm, outside glabrous or white arachnoid-puberulent, base truncate or rounded; phyllaries 8 or 9, closely imbricate, purplish red, oblong, 3–4 mm wide, brown ciliate, apex broadly triangular, sometimes mucronate; inner phyllaries 2-carinate on convex outside, margin broadly membranous. Ray florets yellow; lamina oblong, 15–25 × to 6 mm wide, apex obtuse and denticulate; tube ca. 4 mm. Tubular florets numerous, extending from involucre, 9–10 mm; tube 2–3 mm. Achenes cylindric, 7–8 mm, ribbed. Pappus reddish brown, as long as tubular corolla. Fl. and fr. Jul–Oct. 2n = 58.

One of us (Illarionova) believes that *Ligularia hodgsonii* is absent from China. Chinese specimens determined as *L. hodgsonii* belong to *L. dentata*. *Ligularia hodgsonii* differs from *L. dentata* by the structure of synflorescence (indeterminate (acropetal) raceme with long peduncles in *L. hodgsonii* vs. (basipetal) corymb in *L. dentata*) and by the navicular membranous bracts near each peduncle. According to Illarionova, *L. hodgsonii* occurs only in Japan and Russia (Far East).


*Ligularia hodgsonii* J. D. Hooker var. *cathfolia* (Maximowicz) Koidzumi; *Senecillis cathfolia* (Maximowicz) Kitamura; *Senecio cathfolius* (Maximowicz) Maximowicz.

Stem erect, 30–80 cm tall, 2.5–5 mm in diam. at base, proximally glabrous, distally white arachnoid-puberulent and shortly pilose. Basal leaves petiolate; petiole long and slender, 2–4 × as long as leaf blade, base sheathed; leaf blade cordate-reniform or cordate-ovate, 6–18 × 6–12 mm, glabrous, both surfaces with prominent palminate veins, base cordate, margin obtusely and sharply dentate, apex obtuse or acute. Middle to distal stem leaves 1 or 2, similar but smaller, petiolar base enlarged into a sheath. Capitula (1 or) 2–4, in corymb; leaflike bracts ovate-lanceolate, as long as peduncle, white puberulent; peduncles to 9 cm, shortly brown pilose; supplementary bracts narrowly lanceolate, as long as or longer than involucre. Middle to distal leaves smaller, only base broadly sheathed. Involucre hemispheric or campanulate, 1.2–1.3 × 1.3–1.8 cm, outside shortly brown pilose; phyllaries (5–)8–12, closely imbricate, ovate-oblong or narrowly lanceolate, as long as or longer than involucre. Ray florets yellow; lamina linear, 1.1–1.3 cm × 0.1 mm, apex acute; tube ca. 5 mm. Tubular florets numerous, 6–9 mm; tube 1/3–1/2 as long as campanulate limb. Pappus purplish brown, 1–2 mm, as long as or shorter than tube of tubular corolla. Fl. Aug–Sep.

- Grasslands, meadows, slopes; 3200–4200 m. Xizang (Zayū), NW Yunnan.


*Ligularia hodgsonii*אלי 乌苏里橐吾


*Ligularia hodgsonii* pulumi से (Far East).
9. Ligularia cuneata  

**Black Tufted Ligularia** (Chinese)

Stem erect, 50–100 cm tall, glabrous. Basal leaves not seen. Stem leaves petiolate; petiole 8–14 cm, base broadly sheathed; sheaths 7–12 cm, to 10 cm wide, submembranous, shortly white pilose; leaf blade reniform, 7–12 × 14–24 cm, abaxially shortly yellowish pilose, adaxially shortly white pilose, palmately veined, with 5–9 principal veins, base cordate, margin triangular-dentate, apex retuse. Distalmost stem leaves smaller, reniform. Capitula numerous, in compound corymbs; each peduncle with 1–5 capitula, densely shortly yellowish green pilose; leaflike bracts linear-lanceolate, 8–10 mm. Involucre hemispheric or campanulate, 9–12 × 10–15 mm, outside shortly white pilose; phyllaries many, equal, lanceolate or oblanceolat, 8–10 × 3–5 mm, submembranous, margin ciliate, apex acute or acuminate. Ray florets yellow; lamina obovate or cuneate, 7–8 × 3–6 mm, apex obtuse, 3- or 4-denticulate; tube 4–5 mm. Tubular florets numerous, yellowish brown, 6–7 mm; tube ca. 2 mm. Pappus white, as long as tubular corolla. Fl. Jun.

- **Stream banks**: ca. 3800 m. S Xizang (Gyirong).

10. Ligularia retusa  
Candolle, Prodr. 6: 314. 1838.

**Red Tufted Ligularia**

*Cremanthodium retusum* (Candolle) R. D. Good; *Ligularia nigropilosa* Kitamura; *Senecio retusus* (Candolle) Wallich ex J. D. Hooker.

Stem erect, 1 or 2, 38–100 cm tall, 3.5–12 mm in diam. at base, densely shortly black pilose or proximally glabrescent. Basal leaves petiolate; petiole 7.5–20 cm, shortly black pilose, base narrowly sheathed; leaf blade reniform, 2.2–7.5 × 4–15 cm, abaxially glabrous or shortly pilose along veins, adaxially glabrous, palmately veined, margin regularly denticate, between teeth shortly black pilose, apex retuse; sinus ca. 1/3 as long as leaf blade, basal lobes orbicular. Middle stem leaves similar but smaller, shortly petiolate, base broadly sheathed; sheath cymbiform, 4–9 × 1.5–3 cm, shortly black pilose, rarely glabrous; leaf blade 3–9.5 × 7–16 cm. Distalmost stem leaves only broadly sheathed. Capitula 2–11(27), solitary or in corymb, branches spreading; branches and peduncles black pilose; leaflike and supplementary bracts linear-lanceolate, less than 1 cm, shortly black pilose. Involucre hemispheric or campanulate, 1–1.5 × 1.5–2 cm, outside shortly black pilose; phyllaries 11–18, oblanceolate, 2–3 mm wide, apex acute or acuminate; inner phyllaries membranous at margin. Ray florets yellow; lamina oblong or oblanceolate, 9–10 × 3–4 mm, apex subtruncate, 2- or 3-denticulate. Tubular florets numerous, yellowish brown, 5–6 mm; tube 1–1.5 mm. Achenes pale brown, cylindrical, 7–10 mm, ribbed. Pappus yellow, as long as tubular corolla. Fl. and fr. Jul.–Oct.

Stream banks, grassland slopes, alpine grasslands; 3800–4500 m. SE Xizang, NW Yunnan [Bhutan, NE India, Nepal].

11. Ligularia stenoglossa  

**Grey Tufted Ligularia**


Stem erect, robust, to 150 cm tall, 1.5–2 cm in diam. at base, densely shortly yellow pilose or glabrescent. Basal leaves petiolate; petiole to 70 cm, densely shortly yellow pilose, base narrowly sheathed; leaf blade reniform, 10–15 × 22–29 cm, both surfaces shortly pilose, palmately veined, abaxially with prominent reticulate veins, margin triangular-dentate, apex rounded; sinus ca. 1/3 as long as leaf blade, broad, basal lobes orbicular. Middle stem leaves shortly petiolate; petiole to 3 cm, base broadly sheathed; sheath cymbiform, to 11 cm, ca. 5 cm wide; leaf blade reniform, to 21 cm wide. Distalmost stem leaves smaller, sessile. Corymb compound, spreading; branches to 10 cm, shortly yellow pilose. Involucre narrowly campanulate, 9–10 × 4–6 mm, outside glabrous; phyllaries 7–10, oblanceolate, 2.2–5.5 mm wide, brown ciliate, apex acute; inner phyllaries broadly membranous at margin. Ray florets 3–5, yellow; lamina 3–5-divided, segments filiform or linear, to 1.5 cm; tube ca. 6 mm. Tubular florets more numerous, to 10, yellowish brown, ca. 1 cm; tube as long as limb. Achenes brown, cylindrical, 5–6 mm. Pappus reddish brown, slightly shorter than tubular corolla. Fl. and fr. Sep.–Nov.

- **Forest understories, grassland slopes**: 2100–4000 m. NW and W Yunnan.

12. Ligularia oligonema  

**Violet Tufted Ligularia**

Stem erect, 55–150 cm tall, to 1.2 cm in diam. at base, shortly reddish brown pilose. Basal leaves petiolate; petiole to 53 cm, shortly brown pilose or glabrescent, base narrowly sheathed; sheath striate, to 2 cm wide; leaf blade reniform, 11–27 cm, to 50 cm wide, submembranous, glabrous, or abaxially shortly pilose, palmately veined, abaxially with 5 principal veins and prominent reticulate veins, margin regularly denticate, tips of teeth black mucronate, apex rounded or slightly retuse; sinus 1/3–1/2 as long as leaf blade, narrow, basal lobes orbicular, divergent. Middle and distal stem leaves shortly petiolate, base broadly sheathed; sheath ovate, ca. 2 cm in diam., shortly yellowish brown pilose; leaf blade reniform, to 18 cm wide. Corymb compound, spreading; branches to 15 cm. Capitula numerous; leaflike and supplementary bracts smaller, subulate; peduncles 3–14 mm. Involucrre cylindrical, 9–12 × 2–3 mm, outside glabrous; phyllaries 5, oblanceolate, 1.5–3 mm wide, apex acute; inner phyllaries membranous at margin. Ray florets 1 or 2, yellow; lamina linear, 1–1.5 cm, 2- or 3-divided, segments filiform, rarely undivided; tube ca. 6 mm. Tubular florets 4 or 5, 8–9 mm; tube ca. 4 mm. Achenes brown, cylindrical, ca. 6 mm.
Pappus white, shorter than tubular corolla or as long as tube. Fl. and fr. Sep–Oct.

- Forest understories, grassland slopes; 3000–4000 m. SW Sichuan, NW and W Yunnan.


隐舌橐吾 yin she tuo wu


Stem erect, 70–150 cm tall, 7–21 mm in diam. at base, proximally glabrous, distally shortly purplish red pilose. Basal leaves petiolate; petiole 9–32 cm, glabrous or shortly brown pilose, base sheathed; leaf blade reniform, 4–30 × 6–42 cm, glabrous or abaxially pale green and initially shortly brown pilose, adaxially green, palmately veined, with 5 principal veins and prominent reticulate veins, margin regularly dentate, between teeth brown ciliate, apex rounded; sinus ca. 1/3 as long as leaf blade, broad. Middle and distal stem leaves shortly petiolate, base broadly sheathed; leaf blade reniform. Distalmost stem leaves smaller, sessile, base broadly sheathed. Corymbs compound, spreading, to 17 cm; branches and peduncles to 12 cm, densely shortly brown pilose. Capitula numerous; leaflike and supplementary bracts linear, to 23 cm, fasciated, densely shortly yellowish brown pilose. Involucre narrowly cylindric, 7–9 × 3–4 mm, outside glabrous or glabrescent; phyllaries 2 or 3–5, oblong, 1–2 mm wide, brown ciliate, margin membranous, apex triangular-acute. Florets (2 or)3–5, yellow; ray floret solitary or absent, tubular, split on one side, as long as tubular florets. Tubular florets 9–10 mm; tube 3–4 mm. Achenes brown, cylindric, to 8 mm. Pappus white, slightly shorter than tubular corolla. Fl. and fr. Jul–Sep.

- Stream banks, forest understories, grassland slopes; 2400–3900 m. SW Sichuan, NE and NW Yunnan.


弯舌橐吾 wan bao tuo wu

_Senecio curvisquamus_ (Handel-Mazzetti) C. C. Chang; _S. curvisquaman var. robustus_ C. C. Chang.

Stem erect, to 70 cm tall, 9–27 mm in diam. at base, shortly yellowish brown pilose. Basal leaves petiolate; petiole to 24 cm, ca. 5 cm wide, shortly yellowish brown pilose, base sheathed; leaf blade reniform, 8–9 × 18–20 cm, both surfaces sparsely shortly pilose, palmately veined, base cordate, margin dentate, between teeth ciliate, apex retuse; sinus ca. 1/3 as long as leaf blade, broad, basal lobes orbicular. Middle and distal stem leaves shortly petiolate; sheath enlarged into a leaf blade, to 6 cm wide, not amplexicaul, margin laciniate; leaf blade reniform, 3–8 cm, to 10 cm wide, abaxially shortly pilose. Corymbs compound, branched, not spreading; branches erect, to 23 cm, fasciated, densely shortly yellowish brown pilose. Capitula numerous; leaflike and supplementary bracts smaller, subulate; peduncles 2–10 mm, shortly yellowish brown pilose. Involute narrowly turbinate, 6–8 mm, mouth ca. 6 mm in diam.; phyllaries 7–10, lanceolate or linear-lanceolate, outer side glabrous, apex ciliate-acuminate, curved, dark brown, ciliate; inner phyllaries 2–2.5 mm wide, margin membranous. Ray floret 1, yellow; lamina short, narrow, as long as tubular florets, rarely absent. Tubular florets 8 or 9, 6–10 mm, wholly extending from involucre in fruit; tube ca. 2.5 mm. Achenes brown, cylindric, to 7 mm. Pappus brown above, purplish brown below, as long as tube of tubular corolla. Fl. and fr. Jul–Sep.

- Stream banks, forest understories, grassland slopes; ca. 4000 m. NW Yunnan.


独舌橐吾 du she tuo wu

_Stem erect, 50–70 cm tall, 6–8 mm in diam. at base, shortly yellowish brown pilose. Basal leaves petiolate; petiole 19–26 cm, shortly yellowish brown pilose, base sheathed; sheath usually reddish purple, entire; leaf blade peltate, broadly reniform, 9–15 × 20–30 cm, abaxially shortly pilose, adaxially glabrous, palmately veined, margin dentate, apex retuse; sinus ca. 1/3 as long as leaf blade, broad, basal lobes divergent. Middle and distal stem leaves shortly petiolate or sessile; sheath enlarged, cucullate; leaf blade smaller, reniform. Distalmost stem leaves only sheathed. Corymbs compound, not spreading, to 20 cm; branches to 15 cm, fasciated, shortly yellowish brown pilose. Capitula numerous; leaflike and supplementary bracts linear; peduncles 7–10 mm, shortly yellowish brown pilose. Involucre narrowly cylindric, 7–9 × 3–4 mm, outside shortly pilose; phyllaries 5–8, lanceolate or oblong, apex acute or obtuse; inner phyllaries brown, margin broadly membranous. Ray floret 1, yellow; lamina oblong or obovate-oblong, 5–6 × ca. 3 mm, apex obtuse. Tubular florets 6–10, 5–6 mm; tube ca. 2 mm. Achenes cylindric, to 7 mm. Pappus white to pale yellow, 3–4 mm, shorter than tubular corolla. Fl. and fr. May–Nov.

- Stream banks, bogs, forest understories, grassland slopes, gravely slopes; 3400–3900 m. NW Yunnan.


横叶橐吾 heng ye tuo wu

_Stem erect, 50–100 cm tall, 6–25 mm in diam. at base, densely shortly rufous pilose. Basal leaves petiolate; petiole to 30 cm, densely shortly rufous pilose, base sheathed; sheath to 11 × ca. 1.5 cm; leaf blade orbicular or orbicular-reniform, 7–24.5 × 11–38 cm, both surfaces shortly pilose, palmately veined, margin denticulate, apex rounded or retuse; sinus ca. 1/3 as long as leaf blade, broad, basal lobes orbicular. Middle stem leaves shortly petiolate or sessile; sheath enlarged, broadly ovate, ca. 5 cm, to 13 cm wide, denticulate; leaf blade smaller, reniform. Distalmost stem leaves only broadly sheathed. Corymbs compound; branches spreading or fasciated, proximal ones to 11 cm. Capitula numerous; leaflike and supplementary bracts linear-sesilulate; peduncles to 15 mm. Involucre narrowly campanulate, 6–8 × ca. 6 mm, outside glabrous or glabrescent; phyllaries 5–7, oblong or oblong-lanceolate, margin membranous, apex acute. Ray florets 3–6, yellow; lamina narrowly oblong, 3–6 × 1.5–2 mm, apex 2- or 3-denticulate. Tubular florets...
to 15, ca. 6 mm; tube ca. 2 mm. Pappus white or brown, as long as tube of tubular corolla. Fl. Jun–Jul.

- Stream banks, grassland slopes, alpine grasslands; 3400–4500 m. NW Yunnan.


奇异橐吾 qi yi tuo wu

Stem erect, to 90 cm tall, ca. 6 mm in diam. at base, proximally glabrous, distally arachnoid-puberulent. Basal leaves petiolate; petiole to 32.5 cm, base narrowly sheathed; leaf blade orbicular or broadly ovate, 10–25 cm in diam., glabrous or abaxially pale green and initially hairy, palmately veined, 3–8(or 17)-palmatisect or palmatilobed; lobes 3-divided, lobules pinnatisect; segments linear-oblong, 7–15 × 3–6(–8) mm, margin revolute, apex acute. Stem leaves 2 or 3, similar but smaller, shortly petiolate, ± divided; sheath enlarged, cymbiform, glabrous, margin entire. Corymbs compound, slightly spreading; branches and peduncles shortly yellowish brown pilose. Involucres campanulate-turbinate, 9–13 × 6–16 mm, outside shortly yellowish brown pilose, rarely glabrous; phyllaries 6–12, dark brown, oblong or lanceolate, apex acute; inner phyllaries brown membranous at margin. Florets numerous, yellow, all tubular, 7–9 mm; tube ca. 3 mm; limb ca. 2 mm wide. Achenes yellowish brown, cylindric, to 7 mm, narrowly ribbed. Pappus white or brown when mature, 3–4 mm, as long as tube of tubular corolla. Fl. Jun–Jul.

- Stream banks, swamps; 3700–4100 m. SW Gansu, SE Qinghai, NW Sichuan.


云南橐吾 yun nan tuo wu


Stem erect, 30–56 cm tall, slender, 2.5–4 mm in diam. at base, shortly brown pilose, or proximally glabrous. Basal leaves 2 or 3, petiolate; petiole 15–41 cm, slender, glabrous, base narrowly long sheathed; sheath ca. 8 cm; leaf blade abaxially pale green, adaxially green, reniform or orbicular-reniform, 3–6 × 7–11 cm, glabrous, palmately veined, margin coarsely triangular-dentate, tips of teeth black mucronate, apex rounded; sinus ca. 1/3 as long as leaf blade, broad. Stem leaves 2 or 3, similar but smaller, petiole to 21 cm, slender, base sheathed; sheath enlarged, cucullate, 2.5–4 cm, to 2 cm wide, or lower narrower. Capitula 9–14, in corymb; branches shorter, fasciated, shortly brown pilose; leaflike and supplementary bracts linear hairs as on peduncles. Involucre campanulate-turbinate, 8–13 × 6–16 mm, outside shortly yellowish brown pilose, rarely glabrous; phyllaries 6–12, dark brown, oblong or lanceolate, apex acute; inner phyllaries brown membranous at margin. Florets numerous, yellow, all tubular, 7–9 mm; tube ca. 3 mm; limb ca. 2 mm wide. Achenes yellowish brown, cylindric, to 7 mm, narrowly ribbed. Pappus white, as long as tubular corolla. Fl. and fr. May–Oct.

- Grassly slopes, forest understoreys, between rocks; 3100–4000 m. NW Yunnan.


褐毛橐吾 he mao tuo wu


Stem erect, to 150 cm tall, 1–2 cm in diam. at base, shortly brown pilose. Basal leaves petiolate; petiole purplish red, to 50 cm, robust, to 1 cm in diam., shortly brown pilose, base narrowly long sheathed; leaf blade adaxially green, reniform or orbicular-reniform, 14–50 cm in diam. or broader than long, peltate, abaxially densely shortly pilose, adaxially glabrous, palmately veined, margin regularly dentate, apex rounded or retuse; sinus ca. 1/3 as long as leaf blade, broad, basal lobes orbicular. Middle stem leaves similar but smaller, to 18 cm wide, shortly petiolate, apex retuse; sheath enlarged, 7–10 cm, to 10 cm in diam., shortly brown pilose. Distalmost stem leaves only broadly sheathed. Corymbs compound, to 50 cm, much branched; branches numerous, densely shortly brown pilose, each branch with 3–7 capitula; peduncles to 3 cm, shortly brown pilose. Capitula numerous; leaflike and supplementary bracts filiform, glabrous. Capitula to 30; leaflike and supplementary bracts filiform, glabrous. Involucres campanulate-turbinate, 10–13 × 7–12 mm, outside shortly pilose; phyllaries 8 or 9, purple, oblong or lanceolate, 3–5 mm wide, margin membranous, apex acute. Ray florets absent. Tubular florets numerous, 6–7 mm, extending from involucres; tube 1–1.5 mm. Achenes brown, cylindric, 7–8 mm. Pappus brown, shorter than tubular corolla, usually deciduous. Fl. and fr. Sep–Oct.

- Grassly slopes, forest understoreys, alpine grasslands; 3400–4500 m. Yunnan.

1a. Leaves 3–8-palmatipartite, lobes 3-divided.......................... 17a. var. paradoxa

1b. Leaves palmatifolied, lobes 17, 1.5–3 cm wide, lobed or dentate ....... 17b. var. palmatifida

17a. Ligularia paradoxa var. paradoxa

奇异橐吾(原变种) qi yi tuo wu (yuan bian zhong)

Cremanthodium pteridophyllum Y. L. Chen.

Leaves 3–8-palmatifoliate; lobes 3-divided.

- Grassly slopes, forest understoreys, alpine grasslands; 3400–4500 m. NW Yunnan.

17b. Ligularia paradoxa var. palmatifida

奇异橐吾 半裂变种 qian chi tuo wu (ban lie)


半裂橐吾 ban lie tuo wu

Leaves palmatifolied; lobes 17, 1.5–3 cm wide, lobed or dentate.

- Yunnan (Zhongdian).


褐毛橐吾 he mao tuo wu


Stem erect, to 150 cm tall, 1–2 cm in diam. at base, shortly brown pilose. Basal leaves petiolate; petiole purplish red, to 50 cm, robust, to 1 cm in diam., shortly brown pilose, base narrowly long sheathed; leaf blade adaxially green, reniform or orbicular-reniform, 14–50 cm in diam. or broader than long, peltate, abaxially densely shortly pilose, adaxially glabrous, palmately veined, margin regularly dentate, apex rounded or retuse; sinus ca. 1/3 as long as leaf blade, broad, basal lobes orbicular. Middle stem leaves similar but smaller, to 18 cm wide, shortly petiolate, apex retuse; sheath enlarged, 7–10 cm, to 10 cm in diam., shortly brown pilose. Distalmost stem leaves only broadly sheathed. Corymbs compound, to 50 cm, much branched; branches numerous, densely shortly brown pilose, each branch with 3–7 capitula; peduncles to 3 cm, shortly brown pilose. Capitula numerous; leaflike and supplementary bracts filiform, glabrous. Capitula to 30; leaflike and supplementary bracts filiform, glabrous. Involucres campanulate-turbinate, 10–13 × 7–12 mm, outside shortly pilose; phyllaries 8 or 9, purple, oblong or lanceolate, 3–5 mm wide, margin membranous, apex acute. Ray florets absent. Tubular florets numerous, 6–7 mm, extending from involucres; tube 1–1.5 mm. Achenes brown, cylindric, 7–8 mm. Pappus brown, shorter than tubular corolla, usually deciduous. Fl. and fr. Sep–Oct.

- Grassly slopes, forest understoreys, between rocks; 3100–4000 m. NW Yunnan.


浅齿橐吾 qian chi tuo wu

Senecio potaninii C. Winkler, Trudy Imp. S.-Peterburgsk.
Stems 1 or 2, erect, to 31 cm tall, ca. 3 mm in diam. at base, proximally glabrous, distally and branches of synflorescence shortly brown pilose. Basal leaves petiolate; petiole often purplish red, to 11 cm, glabrous, base narrowly sheathed; leaf blade abaxially purplish red, broadly reniform, 4.5–6 × 9–10.5 cm, subleathery, abaxially hairy only along veins, reticulate veins prominent and white, adaxially glabrous, palmately veined, base shallowly cordate, margin undulate-crenate and ciliate, apex rounded or retuse; sinus ca. 1/4 as long as leaf blade, broad. Middle stem leaves smaller, reniform; petiole enlarged into a sheath; sheath 2.5–5 cm, to 2.5 cm wide. Distalmost stem leaves with only enlarged sheath or very rarely lanceolate, without sheath. Capitula (3–)7–9 in corymb; leaflike and supplementary bracts linear; peduncles 1–2 cm. Involucre campanulate, 8–15 mm, mouth to 1.5 cm in diam., glabrous, base narrowly sheathed; mouth of sheath shallowly dentate, apex acute or acuminate; inner phyllaries membranous at margin. Florets 20–30, yellow, all tubular, 9–10 mm; tube ca. 5 mm. Achenes brown, cylindric, 5–7 mm. Pappus white, as long as tubular corolla. Fl. Jul.

- Grasslands; ca. 4000 m. SW Gansu, N Sichuan.


Stems 1 or 2, erect, 7–45 cm tall, ca. 2 mm in diam. at base, proximally glabrous, distally shortly purplish pilose and white arachnoid-puberulent. Basal leaves petiolate; petiole 5–24 cm, slender, base sheathed; leaf blade reniform, (2–)4–12.5 cm wide, abaxially shortly pilose only along veins, adaxially glabrous, palmate veins prominent abaxially, margin regularly undulate-dentate, apex rounded; sinus ca. 1/3 as long as leaf blade, narrow. Middle stem leaves smaller, reniform; petiole short, with enlarged sheaths. Distalmost stem leaves only enlarged sheathed; mouth of sheath shallowly dentate at margin. Capitula 3–6 in corymb; leaflike and supplementary bracts linear, shorter than peduncle and involucre; peduncles 4–40 mm, densely shortly purplish pilose and white arachnoid-puberulent. Involucre campanulate, 8–15 mm, mouth to 1.5 cm in diam., outside glabrous; phyllaries ca. 13, in 2 rows, purplish red, oblong, petaloid, 2–4 mm wide, apex acute; inner phyllaries narrowly membranous at margin. Florets numerous, yellow, all tubular, 5–10 mm; tube 1–2 mm. Achenes brown, cylindric, 5–7 mm. Pappus white, as long as tubular corolla. Fl. Aug.

- Grasslands; ca. 4000 m. NW Sichuan, Xizang.


Stems 1 or 2, erect, often purple, to 24 cm tall, 2–4 mm in diam. at base, proximally glabrous, distally shortly brown pilose. Basal leaves petiolate; petiole 21.5 cm, slender, glabrous, base narrowly sheathed; leaf blade abaxially pale purple, adaxially green, reniform, 1.5–4.5 × 4.5–9.5 cm, abaxially shortly pilose only along veins, adaxially glabrous, palmately veined, with conspicuous reticulate veins, margin regularly sharply dentate, apex rounded or retuse; sinus narrow, 1/3(–1/2) as long as leaf blade, basal lobes orbicular. Stem leaves 1 or 2, smaller, reniform; petiole 11–15 cm, base enlarged sheathed; sheath to 3.5 cm, as long as broad or narrower. Capitula 1–4, in corymb or solitary; leaflike bract lanceolate, as long as pedicels; supplementary bracts 3 or 4, subulate, shorter than involucre; peduncles divaricately branched, to 1 cm, densely shortly brown pilose. Involucre broadly campanulate or hemispheric, ca. 8 mm, to 2 cm wide, outside glabrous or shortly white pilose; phyllaries ca. 15, in 2 rows, dark brown, elliptic, 2–3 mm wide, margin shallowly denticulate, apex obtuse or acute; inner phyllaries membranous at margin. Florets numerous, yellow, all tubular, 5–6 mm; tube ca. 2 mm. Achenes ca. 5 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jul.–Aug.

- Alpine grasslands, grassy slopes, rocky slopes; 3700–4800 m. NW Yunnan.


Stem erect, to 90 cm tall, 3–5 mm in diam. at base, proximally glabrous, distally umbrella-branched, shortly purplish brown pilose. Basal leaves petiolate; petiole 6–25 cm, slender, glabrous, base narrowly sheathed; leaf blade orbicular-reniform or reniform, 1.5–10 × (3–)6–15 cm, abaxially pilose, adaxially glabrescent, palmately veined, margin triangular-dentate, apex rounded; sinus ca. 1/3 as long as leaf blade, broad, basal lobes oblong, to 10 cm, margin coarsely dentate. Stem leaves smaller, reniform, petiolate, sheath amplexicaul. Corymb compound, spreading or narrowed; branches to 13 cm; leaflike and supplementary bracts linear, 4–10 mm. Peduncles 3–7 mm, shortly purplish brown pilose. Capitula 5–8 or more. Involucre narrowly cylindric, 8–10 × 2–3 mm, outside shortly purplish brown pilose; phyllaries 4 or 5, in 2 rows, oblong, 2–3 mm wide, apex obtuse; inner phyllaries membranous at margin. Florets 4 or 5, purplish red, all tubular, 8–9 mm; tube 3–4 mm. Achenes yellowish brown, cylindric, 5–7 mm. Pappus yellowish brown, slightly shorter than tubular corolla. Fl. and fr. Aug.

- Grassy slopes, forest understories; 3200–4200 m. Xizang [NE India, Myanmar].

2a. Capitula numerous, in compound corymb; basal leaves 6–15 cm wide .................................................. 23a. var. dux

2b. Capitula 5–8, in corymb; basal leaves 3–5 cm wide .................................................. 23b. var. minima

23a. Ligularia dux var. dux

紫花橐吾 zi hua tuo wu

Stems 1 or 2, erect, often purple, to 24 cm tall, 2–4 mm in diam. at base, proximally glabrous, distally shortly brown pilose. Basal leaves petiolate; petiole 21.5 cm, slender, glabrous, base narrowly sheathed; leaf blade abaxially pale purple, adaxially green, reniform, 1.5–4.5 × 4.5–9.5 cm, abaxially shortly pilose only along veins, adaxially glabrous, palmately veined, with conspicuous reticulate veins, margin regularly sharply dentate, apex rounded or retuse; sinus narrow, 1/3(–1/2) as long as leaf blade, basal lobes orbicular. Stem leaves 1 or 2, smaller, reniform; petiole 11–15 cm, base enlarged sheathed; sheath to 3.5 cm, as long as broad or narrower. Capitula 1–4, in corymb or solitary; leaflike bract lanceolate, as long as pedicels; supplementary bracts 3 or 4, subulate, shorter than involucre; peduncles divaricately branched, to 1 cm, densely shortly brown pilose. Involucre broadly campanulate or hemispheric, ca. 8 mm, to 2 cm wide, outside glabrous or shortly white pilose; phyllaries ca. 15, in 2 rows, dark brown, elliptic, 2–3 mm wide, margin shallowly denticulate, apex obtuse or acute; inner phyllaries membranous at margin. Florets numerous, yellow, all tubular, 5–6 mm; tube ca. 2 mm. Achenes ca. 5 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jul.–Aug.

- Alpine grasslands, grassy slopes, rocky slopes; 3700–4800 m. NW Yunnan.

23b. var. minima

Plants 25–40 cm tall. Stem slender, 1.5–2.5 mm in diam. at base. Leaves reniform, 2–3 × 3–5 cm, base subtruncate. Capitula 5–8, in corymb.


纤细橐吾 xian xi tuo wu

Stem erect, 42–65 cm tall, 1.5–3 mm in diam. at base, proximally glabrous, distally and synflorescence densely shortly brown pilose. Basal leaves petiolate; petiole to 30 cm, slender, glabrous, base narrowly sheathed; leaf blade ovate-cordate or subreniform, 4.5–6 cm, base to 11 cm wide, abaxially sparsely shortly pilose, adaxially glabrous, palmate veins prominent abaxially, base cordate, margin coarsely irregularly triangular-dentate, apex acute. Middle stem leaves petiolate; petiole 5–10 mm; sheath enlarged, ovate, 17–25 × 8–10 cm; leaf blade reniform, 2.5–5 × 4–5 cm, base shallowly cordate or subtruncate, margin denticulate, apex rounded. Distalmost stem leaves ovate, base not amplexicaul. Compound corymbs spreading; branches to 6 cm; leaflike and supplementary bracts subulate, much shorter; peduncles to 2 cm, densely shortly brown pilose. Capitula 9–13. Involucre cylindric, 9–12 mm, to 4 mm wide, outside glabrous, base shortly brown pilose; phyllaries 5, in 2 rows, oblong, 1.5–3 mm wide, margin membranous, apex acute. Florets 5 or 6(–8), yellow, all tubular, 6–7 mm; tube as long as limb. Achenes brown, linear, 6–8 mm. Pappus white, as long as tubular corolla. Fl. and fr. Sep–Oct.


东久橐吾 dong jiu tuo wu

Stem erect, 60–90 cm tall, distally branched, densely shortly brown pilose. Basal leaves petiolate; petiole to 30 cm, slender; leaf blade abaxially pale green, adaxially dark green, broadly reniform, ca. 10 cm, to 17 cm wide, abaxially shortly brown pilose along veins, palmately veined, with 9 principal veins and slender reticulate veins, base broadly cordate, margin sharply dentate, apex rounded; basal lobes orbicular. Middle stem leaves petiolate; sheath lanceolate; leaf blade reniform, ca. 7 cm. Distalmost stem leaves bracteal, spatulate, narrowly shortly petiolate, margin entire. Compound corymbs clustered, ca. 5 cm wide; leaflike and supplementary bracts filiform; peduncles to 5 mm, shortly purplish brown pilose. Capitula numerous. Involucre brown, narrowly cylindric, ca. 1 cm, outside glabrous; phyllaries 3, linear, margin brown or purplish brown membranous, apex obtuse. Florets 3, all tubular, longer than involucr; tube as long as limb. Pappus reddish brown, slightly shorter than tubular corolla. Fl. and fr. Aug.


黄毛橐吾 huang mao tuo wu


Stem erect, robust, to 150 cm tall, 1–1.5 cm in diam. at base, densely yellow shortly pilose. Basal leaves petiolate; petiole to 38 cm, shortly yellow pilose, base enlarged sheathed; leaf blade orbicular-reniform, 7–21 cm, to 50 cm wide, glabrous, palmately veined, abaxially with prominent reticulate veins, margin densely minutely denticulate, apex rounded or retuse; sinus ca. 1/3 as long as leaf blade, narrow. Middle stem leaves shortly petiolate, base enlarged sheathed; sheath broadly ovate, to 7 × ca. 4 cm, shortly yellow pilose; leaf blade reniform, 2.7–6.5 × to 13 cm. Compound corymbs ca. 38 cm; branches densely shortly yellow pilose; leaflike and supplementary bracts filiform-subulate, to 1.3 cm; peduncles 5–15 mm, shortly yellow pilose. Capitula numerous. Involucre narrowly campanulate, 6–8 mm in diam., outside shortly yellow pilose; phyllaries 8–10, narrowly lanceolate, 9–15 × 2–3(–4) mm, margin narrowly membranous, apex acuminata. Florets more than 20, yellow, all tubular, 8–9 mm; tube ca. 4 mm. Achenes brown, cylindric, 5–8 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Sep.


Stem erect, 25–64 cm tall, to 8 mm in diam. at base, densely shortly brown pilose. Basal leaves petiolate; petiole to 27 cm, shortly brown pilose, base narrowly sheathed; sheath ca. 12 cm; leaf blade reniform, 3–10 × 7–22.5 cm, glabrous or abaxially pubescent along veins, palmately veined, margin irregularly coarsely dentate and brown ciliate, apex rounded; teeth triangular, 2–6 mm; sinus ca. 1/3 as long as leaf blade, broad, basal lobes suborbicular. Middle stem leaves smaller, shortly petiolate; sheath enlarged, brown pubescent; leaf blade reniform, ca. 6.5 × 12 cm, margin coarsely triangularly dentate, apex rounded or retuse; teeth to 7 mm. Compound corymbs spreading, to 15 cm, branched; leaflike and supplementary bracts subulate; peduncles ca. 2 cm, densely yellow pubescent. Capitula numerous. Involucre narrowly campanulate or cylin-

Stem erect, 50–80 cm tall, to 7 mm in diam. at base, glabrous or distally and sometimes at base shortly brown pilose. Basal leaves petiolate; petiole to 30 cm, slender, glabrous, base enlarged sheathed; leaf blade abaxially pale green, adaxially green, reniform, 5–16 × 8–20 cm, abaxially glabrous or pubescent along veins, adaxially glabrous, palmately veined, margin deeply coarsely dentate, apex retuse; teeth irregularly triangular-lanceolate, to 2 cm wide, apex blackish purple and mucronate, recurved; sinus ca. 1/3 as long as leaf blade, broad, basal lobes subdistant. Middle stem leaves smaller, reniform, shortly petiolate, sheath enlarged, broadly ovate, margin entire. Distalmost stem leaves only enlarged sheathed. Compound corymbs branched; branches to 15 cm, densely shortly pilose; leaflike and supplementary bracts linear-subulate, shorter; peduncles to 1.5 cm, slender, densely shortly pilose. Capitula numerous. Involucres narrowly cylindric, ca. 1 cm, rarely to 1.3 cm, 3–4 mm wide, outside glabrous; phyllaries 5–8, in 2 rows, linear-lanceolate, 1.5–2 mm wide, purple ciliate, apex acute; inner phyllaries membranous at margin. Florets 6–8, yellow, all tubular, 8–9 mm; tube slightly longer than limb. Achenes yellowish brown, cylindric, 4–5.5 mm. Pappus white, ca. 7 mm, shorter than tubular corolla. Fl. Sep.

- Grassy slopes; 2600–4300 m. SW Gansu, Qinghai (Xionghua).


Stem erect, 170 cm tall, to 1 cm in diam. at base, glabrous or distally yellow pilose. Basal leaves petiolate; petiole shortly yellow pilose, to 31 cm, base enlarged sheathed; leaf blade reniform or cordate, 5–16 × 7–50 cm, glabrous, palmately veined, with 3–5 principal veins and prominent reticulate veins, margin irregularly dentate, apex rounded; sinus ca. 1/3 as long as leaf blade, broad, basal lobes orbicular. Middle stem leaves petiolate; petiole 4–9.5 cm, densely yellowish green pilose; sheath much enlarged, to 5 × ca. 4 cm, slightly yellow pilose, mouth of sheath entire; leaf blade reniform, 4–10 × 8–20 cm, margin denticulate, apex retuse. Distalmost stem leaves only sheathed. Compound corymbs to 20 cm; branches spreading, pubescent; leaflike and supplementary bracts minute, linear-subulate; peduncles to 1 cm, densely yellow pilose. Capitula numerous. Involucres narrowly cylindric, 8–13 × 3–4 mm, outside glabrous; phyllaries 5, in 2 rows, oblong, ciliate, apex triangular-acute; inner phyllaries broadly membranous at margin. Florets (5 or)6( or 7), yellow, all tubular, 6–9 mm, wholly extending from involucre; tube as long as limb. Achenes brown, cylindric, 5–7 mm. Pappus white or lower part yellow, as long as tube of tubular corolla. Fl. and fr. Jul.–Sep.

- Stream banks, forest understories, grasslands, alpine meadows; 1900–4300 m. S Gansu, Ningxia (Jingyuan). "Shaansi, N to SW Sichuan, NW Yunnan.


Stem erect, 80–100 cm tall, to 1 cm in diam. at base, distally white arachnoid-puberulent and shortly yellow pilose. Basal leaves petiolate; petiole white arachnoid-puberulent, 10–50 cm, base enlarged sheathed; leaf blade peltate, reniform, 7–30 × 13–38(–80) cm, abaxially white arachnoid-puberulent, adaxially glabrous, palmately veined, abaxially with prominent reticulate veins, margin sharply dentate, apex rounded; sinus ca. 1/3 as long as leaf blade, broad, basal lobes suborbicular. Distal stem leaves petiolate; petiole 5–20 cm; sheath enlarged, 4–6 × 2–2.5 cm, white arachnoid-puberulent. Compound corymbs spreading; branches numerous, divaricate, blackish purple, white arachnoid-puberulent and shortly yellow pilose; leaflike and supplementary bracts subulate, minute; peduncles blackish purple, to 1.5 cm, often curved. Capitula numerous. Involucres narrowly cylindric, 10–12 × 3–4 mm, outside glabrous; phyllaries 5–7, in 2 rows, oblong, 2.5–3.5 mm wide, white ciliate, apex triangular, obtuse; inner phyllaries marginally brown or yellow, broadly membranous. Florets 6–8, rarely to 12, yellow, all tubular, 7–9 mm, slightly extending from involucre; tube as long as limb. Achenes brown, cylindric. Pappus white or yellowish, 6–7 mm, slightly shorter than tubular corolla. Fl. Jul.–Sep.

- Forest understories, slopes, alpine meadows; 2400–3900 m. S Gansu, W Hubei, SW and Sichuan, NE to NW Yunnan.


Stem erect, 60–90 cm tall, to 1 cm in diam. at base, slightly yellow pilose. Basal leaves petiolate; petiole densely shortly yellowish brown pilose, to 28 cm, base long sheathed; leaf blade orbicular-reniform, ca. 17 × 24 cm, abaxially with prominent palmate veins and shortly pilose, adaxially glabrous, margin coarsely dentate, apex rounded; sinus ca. 1/3 as long as leaf blade, narrow. Middle stem leaves petiolate; petiole to 7 cm; sheath enlarged, ca. 5 × 2.5 cm, densely shortly yellow pi-
loose; leaf blade smaller, reniform. Distalmost stem leaves sessile, ovate, without sheath. Compound corymbs spreading or clustered; leaflike and supplementary bracts linear, shortly pilose; peduncles to 2 cm, shortly yellow pilose. Capitula numerous. Involucre cylindrical or campanulato-cylindric, 10–12 × 4–6 mm, outside densely shortly yellow pilose; phyllaries 5–7, in 2 rows, oblong-lanceolate, ca. 2 mm wide, apex acute; inner phyllaries membranous at margin. Florets 5–9, yellow, all tubular, 7–8 mm, extending from involucre; tube ca. 5 mm; limb campanulate. Achenes brown, cylindric, 6–7 mm. Pappus pale brown, as long as tube of tubular corolla. Fl. Aug–Sep.

- Alpine stream banks; 3800–4800 m. Sichuan (Batang, Gongga-ling, Multi).

### 32. Ligularia runicifolia


藏橐吾 zang tuo wu


Stem erect, 40–100 cm tall, white lanate, 3–8 mm in diam. at base, with a circle of dense reddish brown lanate hairs. Basal leaves petiolate; petiole to 20 cm, winged or not, base slightly enlarged; leaf blade ovate-oblong, 10–19 × to 14.5 cm, both surfaces initially white lanate, glabrescent, adaxially or on both surfaces glabrescent, pinnately veined, with white prominent reticulate veins, base rounded or shallowly cordate, margin minutely denticulate, apex obtuse or rounded. Middle to distal stem leaves without petiole and sheath; leaf blade ovate or ovate-lanceolate, to 19 × 6–9 cm, base auriculate-amplexicaul or not, margin dentate, apex obtuse or acute. Distalmost stem leaves lanceolate or linear-lanceolate, to 6 cm, base not amplexicaul, margin subentire. Compound corymbs or panicles, initially clustered, later spreading; branches to 17 cm, white lanate; leaflike and supplementary bracts linear, shorter; peduncles shorter or to 3 cm, white lanate. Capitula numerous. Involucre turbinate or campanulato-turbinate, 5–9 mm, mouth to 1 cm in diam., outside green, glabrous or initially white pubescent; phyllaries 5–8, in 2 rows, dark brown, elliptic or oblong, apex acute; inner phyllaries broadly pale brown membranous at margin. Ray florets 3–7, yellow; lamina linear-oblong, 1–1.6 cm × 2–3 mm, apex rounded; tube 2–3 mm. Tubular florets numerous, 5.5–6.5 mm; tube 1–1.5 mm. Achenes pale brown, cylindric, 4–6 mm. Pappus white or pale brownish, as long as tubular corolla. Fl. and fr. Jul–Oct.

Lake shores, forest understories, scrub, slopes; 3700–4500 m. SW Sichuan, E Xizang [Nepal].

### 33. Ligularia songarica


准噶尔橐吾 zhun ga er tuo wu


Stem erect, 40–180 cm tall, white floccose-lanate or glabrous, 3–10 mm in diam. at base, with a circle of dense red-brown lanate hairs. Basal leaves petiolate; petiole 5–30 cm, without wings, floccose-lanate or glabrous, base narrowly sheathed; leaf blade sagittate, ovate-sagittate, or oblong-sagittate, 6–14(–35) × 4–11 cm, glabrous, pinnately veined, margin minutely denticulate, apex obtuse or acute; sinus broad, basal lobes coarsely dentate. Middle stem leaves similar but smaller, shortly petiolate, without wings, white lanate in axils. Distal stem leaves sessile, ovate-lanceolate to narrowly lanceolate, apex acuminate. Compound corymbs spreading; branches to 10 cm; leaflike and supplementary bracts narrowly lanceolate to subulate, 1–3 mm; peduncles 2–7 mm, glabrous. Capitula numerous. Involucre narrowly cylindric, 6–9 × (2.5–)4 mm, outside glabrous; phyllaries 5–7, in 2 rows, oblong or ovate-oblong, apex obtuse; inner phyllaries white membranous at margin. Ray florets 3 or 4, yellow; lamina oblong, 6–10 × 2–4 mm, apex rounded, minutely denticulate; tube 3–4 mm. Tubular florets 8–13, 6–10 mm, extending from involucre; tube 2–3 mm. Achenes yellowish, oblong, 4–5 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jun–Aug.

Stream banks, wet grasslands; 500–1100 m. Xinjiang (Tian Shan) [E Kazakhstan, Kyrgyzstan].

### 34. Ligularia thomsonii

C. B. Clarke, Compos. Ind. 205. 1876; _Ligularia bungei_ (Franchet) M. Popov; _L. thyrsoida_ (Ledebour) Candolle var. _alpina_ Bunge; _S. bungei_ Franchet.

Stem erect, 25–200 cm tall, white floccose-lanate, 5–10 mm in diam. at base, with a circle of dense reddish brown lanate hairs. Basal leaves petiolate; petiole 8–30 cm, white lanate or glabrous, base narrowly sheathed; leaf blade triangular- or ovate-cordate, 4–26 × 4–22 cm, abaxially sparsely white lanate, adaxially glabrous, veins palmate-pinnate, base cordate or hastate, margin minutely denticulate, apex obtuse; basal lobes suborbicular, slightly divergent. Middle to distal stem leaves shortly petiolate; petiole to 4 cm, base slightly enlarged; leaf blade smaller than basal leaves, ovate-cordate to narrowly ovate. Distal stem leaves narrowly lanceolate, 2–5 cm × 3–10 mm. Corymbs paniculate; branches to 7 cm, each branch with 2–4 capitula; leaflike and supplementary bracts subulate, 4–10 mm; peduncles 5–20 mm. Capitula numerous. Involucre narrowly cylindric or campanulate, 7–13 × 3–6 mm, outside glabrous; phyllaries 5–7, in 2 rows, dark brown, narrowly oblong or lanceolate, 2–4 mm wide, margin membranous, apex acute. Ray florets 1–3(4) mm; yellow; lamina narrowly oblong, to 1.8 cm × 3–4 mm, apex subentire; tube ca. 5 mm. Tubular florets 7–11, ca. 9 mm, extending from involucre; tube ca. 3 mm. Achenes yellowish. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Aug.

Grasslands, forest margins; 1500–3800 m. Xinjiang (Tian Shan) [Afghanistan, Kashmir, E Kazakhstan, Kyrgyzstan, Nepal, Pakistan, Tajikistan, Uzbekistan].

高山橐吾  gao shan tuo wu

Stem erect, 5–17 cm tall, white floccose-lanate, 1.5–3 mm in diam. at base, with a densely reddish brown lanate circle. Basal leaves petiolate; petiole 6–8 cm, white lanate, base narrowly sheathed; leaf blade broadly ovate or orbicular, 1.5–3.5 × 1.5–4 cm, abaxially sparsely lanate, pinnately veined, base coriace, margin entire, undulate, or dentate, apex obtuse. Middle to distal stem leaves shortly petiolate or sessile, narrowly ovate to lanceolate. Distal stem leaves linear-lanceolate. Leaf blade broadly ovate or orbicular, 1.5–3.5 × 0.9–1.3 × 1–1.5 cm, outside lanate at base; phyllaries 10–12, in 2 rows, lanceolate or linear, margin dark brown, apex acute or acuminate. Ray florets 10–14, yellow; lamina oblong, 1.4–2.5 cm, apex truncate or 3-lobed; tube 3–4 mm. Tubular florets numerous, 7–8 mm. Achenes yellowish white, cylindric, 4–6.5 mm. Pappus white, as long as tubular corolla.

● Xinjiang (Hami, Qitai).


哈密橐吾  ha mi tuo wu

Stem erect, ca. 35 cm tall, glabrous. Basal leaves petiolate; petiole ca. 15 cm; leaf blade broadly ovate-reniform, 5–7 × ca. 7 cm, pinnately veined, base coriace, margin dentate, apex obtuse. Middle stem leaves petiolate; petiole 2–4 cm, base enlarged into lamellate auricle; leaf blade ovate-oriicular to broadly ovate, 5–7 × 5–6 cm, base coriace or truncate, margin dentate, apex obtuse. Distal stem leaves narrowly triangular-ovate or oblong, 5–6 × 3–3.5 cm. Capitula solitary or in subcorymb or basipetal raceme, nodding; peduncles 1–10 cm. Involucre hemispheric, 1.8–2 × ca. 2.5 cm; phyllaries in 2 rows, oblong-lanceolate, margin densely shortly tomentose, apex acuminata. Ray florets numerous, yellow; lamina narrowly elliptic, ca. 20 × 5 mm, throat of tubular corolla with 4–6 yellow, flat hairs; tube ca. 2 mm. Tubular florets numerous, 8–9 mm. Achenes cylindric, ca. 6 mm. Pappus white, as long as tubular corolla. Fl. Jun–Jul.

● Xinjiang (Hami).

One of us (Illarionova) treats *Ligularia hamiica* as synonymous with *L. tianschanica*.


土鲁番橐吾  tu lu fan tuo wu

Stem erect, 20–40 cm tall, glabrous, 4–10 mm in diam. at base, with a densely reddish brown lanate circle. Basal leaves petiolate; petiole 7–10 cm, leaf blade broadly ovate or ovate-cordate, 3–4 × 3–6 cm, pinnately veined, base cordate, margin dentate, apex obtuse or rounded. Stem leaves sessile, ovate, base cordate, margin dentate, apex obtuse. Distal stem leaves ovate, lanceolate, or linear. Capitula 1 or 2, nodding. Involucre hemispheric, 1.3–1.5 × 2.4–2.6 cm; phyllaries in 2 rows, oblong-lanceolate to linear, 2.5 mm wide, margin shortly tomentose, apex acuminata. Ray florets numerous, yellow; lamina oblong, 1.5–2 cm × 5–7 mm, throat of tubular corolla glabrous; tube ca. 3 mm. Tubular florets numerous, 8–9 mm, tube 3–3.5 mm. Achenes cylindric, ca. 6 mm. Pappus white, as long as tubular corolla.

● Subalpine meadows; 2400–2800 m. Xinjiang.


新疆橐吾  xin jiang tuo wu

Stem erect, 35–40 cm tall, glabrous, ca. 1 cm in diam. at base, with a densely reddish brown lanate circle. Basal leaves petiolate; petiole longer than leaf blade; glabrous, base narrowly sheathed; leaf blade orbicular-ovate, orbicular-cordate, or orbicular, 2–7 × 2–8 cm, green, pinnately veined, glabrous, base coriace, margin irregularly sharply dentate, apex obtuse or rounded. Distal stem leaves shortly petiolate, triangular, 5–10 × 3–5 cm, base auriculate-amplexicaul; distalmost stem leaves bracteal. Capitula 5, in subcorymb; leaflike bracts triangular, supplementary bracts 1–3, subulate; peduncles 3–8 cm, upper floccose-lanate. Involucre hemispheric or cupular, ca. 1.4 × 2.5–2.7 cm, outside glabrous, only base pubescent; phyllaries 12 or 13, in 2 rows, lanceolate or ovate-oblong, apex acute or acuminata; inner phyllaries broadly white membranous at margin. Ray florets 13–15, yellow; lamina oblong, ca. 16 × 6 mm, apex acute; tube 3–4 mm. Tubular florets numerous, 8–9 mm; tube ca. 3 mm. Achenes brown, cylindric, ca. 5 mm, ?hairy between ribs. Pappus white, as long as tubular corolla. Fl. and fr. Jun–Jul.

● Subalpine meadows; 2400–2800 m. Xinjiang.

One of us (Illarionova) treats *Ligularia xinjiangensis* as synonymous with *L. tianschanica*.


天山橐吾  tian shan tuo wu

Stem erect, 20–40 cm tall, glabrous, 4–10 mm in diam. at base, with a densely reddish brown lanate circle. Basal and proximal stem leaves petiolate; petiole longer than leaf blade, 8–12 cm, glabrous, base narrowly sheathed; leaf blade orbicular-reniform, 1.8–4 × 3–4.5 cm, green, glabrous, pinnately veined, base coriace, margin irregularly sharply dentate, apex obtuse. Distal stem leaves shortly petiolate; leaf blade ovate or triangular, base auriculate-amplexicaul; distalmost stem leaves sessile, bracteal. Capitula 1–5, in subcorymb; leaflike bracts triangular; supplementary bracts 1–3, subulate; peduncles 1.5–8 cm, upper floccose-lanate. Involucre campanulate or hemispheric, 1–2 × 1.5–2.5 cm, outside glabrous, only base pubescent; phyllaries 12 or 13, in 2 rows, lanceolate or ovate-oblong, apex acute or acuminata; inner phyllaries broadly white membranous at margin. Ray florets 10–15, yellow; lamina oblong, ca. 20 × 5 mm, apex acute; tube 3–4 mm. Tubular florets numerous, ca. 8 mm; tube 2–3 mm. Achenes brown, cylindric, 5–6 mm, glabrous. Pappus white, as long as tubular corolla. Fl. and fr. Jun–Jul.

● Subalpine meadows; 2400–2700 m. Xinjiang.

One of us (Illarionova) treats *Ligularia tianschanica* as synonymous with *L. tianschanica*.
40. Ligularia thyrsoida (Ledebour) Candolle, Prodr. 6: 315. 1838.

塔序橐吾 ta xu tuo wu

*Cineraria thyrsoida* Ledebour, Icon. Pl. 2: 18. 1830; *Ligularia knorringiana* Pojarkova; *Seneclis thyrsoida* (Ledebour) Kitamura; *Senecio sibericus* Linnaeus f.

Stem erect, 30–125 cm tall, initially floccose-lanate, glabrescent, 5–7 mm in diam. at base, with a densely reddish brown lanate circle. Basal leaves petiolate; petiole sometimes purplish red, 10–26 cm, base narrowly sheathed; leaf blade abaxially pale green, adaxially green, triangular, sagittate, or triangular-ovate, 9–14 × 9–11 cm, glabrous, pinnately veined, base cordate, margin irregularly dentate, apex obtuse; basal lobes slightly divergent. Middle to distal stem leaves shortly petiolate or sessile, triangular-ovate to linear-lanceolate, apex acuminate. Distal stem leaves with undeveloped capitula in axil. Compound corymbs pyramidal, paniculate, 5–25 cm, to 14 cm wide, thyroid, proximal branches to 10 cm, each branch with corymbs; leaflike and supplementary bracts subulate, 1.5–7 mm; peduncles 3–10 mm. Capitula numerous (10–80). Involucre 8–12, in 2 rows, ovate or oblong, 2–5 mm wide, apex acute; cupular, 5–12 × 6–15 mm, outside convex, glabrous; phyllaries purplish white, as long as tubular corolla. Fl. and fr. Jul–Aug.

Wet grasslands, stream banks; 500–2000 m. Xinjiang [Kazakhstan, Kyrgyzstan, W Mongolia, SW Russia (Siberia)].


山地橐吾 shan di tuo wu

*Seneclis narynensis* (Candolle var. *kareliniana* (Trautvetter) O. Fedtschenko & B. Fedtschenko; *Seneclis narynensis* (C. Winkler) Kitamura; *Senecio robustus* (Candolle) Schultz Bipontinus var.* kareliniana* Trautvetter.

Stem erect, 9–70 cm tall, floccose-lanate, 2–6 mm in diam. at base, with a densely reddish brown lanate circle. Basal leaves petiolate; petiole 2–15 cm, floccose-lanate, base narrowly sheathed; leaf blade adaxially green, ovate-cordate, orbicular-cordate, triangular-cordate, or oblong-cordate, 1.4–15 × 1.6–10 cm, abaxially floccose-lanate, adaxially glabrous, pinnately veined, base cordate, margin undulate or sharply dentate, apex obtuse or acute, mucronate. Middle to distal stem leaves shortly petiolate or sessile, narrowly ovate to lanceolate. Distal stem leaves lanceolate, often with undeveloped capitula in axil. Capitula 1–15, in corymb or rarely solitary; leaflike and supplementary bracts linear-lanceolate, to 2.2 cm; peduncles 0.8–10 cm. Involucre hemispheric or cupular, 8–13 × 11–20 mm, outside glabrous; phyllaries (8–)10–15, in 2 rows, dark brown, lanceolate, oblong, or elliptic, 2–7 mm wide, apex acute or acuminate; inner phyllaries white membranous at margin. Ray florets 9–15, yellow; lamina oblong or broadly elliptic, 1.1–2.5 × 2–7 mm, apex acute or truncate; tube 3–4 mm. Tubular florets numerous, 8–9 mm, higher than involucre; tube ca. 3 mm. Achenes yellowish white or purplish brown, cylindrical, 4–7 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jun–Aug.

Grassy slopes, forest understories, alpine meadows; 600–3200 m. Xinjiang [E Kazakhstan, Kyrgyzstan].


昆仑山橐吾 kun lun shan tuo wu

Plants white floccose-lanate. Stem erect, to 70 cm tall, ca. 4 mm in diam. at base, with a densely reddish brown lanate circle. Basal and proximal stem leaves petiolate; petiole 10–15 cm, base narrowly sheathed; leaf blade oblong or elliptic, 4–12 × 2–7 cm, pinnately veined, base oblique, both sides laterally unequal, margin irregularly sparsely dentate, apex obtuse. Distal stem leaves sessile, bracteal, oblong, broadly lanceolate, or linear. Capitula 10, in corymb-raceme; supplementary bracts subulate; peduncles 6–12 cm. Involucre campanulate or cupular, 1–1.5 × 1.5–2 cm; phyllaries in 2 rows, linear-lanceolate, apex acuminate; inner phyllaries broadly white membranous at margin. Ray florets numerous, yellow; lamina obovate-oblong, 1.5–1.8 cm × ca. 4 mm, apex acute; tube ca. 4 mm. Tubular florets numerous, ca. 7 mm. Achenes cylindric, 3–3.5 mm. Pappus white, as long as tubular corolla. Fl. Jun.

● Subalpine meadows; 2400–2700 m. Xinjiang.


千花橐吾 qian hua tuo wu

Stem erect, to 100 cm tall, 1–1.5 cm in diam. at base, proximally glabrous, distally umbellate-branched, white arachnoid-puberulent. Basal leaves petiolate; petiole 35–40 cm, upper winged, base narrowly sheathed; leaf blade oblong, 22–25 × 12–18 cm, abaxially shortly pilose, adaxially glabrous, pinnately veined, base cuneate, margin regularly dentate, apex subrounded. Middle stem leaves similar but smaller, petiolate; sheath enlarged, 8–10 cm, cymbiform-amplexicaul. Distal stem leaves sessile, lanceolate. Capitula numerous, small, in large, compound corymbs to 40 cm, branches numerous, densely shortly brown pilose; leaflike and supplementary bracts lanceolate or linear; peduncles short, densely shortly brown pilose. Involucre turbinate, 4–6 mm, mouth ca. 5 mm in diam., outside densely shortly brown pilose, base acute; phyllaries 5, in 2 rows, ovate-oblong, ca. 2 mm wide, margin broadly brown membranous, apex acute. Florets 5, all tubular, wholly extending from involucre, 5–6 mm; tube 1.5–2 mm. Achenes dark brown, cylindric, 4–6 mm. Pappus yellowish, as long as tubular corolla. Fl. and fr. Jul–Aug.

● Grasslands, forest margins; 2600–4300 m. Xizang (Cona).

心叶橐吾 xin ye tuo wu

Stem erect, to 45 cm tall, 3–4 mm in diam. at base, densely shortyl yellowish pilose, distal hairs yellow. Basal leaves petiolate; petiole to 12 cm, slender, densely shortyl pilose; sheath 4–4.5 cm, densely shortyl pilose, mouth of sheath entire; leaf blade ovate-cordate or ovate, 4–9.5 cm, to 11.5 cm wide at base, abaxially sometimes shortyl pilose, adaxially glabrous, pinnately veined, base cordate, margin regularly denticulate, between teeth pubescent, apex obtuse; sinus 1/5–1/4 as long as leaf blade, basal lobes orbicular. Middle to distal stem leaves similar but smaller, shortly petiolate; sheath enlarged, cymbiform. Capitula 2–6, in corymb; leaflike bracts linear; supplementary bracts absent; peduncles 0.5–2 cm, densely shortly yellow pilose. Involucre broadly turbinate, 8–10 mm, mouth ca. 1 cm in diam., outside densely shortyl yellow pilose; phyllaries ca. 13, in 2 rows, oblong, ca. 3 mm wide, apex obtuse; inner phyllaries broadly brown membranous at margin. Florets numerous, higher than involucre, all tubular, yellow, 5.5–6.5 mm; tube 1–1.5 mm; limb cylindric. Achenes dark brown, fusiform, ca. 4 mm. Pappus yellowish, as long as tubular corolla. Fl. and fr. Sep.–Oct.

● Forest understories, grassy slopes; 3300–4000 m. S and SW Sichuan.


黑紫橐吾 he i zi tuo wu


Stem erect, 25–60 cm tall, 3–5 mm in diam. at base, densely long blackish purple pilose, intermixed white arachnoid-puberulent in synflorescence. Basal leaves petiolate; petiole 7–15 cm, densely long blackish purple pilose, base narrowly sheathing; leaf blade ovate-cordate, 5–9 × 3.5–7 cm, abaxially shortly pilose, densely so along veins, adaxially glabrescent, pinnately veined, lateral veins 6–10 pairs, abaxially with conspicuous slender reticulate veins, base cordate, margin minutely denticulate, long blackish purple pilose between teeth, apex obtuse; sinus 1/4–1/3 as long as blade, narrow, basal lobes oblong, convergent. Middle stem leaves often solitary, similar but smaller, shortly petiolate; sheath enlarged, 3–4 × ca. 1.5 cm, densely long blackish purple pilose. Capitula 4–10, in corymb; leaflike and supplementary bracts subulate, shorter; peduncles 3–15 mm, densely long blackish purple pilose. Involucre narrowly campanulate or turbinate, 6–10 mm, mouth to 1 cm in diam., outside long blackish purple pilose; phyllaries 10–12, in 2 rows; outer phyllaries lanceolate and narrow; inner phyllaries oblong and ca. 2.5 mm wide, margin narrowly brown membranous, apex acute. Florets numerous, all tubular, yellow, 6–7 mm; tube ca. 3 mm. Achenes pale brown, cylindrical, ca. 5 mm. Pappus yellowish, as long as tubular corolla. Fl. and fr. Aug.–Dec.

● Forest understories, grasslands; 3000–4000 m. SW Sichuan, NW Yunnan.


心叶橐吾 xin ye tuo wu

Stem erect, to 120 cm tall, 8–15 mm in diam. at base, proximally glabrous, distally and synflorescence initially shortly pilose and white arachnoid-puberulent, glabrescent. Basal leaves petiolate; petiole 7–25 cm, white arachnoid-puberulent, base sheathed; leaf blade ovate or ovate-oblong, 19–40.5 × 8.5–23 cm, both surfaces sparsely white arachnoid-puberulent or glabrescent, pinnately veined, midvein strong, to 1.2 cm wide, lateral veins spreading, base truncate or cuneate, margin regularly denticulate, between teeth ciliate, apex obtuse. Middle to distal stem leaves smaller distally, sessile, sheath amplexicaul; leaf blade ovate-oblong or ovate-lanceolate, to 20 × 9 cm. Compound corymb branched; branches to 23 cm, spreading or fasciated; leaflike and supplementary bracts smaller, linear-subulate; peduncles 0.5–4 cm. Capitula 6–23, rarely more (to 40). Involucre hemispheric or broadly campanulate, 1–1.2 × ca. 2 cm, outside white arachnoid-puberulent; phyllaries 8–14, in 2 rows, ovate-lanceolate or lanceolate, to ca. 7 mm wide, subleathery, apex acute, often curved; inner phyllaries broadly membranous at margin. Ray florets yellow; lamina linear-oblong, 1.5–2 cm × 3–4 mm, apex acute; tube ca. 7 mm. Tubular florets numerous, 1–1.1 cm; tube ca. 5 mm; limb narrowed at base. Achenes brown, cylindrical, 3–6 mm. Pappus reddish brown or yellowish, as long as tubular corolla. Fl. and fr. Jul–Oct.

● Forest understories, grassy slopes; 1800–3300 m. SW Sichuan, NW Yunnan.

舟叶橐吾 *zhou ye tuo wu*


Stem erect, 80–120 cm tall, to 2.5 cm in diam. at base, shortly pilose and white arachnoid-puberulent. Basal leaves petiolar; petiole ca. 15 cm, winged; wings to 4 cm wide, entire; leaf blade elliptic or ovate-oblong, rarely obovate, 15–60 × to 45 cm, pinnately veined, midvein strong, white arachnoid-puberulent, base shallowly cordate, margin minutely denticulate, apex rounded. Middle stem leaves sessile, cymbiform, to 20 cm, both surfaces white arachnoid-puberulent, sheath amplexicaul. Distalmost stem leaves sheathlike. Compound corymb much branched, to 40 cm, white arachnoid-puberulent and slightly pilose; leaflike and supplementary bracts smaller, linear; peduncles 2–15(–22) mm. Capitula numerous. Involucre campanulate, 8–10 mm, mouth to 1 cm in diam., outside dark green, base sparsely white arachnoid-puberulent; leaflike and supplementary bracts linear; peduncles 1.5–3 cm, shortly pilose. Capitula 1–20, in corymb or solitary; pappus pale brown, as long as tubular corolla. Fl. and fr. Jul–Aug.

● Forest margins, grassy slopes, alpine scrub, alpine meadows, stream banks; 2900–4800 m. SW and W Sichuan, S Xizang (Yadong), NW Yunnan.


舟曲橐吾 *zhou qu tuo wu*

Stem erect, 70–85 cm tall, 5–10 mm in diam. at base, distally white arachnoid-puberulent. Basal leaves obovate, small; sheath ca. 7 × 1 cm. Stem leaves 3 or 4, obovate to elliptic, 12–20 × 4.5–7.5 cm, white arachnoid-puberulent, pinnately veined, base cuneate, sheath amplexicaul, margin remotely dentate, apex rounded. Distal stem leaves smaller, elliptic to narrowly elliptic, base not amplexicaul, apex acuminate. Compound corymb paniculate, 23–28 cm, white arachnoid-puberulent and shortly brown pilose; leaflike bracts linear to linear-lanceolate, supplementary bracts 2 or 3, smaller, linear; peduncles 1.5–3 cm. Capitula numerous. Involucre turbinate, ca. 7 × 6 mm, outside dark green, base sparingly white arachnoid-puberulent; phyllaries 10–12, in 2 rows, linear or oblong-lanceolate, margin membranous, apex acute to acuminate. Outer florets female, 5–7, yellow, similar to tubular florets, limb 2–4-lobed to -divided, lobes 0.5–4 mm, unequal; tube 2–4 mm. Tubular florets 12–15, yellow, ca. 6 mm; tube ca. 2.5 mm. Achenes cylindric, with 7–10 ribs. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Aug.

● Alpine meadows; 2800–3600 m. SW Gansu.


广叶橐吾 *guang ye tuo wu*


Stem erect, to 100 cm tall, proximally glabrous, distally white arachnoid-puberulent. Basal leaves petiolar; petiole 30–40 cm, often winged, base sheathed; leaf blade ovate-lanceolate, ca. 20 × 15–20 cm, both surfaces shortly white pilose or abaxially intermixed arachnoid-puberulent, adaxially glabrous, pinnately veined, base hastate or cordate, rarely subtruncate, margin irregularly coarsely dentate, apex acuminate. Middle stem leaves petiolar; petiole winged; leaf blade cordate, 20–35 × ca. 9 cm, base sheathed, amplexicaul, margin sharply dentate. Capitula 12–15, in corymb; peduncles long, glabrous or arachnoid-puberulent; supplementary bracts 3–7, linear. Involucre campanulate, ca. 10 × 8 mm; phyllaries 8 or 9, in 2 rows, margin membranous, apex black. Ray florets yellow; lamina slightly longer than involucre, apex 3-denticulate. Tubular florets numerous. Achenes obovoid, ribbed. Pappus pale red. Fl. and fr. Aug.

● Grasslands; ca. 4300 m. Sichuan (Batang, Kangding, Litang).


东俄洛橐吾 *dong e luo tuo wu*


Stem erect, 20–100 cm tall, ca. 5 mm in diam. at base, white arachnoid-puberulent. Basal leaves petiolar; petiole 6–25 cm, shortly pilose, base sheathed; leaf blade ovate-cordate or ovate-oblong, 3–17 × 2.5–12 cm, shortly pilose, pinnately veined, base shallowly cordate, rarely subtruncate, margin dentate, apex obtuse. Middle to distal stem leaves similar but smaller, smaller distally, shortly petiolate; sheath enlarged, to 10 cm, shortly pilose. Capitula 1–20, in corymb or solitary; peduncles 1–7 cm, mouth to 1 cm in diam., outside white arachnoid-puberulent or glabrous; phyllaries 7–10, in 2 rows, ovate-lanceolate or lanceolate, margin brown membranous, apex acute. Ray florets yellow; lamina slightly longer than involucre, apex 3-denticulate. Tubular florets numerous. Achenes obvoid, ribbed. Fl. and fr. Jul–Aug.

● Forest margins, forest understories, wet valleys, scrub, alpine meadows; 2100–4000 m. SW and W Sichuan, SE Xizang, NW Yunnan.


合苞橐吾 *he bao tuo wu*

Plants grayish green. Stem erect, 50–200 cm tall, 2.5–7 mm in diam. at base, glabrous. Basal leaves petiolate; leaf blade broadly ovate or oblong, 10–30 × 5–22 cm, glabrous, pinnately veined, base rounded, margin irregularly undulate dentate, apex obtuse or acute. Middle to distal stem leaves shortly petiolate or sessile, oblong or ovate-oblong, to 13 × 4 cm, smaller distally. Synflorescence racemose, 6–13(–18) cm; peduncles 3–15 mm, slender. Capitula numerous. Involucre campanulate, 6–7 × ca. 5 mm, outside glabrous; phyllaries united, apex 2–5-dentate, tips of teeth acute or rounded. Ray florets 2–6, yellow; lamina oblong, 1.3–2.2 cm × 2–6 mm, apex acute; tube 4–5 mm. Tubular florets numerous, 7–10 mm; tube 2–3 mm. Achenes brown, cylindrical, 7–8 mm. Pappus reddish brown, as long as or shorter than tube of tubular corolla. Fl. and fr. Jun–Aug.

Swamp meadows, slopes, scrub, canopy gaps in forests; below 1500 m. N Hebei, NE Heilongjiang, NEI Mongol [Korea, Mongolia, Russia].

55. *Ligularia macrophylla* (Ledebour) Candolle, Prodr. 6: 316. 1838.

大叶橐吾 da ye tuo wu

*Cineraria macrophylla* Ledebour, Fl. Altaic. 4: 108. 1833; *Ligularia ledebourii* (Schultz Bipontinus) Bergman; *Senecills macrophylla* (Ledebour) Kitamura; *Senecio ledebourii* Schultz Bipontinus.

Plants grayish green. Stem erect, 35–110(–180) cm tall, 8–15 mm in diam. at base, proximally glabrous, distally and synflorescence shortly pilose. Basal leaves petiolate; petiole often purplish red, 5–20 cm, glabrous, narrowly winged, base sheathed; leaf blade ovate-oblong or oblong, 6–16(–45) × 4.5–9(–28) cm, glabrous, pinnately veined, base cuneate, narrowed into a petiole, margin undulate denticulate, apex obtuse. Stem leaves sessile, erect, ovate-oblong to lanceolate, to 12 × 5 cm, tubular-amplexicaul or semiamplexicaul at base. Synflorescence paniculate, 5–40 cm, proximally branched; leaflike and supplementary bracts linear-subulate, 3–8 mm; peduncles 1–3 mm, slender. Capitula numerous. Involucre narrowly campanulate or cylindric, 3.5–5(–6) × 2–3(–5) mm or mouth to 6 mm in diam., outside glabrous or white puberulent; phyllaries 4 or 5, in 2 rows, obovate or oblong, 1.5–3 mm wide, apex obtuse or rounded; inner phyllaries membranous at margin. Ray florets 1–3, yellow; lamina oblong, 6–8 × 2–3 mm, apex rounded; tube ca. 4 mm. Tubular florets 2–7, extending from involucre, 5–7 mm; tube 2–2.5 mm. Achenes yellowish, cylindric, 3–6 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jun–Aug. 2n = 58.

Stream banks, swamps, grasslands on shaded slopes, forest margins; 700–2900 m. Xinjiang (Altay, Tian Shan) [Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan].


异叶橐吾 yi ye tuo wu

Plants grayish green. Stem erect, 20–200 cm tall, 4–15 mm in diam. at base, proximally glabrous, distally and synflorescence white arachnoid-puberulent and shortly yellow pilose. Basal leaves petiolate; petiole 5–60 cm, glabrous, narrowly winged, base sheathed; leaf blade ovate-oblong or oblong, 5–45 × 5–35 cm, glabrous, pinnately veined, base cuneate, narrowed into a petiole, margin undulate denticulate, apex obtuse. Proximal stem leaves petiolate; petiole 4–8 cm, glabrous, broadly winged, base enlarged sheathed; leaf blade elliptic, oblong, or
or filiform, to 1 cm; peduncles 2–4 mm. Capitula numerous. In-
1–3(–7) cm; leaflike and supplementary bracts linear-subulate
at base. Synflorescence racemose-paniculate, ca. 30 cm, rarely
leaves to 17 × 8.5 cm, tubular-amplexicaul or semiamplexicaul
at base. Synflorescence racemose-paniculate, ca. 30 cm, rarely
proximally branches fewer and shorter, with a raceme; branches
1–3(–7) cm; leaflike and supplementary bracts linear-subulate
or filiform, to 1 cm; peduncles 2–4 mm. Capitula numerous. In-
volucral cupular or campanulate, 6–8 × 5–8 mm, outside gla-
broous or sparsely white puberulent; phyllaries 6–8(–10), in 2
rows, lanceolate or oblong, 2–3.5 mm wide, apex acute or acu-
minate; inner phyllaries membranous at margin. Ray florets (4
or)5–7, yellow; lamina narrowly oblong or oblong, 7–10 × 2–4
mm, apex acute or obtuse; tube ca. 3 mm. Tubular florets 10–
14(–16), slightly higher than involucre, 6–7 mm; tube ca. 2
mm. Achenes yellowish, cylindric, 4–7 mm. Pappus white, as
long as tubular corolla. Fl. Jul–Aug. 2n = 60.

Slopes, grasslands, stream banks, swamps; 2200–2500 m. Xin-
jiang (Tian Shan) [S Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan].


君范橐吾 jun fan tuo wu

Plants grayish green. Stem erect, to 120 cm tall, 3–4 mm
in diam. at base, glabrous. Basal leaves not seen. Middle stem
leaves sessile; leaf blade elliptic or oblong, 10–15 × 6–10.5 cm,
leathery, glabrous, pinnately veined, midvein strong, with con-
spicuous prominent reticulate veins on both surfaces, base cu-
neate, semiamplexicaul, margin undulate -shallowly dentate,
apex rounded. Distal stem leaves sessile, smaller, oblong, with
conspicuous reticulate veins, apex acute or acuminata. Synflo-
recence racemose, lax, to 15 cm; leaflike bracts reddish yellow
or yellowish brown when dry, ovate-oblong to lanceolate, 2–5 ×
1.5–2.5 cm, smaller distally, membranous, with conspicuous reti-
culate veins, apex acuminata; peduncles to 2 cm, often curved.
Capitula 6, nodding; supplementary bracts linear-lanceolate. In-
volute broadly campanulate, 1–2 × ca. 1 cm, base subtrun-
cate; phyllaries 8–10, in 2 rows, dark brown, lanceolate or ob-
long, apex acute; inner phyllaries broader, ca. 5 mm wide, mar-
ing membranous. Florets numerous, all tubular, yellow, 6–7
mm; tube ca. 2 mm. Achenes pale brown, oblong, 4.5–5.5 mm,
with 4 ribs. Pappus white, as long as tubular corolla. Fl. and fr.
Aug.

● Scrub, forest margins; ca. 3600 m. Sichuan (Muli).

58. Ligularia melanocephala (Franchet) Handel-Mazzetti, Bot.

黑苞橐吾 hei bao tuo wu

Senecio melanocephalus Franchet, Bull. Soc. Bot. France 39:
294. 1893; Senecillis melanocephala (Franchet) Kitamura.

Plants grayish green. Stem erect, to 100 cm tall, 6–8 cm
in diam. at base, proximally glabrous, distally and synflo-
recence shortly brown pilose. Basal leaves shortly petiolate; peti-
ole broadly winged, base enlarged sheathed; leaf blade oblong,

ovate, or broadly ovate, 14–28 × 9.5–11 cm, herbaceous, gla-
broous, pinnately veined, with prominent reticulate veins on both
surfaces, base cordate or broadly cuneate, narrowed into a peti-
ole, margin denticulate, apex obtuse. Middle to distal stem
leaves sessile, oblong to lanceolate, 14–27 × 8–10 cm, base
auriculate-amplexicaul, apex obtuse or acute. Synflorescence
racemose, 30–40 cm, lax; leaflike bracts linear, to 3.5 cm,
smaller distally; peduncles 5–30 mm. Capitula numerous; sup-
plementary bracts subulate. Involucre blackish gray, turbinate,
variably subcampanulate, 5–8 × ca. 5 mm, outside glabrous; phyl-
laries 7 or 8, in 2 rows, ovate-lanceolate or lanceolate, apex
acute or acuminate; inner phyllaries membranous at margin.
Ray florets 8–12, yellow; lamina oblong or elliptic, 4–8 × 2–3.5
mm, 2- or 3-dentate, apex rounded; tube ca. 2 mm. Tubular flo-
rets numerous, 5–6 mm, higher than involucre; tube 1.5–2 mm.
Achenes reddish brown, cylindric, to 7 mm, prominently ribbed.
Pappus yellowish white, as long as tubular corolla. Fl. and fr.
Aug.–Sep.

● Forest margins, forest understories, grassy slopes; 3400–4000
m. Sichuan (Daocheng, Muli), NW Yunnan.

59. Ligularia dictyoneura (Franchet) Handel-Mazzetti, Vege-
tationsbilder 22(Heft 8): 6. 1932.

网脉橐吾 wang mai tuo wu

Senecio dictyoneura Franchet, Bull. Soc. Bot. France 39:
294. 1893; Ligularia platyphylla Handel-Mazzetti; Senecillis
dictyoneura (Franchet) Kitamura.

Plants grayish green. Stem erect, purplish red, 33–124 cm
tall, 2.5–4 mm in diam. at base, solid, glabrous. Basal leaves
petiolate; petiole 8–22 cm, glabrous, below rounded, above
flat, middle to distal petioles narrowly winged; leaf blade ob-
long, ovate, or suborbicular, 8–30 × 5–21 cm, glabrous, pin-
nately veined, midvein robust, to 5 mm wide, with prominent
reticulate lateral veins on both surfaces, base cordate or slightly
subtruncate, margin dentate or subentire, apex rounded. Middle
to distal stem leaves sessile, obovate to ovate, 7–16 × 4–11
cm, base semiamplexicaul or tubular-amplexicaul, margin den-
tate, apex obtuse. Distalmost stem leaves sessile, ovate-lan-
ceolate to linear. Synflorescence racemose, to 30 cm, initially
densely clustered, elongating in fruit, lax; leaflike and supple-
mentary bracts linear, less than 1 cm; peduncles unequal, to 6.5
mm, densely shortly yellowish brown pilose. Capitula numer-
ous. Involucre turbinate or subcampanulate, 6–9 × 4–5 mm,
outside dark brown, glabrous; phyllaries 6–8, in 2 rows, oblong,
3–4 mm wide, brown ciliate, apex broadly triangular, acute, or
shortly mucronate; inner phyllaries broadly membranous at
margin. Ray florets 4–6, yellow; lamina oblong, 6–8(–20) × 3–
4 mm, apex rounded; tube ca. 3 mm. Tubular florets numerous,
5–6 mm, higher than involucre; tube 2.5–3 mm. Achenes dark
brown, cylindric, 3.5–5.5 mm. Pappus yellowish white, as
long as tubular corolla. Fl. Jun–Aug. 2n = 58*.

● Stream banks, forest understories, grassy slopes, scrub; 1900–
3600 m. SW Sichuan, Xizang, NW Yunnan.

69: 118. 1938.

芥形橐吾 jie xing tuo wu
Plants grayish green. Stem erect, 45–70 cm tall, ca. 7 mm in diam. at base, hollow, glabrous, except white arachnoid-puberulent in synflorescence. Basal leaves petiolate; petiole to 15 cm, glabrous, base sheathed, upper winged; leaf blade oblong or ovate, 17–30 × 6.5–17 cm, glabrous, pinnately veined, mid-vein robust, with white prominent reticulate veins on both surfaces, base cuneate, narrowed into a petiole, margin denticulate, apex obtuse. Middle to distal stem leaves sessile, oblong, to 14 × 4 cm, smaller distally, reticulate veins conspicuous, base semiamplexicaul or tubular-amplexicaul, apex obtuse. Synflorescence racemose, to 26 cm, initially densely clustered, elongating in fruit; leaflike bracts linear, shorter than peduncle, supplementary bracts subulate, shorter; peduncles 4–5 mm. Capitula numerous. Involucre shallowly campanulate, 6–8 × to 6 mm wide, outside shortly pilose; phyllaries 6–8, in 2 rows, black, ovate or oblong, rarely glabrous, apex triangular; inner phyllaries densely white ciliate and brown membranous at margin. Ray florets 4 or 5, yellow; lamina obovate or oblong, 7–10 × 3–4 mm, apex obtuse or acute; inner phyllaries membranous at margin. Tubular florets numerous, 6–7 mm; tube 2.4–3 mm. Achenes yellowish, cylindric, 4–5 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Aug.

● Grassy slopes; 2600–3100 m. SW and W Sichuan.

61. Ligularia altaica Candolle, Prodr. 6: 315. 1838.

阿勒泰橐吾 a le tai tuo wu

*Ligularia glauca* O. Hoffmann var. *altaica* (Candolle) Krylov; *Senecillis altaica* (Candolle) Kitamura; *Senecio altaicus* (Candolle) Schultz Bipontinus.

Plants grayish green. Stem erect, 10–150 cm tall, 4–10 mm in diam. at base, glabrous. Basal leaves petiolate; petiole 13–30 cm, glabrous, base narrowly sheathed, upper narrowly winged; leaf blade oblong, ovate-oblong, or elliptic, 8–50 × 3–35 cm, glabrous, pinnately veined, base cuneate, narrowed into a petiole, margin entire, apex obtuse or rounded. Stem leaves similar, but sessile, smaller distally, base semiamplexicaul, proximal bracts linear-subulate, less than 4 mm; peduncles to 1 cm. Capitula 5–17(–35). Involucre campanulate or subcupular, 6–10 × 5–7 mm, outside glabrous; phyllaries 7–9, in 2 rows, oblong or lanceolate, 1.5–3 mm wide, glabrous, apex acute or acuminate; inner phyllaries membranous at margin. Ray florets 4 or 5, yellow; lamina obovate or oblong, 6–7 × 3–4 mm, denticulate, apex rounded; tube ca. 4 mm. Tubular florets numerous (10–20), extending from involucre, ca. 7 mm; tube ca. 7 mm; limb narrowly cuneate. Achenes yellowish brown, cylindric, 4–7 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jun–Aug.

Grassy slopes, forest margins; 1100–3000 m. Xinjiang (Altay) [Kazakhstan, Mongolia, Russia (Siberia)].


帕米尔橐吾 pa mi er tuo wu

*Ligularia heterophylla* Ruprecht var. *alpina* Ruprecht; *L. heterophylla* var. *subramosa* Ruprecht.

Plants grayish green. Stem erect, 22–140 cm tall, 3–10 mm in diam. at base, glabrous except synflorescence shortly pilose. Basal leaves petiolate; petiole purplish red, 2.5–25 cm, glabrous, base sheathed, upper part narrowly winged; leaf blade oblong or broadly elliptic, 4.5–20 × 2.3–10.5 cm, glabrous, pinnately veined, abaxially with prominent veins, base cuneate, narrowed into a petiole, margin irregularly dentate, apex rounded or acute. Middle to distal stem leaves similar, but sessile, to 12 × 7 cm, smaller distally, base semiamplexicaul. Synflorescence racemose, rarely paniculate, 4–6(–15) cm, distal ones clustered, proximal ones branched, lax; branches 1.5–12 cm, each with 2–23 capitula; leaflike and supplementary bracts linear-subulate, 5–7 mm; peduncles 2–4 mm. Capitula numerous. Involucre campanulate or subcupular, 6–7 × 5–6 mm, outside densely shortly yellow pilose; phyllaries 6–8, in 2 rows, oblong or ovate, 3–5 mm wide, apex acute or obtuse; inner phyllaries membranous at margin. Ray florets yellow; lamina obovate or oblong, 7–10 × 3–4 mm, apex obtuse; tube ca. 4 mm. Tubular florets numerous, 6–7 mm; tube 2–2.5 mm. Achenes yellowish, cylindric, 4–5 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Aug. 2n = 58.

Alpine meadows, grassy slopes; 1900–4500 m. Xinjiang (Panir, Tian Shan) [NE Afghanistan, Kyrgyzstan, N Pakistan, Tajikistan, Uzbekistan].


长叶橐吾 chang ye tuo wu

*Ligularia ebracteata* Handel-Mazzetti; *L. semavensis* Handel-Mazzetti.

Stem erect, 83–200 cm tall, ca. 1 cm in diam. at base, proximally glabrous, distally white arachnoid-puberulent. Basal leaves petiolate; petiole to 57 cm, glabrous, base sheathed, upper part winged; leaf blade lanceolate, 14–37 × 6.5–9 cm, thick, glabrous, pinnately veined, base rounded or subtruncate, margin irregularly dentate, apex obtuse. Stem leaves fewer, sessile, oblong or lanceolate, to 7(–10) cm, smaller distally, semi-amplexicaul or sheath amplexicaul. Synflorescence racemose, 5–19 cm, distally or wholly (initially) densely clustered, proximally glabrous, distally white arachnoid-puberulent. Basal leaves petiolate; petiole purplish red, 2.5–25 cm, glabrous, base sheathed, upper part narrowly winged; leaf blade oblong or broadly elliptic, 4.5–20 × 2.3–10.5 cm, glabrous, pinnately veined, abaxially with prominent veins, base cuneate, narrowed into a petiole, margin irregularly dentate, apex rounded or acute. Middle to distal stem leaves similar, but sessile, to 12 × 7 cm, smaller distally, base semiamplexicaul. Synflorescence racemose, rarely paniculate, 4–6(–15) cm, distal ones clustered, proximal ones branched, lax; branches 1.5–12 cm, each with 2–23 capitula; leaflike and supplementary bracts linear-subulate, 5–7 mm; peduncles 2–4 mm. Capitula numerous. Involucre campanulate or subcupular, 6–7 × 5–6 mm, outside densely shortly yellow pilose; phyllaries 6–8, in 2 rows, oblong or ovate, 3–5 mm wide, apex acute or obtuse; inner phyllaries membranous at margin. Ray florets yellow; lamina obovate or oblong, 7–10 × 3–4 mm, apex obtuse; tube ca. 4 mm. Tubular florets numerous, 6–7 mm; tube 2–2.5 mm. Achenes yellowish, cylindric, 4–5 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Aug.

Grassy areas in swamps; 1900–3100 m. SW Sichuan, S to W Yunnan.


灰色橐吾 hui bao tuo wu

Plants grayish green. Stem erect, 35–45 cm tall, 2–4 mm in diam. at base, proximally glabrous, distally white arachnoid-puberulent and shortly yellowish brown pilose. Basal leaves petiolate; petiole 4–11 cm, winged; wings to 6 mm wide, mar-
gin entire, shortly ciliate; leaf blade ovate or ovate-oblong, rarely spatulate, 7–21.5 × 3–8 cm, thin, abaxially white pubescent along veins, adaxially glabrous, pinnately veined, base abruptly narrowed into a petiole, margin sparsely denticulate or dentate, apex obtuse or rounded. Middles to distal stem leaves sessile, oblong, 8–13 × to 5 cm, tubular-amplexical, margin denticulate, apex obtuse or acuminate. Distalmost stem leaves bracteal, ovate-lanceolate, 4–5 cm, apex acuminate. Synflorescence racemose, to 13 cm; leaflike bracts linear, to 1.5 cm; peduncles 2–4 mm. Capitula 6–17. Involucre turbinate, 7–9 mm, mouth to 9 mm in diam., outside glabrous; phyllaries 7 or 8, in 2 rows, blackish gray, oblong or lanceolate, submembranous, apex obtuse or acuminate. Florets numerous, all tubular, 4–8 × to 4.5 cm, base amplexical. Synflorescence racemose, to 15 cm, outside glabrescent; phyllaries 8–10, in 2 rows, oblong or narrowly lanceolate, apex obtuse to acute. Ray florets 6–10, yellow; lamina oblong, ca. 1 cm. Tubular florets numerous, 6–7 mm. Achenes yellowish, cylindric, to 4 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Nov.

● Alpine meadows; ca. 4700 m. SW Sichuan.


側茎橐吾 ce jing tuo wu


Plants grayish green. Stem erect, 40–100 cm tall, 2–9 mm in diam. at base, proximally glabrous, distally and synflorescence white arachnoid-puberulent. Basal leaves sessile; sheath often purplish red; leaf blade linear-oblong or broadly elliptic, 8–30 × 0.7–7 cm, glabrous, pinnate-parallel or parallel veined, base narrowed, margin entire, apex acute. Stem leaves sessile, smaller, elliptic to linear, base semiamplexicaul or not. Synflorescence racemose, to 20 cm, often lax; leaflike bracts lanceolate to linear, to 8 cm, sometimes longer than peduncle; peduncles 0.5–3(–10.5) cm. Capitula numerous, inclined to one side of racemose axis; supplementary bracts linear-subulate. Involucr turbinate, 5–14 × 5–15(–20) mm, outside glabrous, base acute; phyllaries 7–9, in 2 rows, ovate or lanceolate, 2–7 mm wide, apex acute; inner phyllaries membranous at margin. Ray florets yellow; lamina broadly elliptic or ovate-oblong, 7–14 × 3–6 mm, apex acute; tube ca. 2 mm. Tubular florets numerous, 5–6 mm; tube ca. 1 mm. Achenes brown, cuneate-cylindric, 2.5–3.5 mm, ribbed. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Nov.

● Slopes, stream banks, scrub, alpine meadows; 3000–4700 m. SW and W Sichuan, Xizang, NW Yunnan.


唐古特橐吾 tang gu te tuo wu


Plants grayish green. Stem erect, 40–100 cm tall, 2–9 mm in diam. at base, glabrous or distalmost shortly pilose. Basal leaves petiolate; petiole 3–15 cm, proximally purplish red, distinctly broadly winged; leaf blade broadly ovate or elliptic, 6–21 × 3–13 cm, glabrous, pinnately veined, abaxially with strong midvein, base subtruncate or broadly cuneate, abruptly narrowed into a broadly winged petiole or only distally winged, margin denticulate or coarsely undulate-dentate, apex acute. Middles to distal stem leaves erect, elliptic or oblong, 4–8 × to 4.5 cm, base amplexical. Synflorescence racemose, to 15 cm, outside glabrescent; phyllaries 8–10, in 2 rows, oblong or narrowly lanceolate, apex obtuse to acute. Ray florets 6–10, yellow; lamina oblong, ca. 1 cm. Tubular florets numerous, 6–7 mm. Achenes yellowish, cylindric, to 4 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Aug. 2n = 58*.

● Shaded slopes, scrub, forest understories; 2700–4000 m. NW Gansu, Qinghai, Sichuan.


黄帚橐吾 huang zhou tuo wu

Plants grayish green. Stem erect, 15–80 cm tall, 2–9 mm in diam. at base, glabrous. Basal leaves petiolate; petiole to 21.5 cm, winged or only upper winged; wings entire or dentate, or broadly or narrow, glabrous; sheath often purplish red; leaf blade ovate, elliptic, or oblong-lanceolate, 3–15 × 1.3–11 cm, glabrous, pinnately or sometimes subparallel veined, base cuneate, gradually attenuate, margin entire, sometimes revolute, apex obtuse or acute. Stem leaves sessile, smaller, ovate or ovate-lanceolate to linear, longer than internodes, rarely distally shorter, often tubular-amplexicaul, apex acute to acuminata. Synflorescence racemose, 4.5–22 cm, clustered or distally clustered, proximally lax; leaflike bracts linear-lanceolate to linear, to 6 cm, smaller distally; peduncles 3–10(–20) mm, white arachnoid-puberulent. Capitula numerous, sometimes solitary or few; supplementary bracts filiform. Involucrurc turbinate or cupular, 7–10 × 6–9 mm, rarely wider, in solitary capitulum, outside glabrous or densely pilose; phyllaries 10–14, in 2 rows, oblong or narrowly lanceolate, 1.5–5 mm wide, attenuate to caudate, margin broadly or narrowly membranous, apex obtuse to acuminate. Ray florets 5–14, yellow; lamina linear, 8–22 × 1.5–2.5 mm, apex acute; tube ca. 4 mm. Tubular florets numerous, 7–8 mm; tube ca. 3 mm; limb cuneate. Achenes yellowish, cylindric, 3.5–5 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Aug. 2n = 58, 87.

Slopes, stream banks, scrub, swamp meadows, alpine meadows; 2400–4700 m. Gansu, Qinghai, Sichuan, E and NE Xizang, NW Yunnan [Bhutan, India (Sikkim, Nepal)].

1a. Capitula solitary or few, in lax raceme .............................................. 67c. var. oligosepala
1b. Capitula numerous, in dense raceme.

2a. Involucrurc glabrous .................................. 67a. var. virgaurea
2b. Involucrurc outside densely shortly yellow pilose ............................. 67b. var. pilosa

67a. Ligularia virgaurea var. virgaurea

黄帚橐吾(原变种) huang zhou tuo wu (yuan bian zhong)

Saint-Pétersbourg 27: 484. 1882; Cremanthodium plantaginifolium (Franchet) R. D. Good; C. plantaginifolium subsp. franchetti R. D. Good; C. plantaginifolium f. lagotis (W. W. Smith) R. D. Good; C. virgaurea (Maximowicz) Handel-Mazzetti; Ligularia plantaginifolia (Franchet) Mattfeld; Senecillis virgaurea (Maximowicz) Kitamura; Senecio lagotis W. W. Smith; S. plantaginifolius Franchet.

Involucre outside glabrous.

Shaded slopes, stream banks, scrub, swamp meadows, alpine meadows; 2400–4700 m. Gansu, Qinghai, Sichuan, NE Xizang, NW Yunnan [Bhutan, India (Sikkim), Nepal].


毛黄帚橐吾 mao huang zhou tuo wu

Involucre outside densely shortly yellow pilose.

- Grassy slopes; 3800–4500 m. Sichuan (Garzê), E Xizang.


疏序黄帚橐吾 shu xu huang zhou tuo wu


Plants dwarf. Capitula usually solitary or few, in lax raceme.

- Grassy slopes; 3200–4500 m. SW Gansu, Qinghai.


缘毛橐吾 yuan mao tuo wu

Plants grayish green. Stem erect, to 100 cm tall, 5–8 mm in diam. at base, proximally glabrous, distally and synflorescence white arachnoid-puberulent. Basal leaves petiolate; petiole to 5 cm, glabrous, entirely winged, base sheathed; leaf blade oblong or obovate-lanceolate, rarely elliptic, 8–22 × 4.5–8 cm, glabrous, or initially white pubescent along veins, or puberulent and sometimes shortly yellowish brown pilose, pinnately veined, abaxially with prominent reticulate veins, base cuneate, narrowed into a winged petiole, margin dentate, apex obtuse or acute. Middle to distal stem leaves sessile, obovate-lanceolate to linear, smaller distally, base semimargazic, margin entire or denticulate, apex acuminate. Synflorescence racemose, to 40 cm, clustered; leaflike bracts linear-lanceolate to linear, proximally to 4.5 cm, smaller distally; peduncles 3–7 mm. Capitula numerous; supplementary bracts subulate. Involucre turbinate, 7–10 × ca. 5 mm, outside white pubescent or glabrescent, or puberulent and sometimes shortly yellowish brown pilose; phyllaries 7 or 8, in 2 rows, oblong or lanceolate, ca. 3 mm wide, margin membranous and densely white ciliate, apex acuminate. Ray florets 5 or 6, yellow; lamina linear, 6–8 × 1–1.5 mm, apex obtuse; tube ca. 4 mm. Tubular florets numerous, ca. 7 mm; tube ca. 3 mm. Achenes yellowish, cylindrical, 3–5 mm, with prominent ribs. Pappus white, as long as tubular corolla. Fl. and fr. Jul.–Aug. 2n = 58*.

- Stream banks, swamps, scrub-covered meadows, alpine meadows; 2900–4500 m. SW Qinghai, Sichuan, NE Xizang.

1a. Leaves and involucre initially white pubescent ............................................... 68a. var. liatroides

1b. Leaves and involucre white pubescent and shortly yellowish brown pilose ............................................... 68b. var. shifangensis

68a. Ligularia liatroides var. liatroides

缘毛橐吾 (原变种) yuan mao tuo wu (yuan bian zhong)


Leaves and involucre white pubescent.

- Stream banks, swamps, scrub-covered meadows, alpine meadows; 2900–4500 m. SW Qinghai, N, SW, and W Sichuan, NE Xizang.


什邡缘毛橐吾 shi fang yuan mao tuo wu


Leaves and involucre white pubescent and shortly yellowish brown pilose.

- 3200–3700 m. Sichuan (Pengxian, Shifang).


毛茎橐吾 mao jing tuo wu

Plants grayish green. Stem erect, 30–55 cm tall, 4–6 mm in diam. at base, proximally glabrescent, distally and synflorescence densely white arachnoid-puberulent and shortly yellowish brown pilose. Basal leaves petiolate; petiole 2–16 cm, glabrous or sparsely arachnoid-puberulent, base sheathed, entirely winged at middle to distally; leaf blade obovate-oblong or oblanceolate, 8–28 × 3–6 cm, sparsely white puberulent and shortly yellowish brown pilose on both surfaces or adaxially more densely so, pinnate-parallel veined, base cuneate, margin denticulate, apex acute. Stem leaves 1–3, sessile, tubular, 2.5–7 cm, margin entire or irregularly denticulate. Synflorescence racemose, 5–15 cm, lax; leaflike bracts linear-lanceolate to linear, proximal ones to 3.5 cm, densely arachnoid-puberulent, smaller distally. Capitula 2–10; supplementary bracts linear to subulate, shorter than involucre, arachnoid-puberulent. Involucre broadly campanulate, 8–13 mm, mouth 7–16 mm in diam., outside white puberulent or shortly yellowish brown pilose; phyllaries 10–12, in 2 rows, lanceolate or obovate-lanceolate, 1.5–4 mm wide, margin membranous and sparsely white ciliate, apex acuminate, acute, or rounded. Ray florets 10 or 11, yellow; lamina oblong, 9–13 × 2–3.5 mm, apex acute or rounded; tube 1.5–2.5 mm. Tubular florets numerous, 4–5 mm; tube 1–1.5 × ca. 3 mm. Achenes oblanceolate (immature). Pappus white, as long as tubular corolla. Fl. Aug, fr. Aug–Sep.


Stem scapelike, erect, 15–63 cm tall, sparsely white puberulent, 4–5 mm in diam. at base, with a densely long white lanate circle. Leaves all basal, petiolate; petiole to 23 cm, base white lanate sheathed, distally narrowly winged; leaf blade ovate-oblong, 19–23 × 12–18 cm, glabrescent, pinnately veined, base coriaceous or rarely truncate, margin undulate dentate, apex obtuse, mucronate. Scape with a linear bracteal leaf. Synflorescence panicle-racemose, to 50 cm, densely white lanate; leaflike and supplementary bracts longer, to 3.5 cm, narrower, white lanate; peduncles slender, proximal ones with 7 capitula. Capitulum numerous. Involucre narrowly campanulate, 6–8 × ca. 5 mm, outside white puberulent; phyllaries 7 or 8, in 2 rows, oblong, 1.5–3 mm wide, apex triangular, obtuse; inner phyllaries brown membranous at margin. Ray florets yellow; lamina oblong, 10–12 × 8–10 mm; tube ca. 1/4 as long as limb. Pappus white, as long as tubular corolla. Fl. Jul, fr. Aug.

- Wet scrub; 3200–4300 m. SW Sichuan.


Stem scapelike, erect, 15–63 cm tall, sparsely white puberulent, 4–5 mm in diam. at base, with a densely long white lanate circle. Leaves all basal, petiolate; petiole to 23 cm, base white lanate sheathed, distally narrowly winged; leaf blade ovate, elliptic, or suborbicular, 2.5–15 × 3.5–12 cm, abaxially white lanate, adaxially glabrous, pinnately veined, lateral veins 12 pairs, base shallowly cordate, truncate, or cuneate, margin regularly denticulate, apex acute. Scape without bracteal leaf. Synflorescence racemose, 4.5–15 cm, clustered or lax, to 3.5 cm, narrower, white lanate; peduncles slender, proximal ones to 5.5 cm × ca. 1 mm, smaller distally; peduncles unequal, proximally to 5 cm, with 5 capitula, distal ones with 1 capitulum. Capitulum numerous, nodding; supplementary bracts linear. Involucre campanulate or turbinate, 8–10 × 5–7 mm, outside blackish gray, white arachnoid-puberulent; phyllaries 7 or 8, in 2 rows, oblong or lanceolate, apex acute, pappus white, as long as tubular corolla. Fl. and fr. Jun–Sep. 2n = 58*.

- Stream banks, forest understories, grassy slopes; 2100–4600 m. SW Sichuan, NW Yunnan.


- Stream banks, forest understories, alpine meadows; 3500–4000 m. Gansu (Têwo), Qinghai (Yushu), Sichuan (Jiulong, Muli), Yunnan (Zhongdian).


- Stream banks, forest understories, alpine meadows; 3500–4000 m. Gansu (Têwo), Qinghai (Yushu), Sichuan (Jiulong, Muli), Yunnan (Zhongdian).


- Stream banks, forest understories, grassy slopes; 2100–4600 m. SW Sichuan, NW Yunnan.


- Stream banks, forest understories, alpine meadows; 3500–4000 m. Gansu (Têwo), Qinghai (Yushu), Sichuan (Jiulong, Muli), Yunnan (Zhongdian).


- Stream banks, forest understories, grassy slopes; 2100–4600 m. SW Sichuan, NW Yunnan.

复序橐吾  fu xu tuo wu

Ligularia deltoidea Nakai; L. jaluensis var. ruminicollia Komarov; L. leucocoma Nakai; L. pulchra Nakai; Senecilis jalaeana (Komarov) Kitamura.

Stem erect, to 200 cm tall, ca. 1 cm in diam. at base, proximally glabrous, distally shortly pilose and white arachnoid-puberulent. Basal leaves petiolate; petiole to 40 cm, shortly pilose, narrowly, entire, very winged, base sheathed; leaf blade triangular or ovate-triangular, 8–37 × 7–35 cm, abaxially shortly pilose only on veins, adaxially glabrous, pinnately veined, midvein robust, lateral and reticulate veins abaxially prominent, base cordate or subtruncate, margin shallowly triangular-dentate and ciliate, apex acute. Middle to distal stem leaves smaller, shortly petiolate; petiole winged, base sheathed; leaf blade triangular or oblong. Synflorescence paniculate-racemose or racemose, to 50 cm, bracted, lower branches to 22 cm; leaflike bracts linear, ca. 5 mm; peduncles 1–1.5 cm, shortly pilose. Capitula numerous; supplementary bracts subulate or absent. Involucre campanulate or cupular, 1–1.1 cm × 8–15 mm, glabrous; phyllaries 8–12, in 2 rows, oblong, 3–4 mm wide, apex acute; inner phyllaries membranous at margin. Ray florets 5–8, yellow; lamina elliptic, 1.3–1.8 cm, to 6.5 mm wide, apex acute; tube ca. 5 mm. Tubular florets numerous, 8–9 mm; tube 2–2.5 mm. Achenes yellowish, cylindric, 4–6 mm. Pappus white, as long as tubular corolla. Fl. Jul.–Sep.


裸柱橐吾  luo zhu tuo wu

Stem erect, ca. 30 cm tall, robust, hollow, sparsely arachnoid-pubescent. Petiole as long as leaf blade, unwinged, base sheathed; leaf blade dark green, ovate-cordate, ca. 16 × 12 cm, abaxially shortly brown pilose, adaxially sparsely pubescent, pinnately veined, abaxially with tenuous prominent reticulate veins, margin dentate, apex acute, or rounded in narrow basal leaves. Distal stem leaves smaller, transversely elliptic, margin dentate, apex entirely long caudate-mucronate. Synflorescence initially racemose, clustered, ca. 8 cm, pubescent; leaflike bracts linear; peduncles ca. 2 mm. Capitula numerous; supplementary bracts filiform. Involucre campanulate, ca. 8 mm, outside and margin shortly pilose; phyllaries 5, in 2 rows, oblong-lanceolate, apex acute; inner phyllaries membranous at margin. Outer florets female, 1 or 2, corolla absent; style naked. Tubular florets 5. Pappus white, shorter than tubular corolla. Fl. Jul., fr. Aug.

- Scrub; ca. 3600 m. SE Xizang (Nangxian).


洱源橐吾  er yuan tuo wu


Stem erect, ca. 50 cm tall, ca. 6 mm in diam. at base, densely white arachnoid-puberulent. Basal leaves petiolate; petiole to 23 cm, white arachnoid-puberulent, base sheathed; leaf blade triangular or ovate, 19.5–24 × ca. 16 cm, abaxially grayish white arachnoid-puberulent, adaxially glabrous, pinnately veined, base subtruncate, margin regularly denticulate, apex obtuse. Proximal stem leaves scallike, ovate, ca. 3 cm, middle to distally grayish white puberulent. Middle stem leaves sessile, similar but smaller. Distalmost stem leaves scallike or ovate-lanceolate, including petiole to 8 cm, base cuneate, narrowed into a broadly winged petiole, margin minutely denticulate, apex caudate-acuminate. Synflorescence racemose, 9–25 cm, clustered or lax, proximal capitula often undeveloped; leaflike and supplementary bracts linear; peduncles ca. 1 cm, white puberulent. Capitula numerous. Involucre broadly and shallowly campanulate, 7–12 mm, mouth to 1.2 cm in diam., outside grayish white puberulent; phyllaries 8 or 9, in 2 rows, linear-oblong, ca. 2 mm wide. Ray florets 7, yellow; lamina oblong, 10–13 × 3–5 mm, apex obtuse; tube ca. 3 mm. Tubular florets numerous, ca. 7 mm; tube ca. 2 mm; limb narrow, base cuneate. Achenes yellowish, cylindric, 4.5–6 mm. Pappus white, as long as tubular corolla. Fl. Jul. and fr. Apr.–Sep.

- Slopes, scrub, forest understories; 2100–3800 m. SW Sichuan, NE to NW Yunnan.

林芝橐吾 *lin zhi tuo wu*

STEM erect, to 100 cm tall, ca. 1 cm in diam. at base, white pubescent. Rosette of leaves not seen. Proximal stem leaves petiolate; petiole 5.5–10 cm, narrowly winged, base sheathed; leaf blade ovate-cordate, 13–16.5 × 11–13 cm, abaxially grayish white pubescent, adaxially glabrous, pinnately veined, base cordate, margin regularly obtusely crenate, apex rounded. Distal stem leaves sessile or shortly petiolate, ovate to narrowly ovate, to 7 × 4 cm, apex ciliate-acuminate. Synflorescence racemose, to 24 cm; leaflike and supplementary bracts linear, to 2 cm; peduncles 5–8 mm, shortly white pilose. Capitula numerous. Involucre narrowly campanulate, 5–6 × 6–8 mm, outside white pubescent; phyllaries ca. 8, in 2 rows, black, oblong or lanceolate, 2–3 cm wide, apex acute or acuminate. Florets all tubular; outer florets female, 1–3(或4), narrowly cylindric, shorter than central florets, 4–5 mm, corolla deeply 2-divided, labiate, one of lobes sometimes shorter or 2-divided. Central florets numerous, yellow, higher than involucre, ca. 6 mm; tube ca. 2 mm. Pappus pale yellow, as long as tubular corolla. Fl. Jun–Jul, fr. Jul–Aug.

- Alpine meadows; ca. 4400 m. Xizang (Nyingchi), Yunnan (Lijiang).


宽翅橐吾 *kuan zhi tou wu*

STEM erect, ca. 62 cm tall, ca. 6 mm in diam. at base, shortly pale yellow pilose. Basal leaves petiolate; petiole 22–26 cm, distal part mostly winged; wings 4.5–5 cm wide, base enlarged sheathed, margin regularly triangularly dentate; leaf blade ovate-cordate, 13–15 × 14–16 cm, glabrous, pinnately veined, base cordate, margin densely dentate, apex acute. Middle to distal stem leaves similar but smaller. Synflorescence racemose, ca. 13 cm; leaflike bracts lanceolate, 2–2.5 cm × 2–3.2 mm; peduncles ca. 1 cm. Capitula numerous; supplementary bracts short. Involucre broadly campanulate, ca. 1 cm, outside shortly pilose; phyllaries ca. 8, in 2 rows, apex acute; outer phyllaries linear, 2–2.5 mm wide; inner phyllaries 3–4 mm wide, margin broadly membranous. Ray florets ca. 8, yellow; lamina ca. 28 × 5 mm, apex obtuse; tube ca. 5 mm. Tubular florets numerous, ca. 10.5 mm; tube ca. 4.5 mm; limb campanulate, ca. 2.5 mm wide. Achenes oblong, ca. 4.5 mm. Pappus reddish brown, ca. 4 mm, as long as tube of tubular corolla. Fl. and fr. Sep.

- Margins of scrub; ca. 4000 m. Xizang (Zayü).


阎柄橐吾 *kuo bing tou wu*

STEM erect, to 70 cm tall, 5–8 mm in diam. at base, proximally glabrous, distally and synflorescence purplish red, shortly blackish purple pilose. Basal leaves petiolate; petiole 4–8 cm, winged; wings to 2 cm wide, margin entire or dentate; base enlarged sheathed; sheath to 11 × 4 cm, glabrous, margin entire or dentate; leaf blade cordate or ovate-cordate, 3.5–15 × 5.5–11 cm, pinnately veined, base cordate, margin sinuate-dentate, apex rounded; basal lobes orbicular. Middle stem leaves smaller, shortly petiolate, enlarged sheathed; leaf blade ovate. Synflorescence paniculate-racemose, to 10 cm, lax, proximal branches with 3 or 4 capitula; leaflike bracts linear, shorter; peduncles to 1.5 cm. Capitula numerous; supplementary bracts subulate, shorter than involucre. Involucrre narrowly campanulate or cylindric, 6–8 × 4–5 mm, outside purplish red, glabrous; phyllaries 5–8, in 2 rows, oblong, white ciliate, margin membranous and pale colored, apex obtuse, triangular. Ray florets yellow, not seen. Tubular florets 10–15, 8–9 mm, tube slightly longer than broadly campanulate limb. Achenes dark brown, narrowly oblancoate, 5–6 mm, attenuate at apex. Pappus rufous, 6–7 mm, slightly shorter than tubular corolla. Fl. and fr. Aug–Sep.

- Grassy slopes; ca. 2600 m. Sichuan.


翅柄橐吾 *chi bing tou wu*

STEM erect, to 150 cm tall, 1–1.5 cm in diam. at base, proximally glabrous, distally white arachnoid-puberulent and yellow pilose. Basal leaves petiolate; petiole to 32.5 cm, winged; wings to 5 mm wide; base sheathed, margin entire; leaf blade ovate-cordate, 7–40 cm, proximally 10–17 cm wide, glabrous or abaxially pubescent along veins, pinnately veined, base cordate, margin regularly denticulate, ciliate, apex obtuse; sinus broad and shallow, ca. 1/10 as long as leaf blade, basal lobes orbicular. Middle stem leaves similar, but shortly petiolate; petiole winged; wings denticulate; sheath to 10 cm, upper margin dentate. Distalmost stem leaves bracteal, with enlarged sheathed petiole; leaf blade ovate or reniform, to 6 × 7 cm, margin dentate; pinnately or palmate-pinnately veined. Synflorescence racemose, to 35 cm; leaflike bracts ovate-lanceolate, proximal ones to 7.5 × 2.5 cm, smaller distally, dentate or reniform with sheathed petiole; peduncles slender, proximally to 11 cm, shorter distally, white arachnoid-puberulent. Capitula numerous; supplementary bracts narrowly lanceolate, 1–1.5 cm, longer than involucre, entire or dentate. Involucrre broadly campanulate, 8–11 × ca. 10 mm, outside glabrous or white arachnoid-puberulent; phyllaries 10 or 11, in 2 rows, oblong, 4–5 mm wide, margin broadly brown membranous, apex broadly triangular. Ray florets yellow; lamina linear, 30–40 × 2–3 mm, apex acute; tube ca. 5 mm. Tubular florets numerous, ca. 8 mm; tube ca. 4 mm; limb broadly campanulate. Pappus white, as long as tubular corolla. Fl. Jul–Aug.

- Grassy slopes; 2700–3600 m. SW Sichuan, NW Yunnan.


总状橐吾 *zong zhuang tuo wu*


STEM erect, to 70 cm tall, 3–4 mm in diam. at base, proximally glabrous, distally and synflorescence white arachnoid-puberulent. Basal leaves petiolate; petiole to 25 cm, base sheathed,
proximally glabrous, distally narrowly winged, white arachnoid-puberulent; leaf blade ovate-cordate, triangular-cordate, or suborbicular, 2.5–12 × 4–15 cm, thin, glabrous, pinnately veined, base shallowly cordate or cordate, margin regularly denticulate, apex rounded or acute; basal lobes triangular. Middle stem leaves shortly petiolate, base enlarged sheathed; leaf blade cordate or ovate-cordate, 2–7 × 4–7 cm. Distalmost stem leaves sessile, lanceolate. Synflorescence racemose, 12–26 cm, lax; leaflike bracts ovate, to 25 × ca. 8 mm, smaller distally, membranous, with prominent reticulate veins on both surfaces, margin denticulate, apex acuminated; peduncles 5–8 mm, slender, white arachnoid-puberulent. Capitula numerous; supplementary bracts narrowly ovate or lanceolate, as long as involucral, membranous, margin denticulate or entire. Involute campanulate, 6–8 × 5–6 mm, outside white arachnoid-puberulent; phyllaries 7–9, in 2 rows, oblong, 2–3 mm wide, brown ciliate, apex triangular; inner phyllaries broadly membranous at margin. Ray florets 5 or 6, yellow; lamina oblong, 2–3 × ca. 1 mm; tube ca. 4 mm, slender. Tubular florets numerous, 7–8 mm; tube 2–3 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Sep. 2n = 58.

Grassy slopes, forest understories; 3100–4000 m. SW Gansu, Shaanxi, N and NW Sichuan [Nepal].


**箭叶橐吾** jian ye tuo wu


Stem erect, 25–70 cm tall, to 1 cm in diam. at base, glabrous or distally and synflorescence initially white arachnoid-puberulent, glabrescent. Basal leaves petiolate; petiole 4–8 cm, white arachnoid-puberulent, narrowly winged, wing margin entire or denticulate, base sheathed; leaf blade sagittate, hastate, or ovate-oblong to oblong-sagittate, 2–20 cm, 1.5–20 cm wide at base, abaxially white arachnoid-puberulent or glabrescent, adaxially glabrous, pinnately veined, margin dentate, apex obtuse or acute; sinus 1/4–1/3 as long as leaf blade, broad, basal lobes divergent or not, outer margin coarsely dentate. Middle stem leaves shortly petiolate, sheath amplexicaul; leaf blade smaller, sagittate or ovate. Distalmost stem leaves bracteal, lanceolate to narrowly lanceolate. Synflorescence racemose, 6.5–40 cm, lax; leaflike bracts ovate-lanceolate or narrowly lanceolate to linear, 6–15 × ca. 7 mm or rarely longer and wider, to 6.5 cm, herbaceous, apex acuminated; peduncles 5–70 mm, slender. Capitula numerous; supplementary bracts linear. Involute campanulate or narrowly campanulate, 7–10 × 4–8 mm, outside glabrous; phyllaries 7–10, in 2 rows, oblong or lanceolate, apex acute or acuminate; inner phyllaries membranous at margin. Ray florets 5–9, yellow; lamina oblong, 5–12 × ca. 3 mm, apex obtuse; tube ca. 5 mm. Tubular florets numerous, 7–8 mm; limb extending from involucre; tube 3–4 mm. Achenes brown, cylindric, 3.5–6 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Sep. 2n = 58.

Stream banks, grassy slopes, forest understories; scrub; 1300–4000 m. Gansu, Hebei, Helongjiang, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan [E Himalaya (Gyong), Mongolia].


**宽舌橐吾** kuan she tuo wu


Stem erect, 30–100 cm tall, 5–8 mm in diam. at base, proximally glabrous, distally white arachnoid-puberulent and shortly pilose. Basal leaves petiolate; petiole 10–30 cm, narrowly, entirely winged, base sheathed; leaf blade ovate or ovate-cordate, 11–40 × 6–20 cm, glabrous, pinnately veined, base shallowly cordate, truncate, or broadly cuneate, margin undulate-dentate, apex obtuse. Stem leaves sessile, without sheath, erect, ovate-oblong or ovate-lanceolate, 2–16 cm, smaller distally, margin dentate, apex acute. Synflorescence racemose, 15–50 cm, proximally sometimes shortly branched; leaflike bracts narrowly lanceolate or linear to filiform, to 5.5 cm; peduncles 4–30 mm, shortly pilose. Capitula numerous; supplementary bracts linear. Involute broadly turbinate, 7–10 mm, mouth to 1.5 cm in diam., outside glabrous; phyllaries 8–11, in 2 rows, ovate-lanceolate to narrowly lanceolate, 1.5–4(–5) mm, apex acute; inner phyllaries broadly membranous at margin. Ray florets yellow; lamina oblong, 1–2 cm × 2–4.5 mm, apex acute; tube ca. 5 mm. Tubular florets numerous, 6–8 mm; tube ca. 2 mm. Achenes brown, cylindric, 4–6 mm. Pappus reddish brown or yellowish white initially, slightly shorter than tubular corolla. Fl. and fr. Jul–Nov.

● Stream banks, grassy slopes, forest understories; 1200–3800 m. NE and NW Yunnan.


**干崖子橐吾** gan ya zi tuo wu

Stem erect, 30–160 cm tall, 4–15 mm in diam. at base, proximally glabrous, distally white arachnoid-puberulent. Basal leaves petiolate; petiole 9–30 cm, glabrous, narrowly winged, gradually enlarged toward base into a sheath; sheath 7–11 cm, to 2 cm wide, oppositely amplexicaul, mouth of sheath spreading toward outside, forming an oblique petiole; leaf blade ovate-oblong or ovate-triangular, 4–25 × 3–20 cm, glabrous, pinnately veined, base shallowly cordate or truncate, margin regularly dentate, apex acute. Stem leaves sessile, erect, adnate, ovate-lanceolate, to 9 cm, smaller distally, tubular-amplexicaul. Synflorescence racemose, 15–40 cm; leaflike bracts narrowly lanceolate or rhombic, 2–3.3 cm × 3–4 mm, subentire or dentate, narrowed at base; peduncles 5–20 mm, smaller distally. Capitula numerous; supplementary bracts linear-lanceolate, 8–12 mm. Involute campanulate, 8–10 × 5–8 mm, outside glabrous; phyllaries 8, in 2 rows, oblong, 2–3 mm wide, apex acute
or obtuse; inner phyllaries broadly membranous at margin. Ray florets 5–7, yellow; lamina oblong or obovate-oblong, 1.4–1.8 cm × 3–4.5 mm, apex obtuse; tube ca. 4 mm. Tubular florets numerous, 7–8 mm; tube ca. 3 mm. Achenes brown, cylindric, ca. 5 mm. Pappus yellow, as long as tubular corolla. Fl. and fr. Jul–Oct. 2n = 58*.

- Grassy slopes, swamps, scrub, grasslands in valleys; 2400–4300 m. N Sichuan, NW and W Yunnan.

1a. Leaflike bract narrowly lanceolate, sessile, margin entire. 85a. var. kanaitzensis

1b. Leaflike bract rhombic, shortly petiolate, margin dentate. 85b. var. subnudicaulis

85a. Ligularia kanaitzensis var. kanaitzensis

丽江橐吾(原变种) gan ya zi tuo wu (yuan bian zhong)


Leaflike bracts sessile, narrowly lanceolate, margin entire.

- Grassy slopes, swamps, scrub; 2400–4300 m. SW Sichuan (Muli), W Yunnan.

85b. Ligularia kanaitzensis var. subnudicaulis (Handel-Mazzetti) W. W. Smith.

- Grassy slopes, swamps, scrub; 2400–3700 m. NW Yunnan.


丽江橐吾 li jiang tuo wu

Stem erect, 36–45 cm tall, 5–10 mm in diam. at base, proximally glabrous, distally white arachnoid-puberulent and shortly pilose. Basal leaves petiolate; petiole to 18 cm, glabrous; wings 2–4 mm wide; sheath ca. 5.5 cm; leaf blade ovate-cordate, 13–15 × 10–11 cm, glabrous, pinnately veined, lateral veins 8–10 pairs, base shallowly cordate or rarely subtruncate, margin regularly denticulate, apex acute or obtuse. Proximal stem leaves 2 or 3, similar to basal leaves but smaller; petiole winged; sheath ovate, subopposite, 4–8 × to 2 cm, mouth of sheath spreading toward outside, forming an oblique petiole. Middle to distal stem leaves erect, ovate-lanceolate, to 7 × 1 cm, smaller distally, base semiamplexicaul or not, margin denticulate, apex acute. Synflorescence racemose, 10–12 cm, clustered initially; leaflike bracts ovate-lanceolate or narrowly lanceolate, to 3 cm × 3–6 mm, denticulate, narrowed at base into a short petiole; peduncles ca. 5 mm, slender. Capitula numerous; supplementary bracts linear-lanceolate, 8–10 mm. Involucral cupular, 5–8 mm, mouth ca. 1 cm in diam., outside glabrous; phyllaries in 2 rows, broadly obovate or elliptic, 3–4 mm wide, apex brown, broadly triangular, acute and recurved mucronate; inner phyllaries broadly membranous at margin. Ray florets 5–10, yellow; lamina oblong, 1.3–1.5 cm × 2–4.5 mm, apex obtuse; tube ca. 3 mm. Tubular florets numerous, 6–7 mm; tube ca. 4 mm. Achenes cylindric, ca. 4 mm. Pappus white, as long as tubular corolla. Fl. and fr. Aug–Sep.

- Stream banks, grassy slopes; 2600–3300 m. NW Yunnan.


粗茎橐吾 cu jing tuo wu

Stem erect, 15–120 cm tall, to 2.8 cm in diam. at base, proximally glabrous, distally white arachnoid-puberulent. Basal leaves petiolate; petiole 4–20 × 1–3 cm, base semiamplexicaul; leaf blade ovate-oblong or broadly ovate, 8–20 × 4–20 cm, both surfaces initially white arachnoid-puberulent, pinately veined, with robust midvein to 2 cm wide, with prominent reticulate veins, base truncate or oblique, margin irregularly dentate, apex rounded. Middle stem leaves sessile or shortly petiolate, base semi- or auriculate-amplexicaul; leaf blade ovate-oblong or oblong, 15 × 12 cm. Distalmost stem leaves smaller, sessile, ovate-lanceolate. Synflorescence racemose, clustered initially, elongating in fruit, to 40 cm; leaflike bracts linear-lanceolate, to 2 cm, apex acuminate; peduncles unequal, smaller distally, proximal peduncles to 8 cm, distal peduncles curved. Capitula numerous; supplementary bracts linear. Involucre broadly campanulate or hemispheric, 1.5–2 × to 2.5 cm, outside glabrous or sparsely white arachnoid-puberulent; phyllaries 8–13, in 2 rows, oblong or lanceolate, 3–8 mm wide, apex acute. Ray florets 6–8, yellow; lamina ovate-oblong or elliptic, to 16 × 3.5 cm, base ovate-oblong or elliptic, to 6 × 1.5 cm, apex acuminate; peduncles unequal, smaller distally, proximal peduncles to 8 cm, distal peduncles curved. Capitula numerous; supplementary bracts linear. Involucre broadly campanulate or hemispheric, 1.5–2 × to 2.5 cm, outside glabrous or sparsely white arachnoid-puberulent; phyllaries 8–13, in 2 rows, oblong or lanceolate, 3–8 mm wide, apex acute. Ray florets 6–8, yellow; lamina ovate-oblong or elliptic, to 16 × 3.5 cm, base ovate-oblong or elliptic, to 6 × 1.5 cm, apex acuminate; peduncles unequal, smaller distally, proximal peduncles to 8 cm, distal peduncles curved. Capitula numerous; supplementary bracts linear. Involucre broadly campanulate, 7–9 × 4–7 mm, out-
side green, glabrous; phyllaries 7 or 8, in 2 rows, oblong or lanceolate, apex dark brown, triangular or acuminated. Ray florets yellow; lamina oblong, 8–12 × 2–3 mm; tube 3–4 mm. Tubular florets numerous, 6–7 mm; tube ca. 2.5 mm. Pappus white, as long as florets numerous, 6–7 mm; tube ca. 2.5 mm. Achenes greenish brown, cuneate-cylindric, 5–6 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jun–Sep. 2n = 58*.

- Grassy slopes, forest understoreys, scrub, alpine meadows; 2800–4100 m. SW Sichuan, SE Xizang, NW Yunnan.


木里橐吾 mu li tuo wu

Stem erect, 28–32 cm tall, 4–6 mm in diam. at base, proximally glabrous, distally and synflorescence shortly yellowish brown pilose. Rosette of leaves not seen. Stem leaves oblong or ovate-oblong, 7–15 × 4.5–6 cm, smaller distally, glabrous or abaxially shortly pilose along veins, pinnately veined, base cuneate or rounded, margin denticulate, apex rounded; proximal stem leaves shortly petiolate, sheath amplexicaul; distal stem leaves sessile, base semiamplexicaul. Synflorescence racemose, 7–22 cm; leaflike bracts linear (except lower one ovate); peduncles 1–5 cm. Capitula 4–13; supplementary bracts linear. Involucre green or blackish purple, campanulate, 8–10 × 6–7 mm, outside shortly pilose; phyllaries 8–12, in 2 rows, lanceolate, apex acuminated; inner phyllaries membranous at margin. Ray florets 8–10, yellow; lamina linear-oblong, ca. 10 × 2 mm, apex obtuse. Tubular florets numerous, 6.5–7 mm; tube 2.5–3 mm. Achenes cylindrical, ca. 5 mm. Pappus white, shorter than tubular corolla. Fl. and fr. Jul–Oct.

- Grassy slopes, forest understoreys, scrub; 3800–4200 m. SW Sichuan, NW Yunnan.


橐吾 tuo wu

Othonna sibirica Linnaeus, Sp. Pl. 2: 924. 1753; Cineraria sibirica (Linnaeus) Reichenbach; Ligularia arctica Pojarkova; L. bucovinensis Nakai; L. longipes Pojarkova (1961), not C. C. Chang (1951); L. pojarjovana S. W. Liu & T. N. Ho; L. sibirica var. alpestris Tucezaninow; L. sibirica subsp. arctica (Pojarkova) V. G. Sergeyenko; L. sibirica var. gigantea Sergievskaya; L. sibirica var. glaberrima Candolle; L. sibirica var. gracilis Sergievskaya; L. sibirica var. vulgaris Candolle; L. ucrainca Minderova; Senecillus sibirica (Linnaeus) Simonkai; Senecio cicalifolius Schultz Bipontinus.

Stem erect, 20–200 cm tall, 2–11 mm in diam. at base, proximally glabrous, distally and synflorescence shortly yellowish brown pilose. Basal leaves petiolate; petiole 14–39 cm, glabrous, base sheathed; leaf blade ovate-cordate, triangular-cordate, reniform-cordate, or broadly cordate, 3.5–32 × 4.5–29 cm, glabrous, palmately veined, base cordate, margin regularly dentate, apex rounded or obtuse; sinus 1/4–1/3 as long as leaf blade, basal lobes oblong or suborbicular. Middle stem leaves similar, but shortly petiolate; petiole 3–14 cm; sheath enlarged, 3–6 cm. Distalmost stem leaves with only dentate sheaths. Synflorescence racemose, 4.5–42 cm, often clustered; leaflike bracts ovate or ovate-lanceolate, proximally to 3 × 0.8–2 cm, smaller distally, margin entire or denticulate, herbaceous; peduncles 4–12 mm, rarely proximally to 8 cm. Capitula numerous; supplementary bracts narrowly lanceolate, glabrous, margin entire, submembranous. Involucre sometimes purplish red, broadly campanulate, campanulate, or campanulate-turbinate, 7–11 × 6–11 mm, outside glabrous, base rounded; phyllaries 7–12, in 2 rows, lanceolate or oblong, 7–11 mm, margin membranous, apex acute, obtuse-triangular, or acuminated. Ray florets 5–8(–11), yellow; lamina oblanceolate or oblong, 1–2.2 cm × 3–5 mm, apex obtuse; tube 5–10 mm. Tubular florets numerous, 8–13 mm; tube 4–7 mm. Achenes brown, cylindric, 4–7 mm. Pappus yellowish, as long as tubular corolla. Fl. and fr. Jul–Oct. 2n = 60.

Swamps, wet grasslands, stream banks; below 2200 m. Heilongjiang, Jilin, Nei Mongol [Mongolia, Russia; Europe].


浅苞橐吾 qian bao tuo wu

Stem erect, 57–90 cm tall, 3.5–6 mm in diam. at base, proximally glabrous, distally sparsely white arachnoid-puberulent and shortly yellowish brown pilose. Basal leaves petiolate; petiole 20–49 cm, shortly yellowish brown pilose, abaxially with prominent palmate veins, base narrowly long sheathed; leaf blade broadly ovate or reniform, 8.5–13 × 10.5–22 cm, abaxially shortly pilose, adaxially glabrous, margin coarsely dentate, apex rounded, mucronate; sinus ca. 1/3 as long as leaf blade, broad; basal lobes oblong, 6–8 × 6.5–9 cm. Middle stem leaves shortly petiolate; sheath enlarged, densely shortly pilose; leaf blade reniform-cordate, to 8 × 14 cm. Synflorescence racemose, 10–40 cm, lax, spreading; leaflike bracts purplish red, yellowish red when dry, ovate-lanceolate, to 3 × ca. 1 cm, smaller distally, membranous, apex ciliate-acuminated; peduncles unequal, proximal peduncles to 5 cm, shorter distally, shortly yellow pilose. Capitula numerous; supplementary bracts ovate-lanceolate, as long as involucres, submembranous. Involucre shallowly cupular, 7–8 × 8–10 mm, base truncate, outside sparsely shortly pilose; phyllaries 9–13, in 2 rows, broadly oblong, to 4 mm, apex acute; inner phyllaries broadly membranous at margin. Ray florets yellow; lamina oblong, 8–10 × 2–3.5 mm; tube ca. 3 mm. Tubular florets numerous, 6.5–8 mm; tube 2–3 mm; limb cuneate. Achenes brown, cylindric, 4–6 mm. Pappus yellowish, as long as tubular corolla. Fl. Jul–Aug.

- Stream banks, valleys, grassy slopes; 3000–4000 m. NW Yunnan.


贵州橐吾 gui zhou tuo wu


Stem erect, ca. 60 cm tall, ca. 4 mm in diam. at base, proximally glabrous, distally and synflorescence shortly yellowish brown pilose. Rosette of leaves not seen. Proximal stem leaves petiolate; petiole to 20 cm, glabrous, base sheathed; leaf blade reniform or cordate, 3–3.5 × 5–5.5 cm, subleathery, glabrous, pal-
mately veined, margin triangular-dentate, apex rounded or acute; sinus ca. 1/3 as long as leaf blade, broad, basal lobes orbicular. Middle stem leaves shortly petiolate; sheath enlarged, ca. 3 cm; leaf blade smaller, reniform or cordate. Distal stem leaves smaller, sessile, shortly sheathed. Synflorescence paniculate-racemose, ca. 10 cm, proximally branched; leaflike and supplementary bracts linear, 4–6 mm, glabrous; peduncles 3–7 mm. Capitula numerous. Involute broadly campanulate or cupular, 7–9 mm, mouth to 1 cm in diam., outside glabrous; phyllaries 8, in 2 rows, oblong or ovate-oblong, 3–4 mm, nitid, apex obtuse or acute; inner phyllaries broadly membranous at margin. Tubular florets 6–7 mm; tube ca. 2 mm; limb campanulate. Pappus brown, slightly shorter than tubular corolla. Fl. Aug.

- Grasslands; 2000–2200 m. Chongzhou.


南川橐吾 nan chuan tuo wu

Stem erect, to 120 cm tall, ca. 6 mm in diam. at base, proximally glabrous, distally often purplish red, densely shortly yellow pilose. Basal leaves petiolate; petiole 30–40 cm, slender, glabrous, base narrowly sheathed; sheath to 5 cm, glabrous; leaf blade ovate-cordate or ovate-reniform, 4–9 × 5–11 cm, abaxially densely shortly yellow pilose, adaxially glabrous, palmately veined, margin undulate-dentate, apex rounded or acute, mucronate; sinus ca. 1/3 as long as leaf blade, narrow, basal lobes suborbicular, 4–6 cm, margin coarsely dentate. Middle to distal stem leaves similar but shortly petiolate or sessile; sheath enlarged. Synflorescence paniculate-racemose, to 53 cm, proximally branched; branches ascending, shortly yellow pilose, basal ones to 18 cm, with small capitula; leaflike bracts linear-lanceolate, to 2 cm, smaller distally; peduncles 3–9 mm, shortly yellow pilose. Capitula numerous. Involute narrowly campanulate, 8–11 × 4–5 mm, outside densely shortly yellow pilose; phyllaries 8, in 2 rows, lanceolate or narrowly lanceolate, 1.5–3 mm wide, margin narrowly membranous, apex acute or acuminate. Tubular florets 7–8 mm; tube ca. 3 mm. Pappus yellow, slightly shorter than tubular corolla. Fl. Aug. 2n = 58*.

- Grasslands; 1300–2000 m. Nanchuan (Nanchuan).


细茎橐吾 xi jing tuo wu

*Cremanthodium hookeri* C. B. Clarke, Compos. Ind. 169. 1876; *C. hookeri* f. angustiligulatum R. D. Good; *C. hookeri* f. irregulare R. D. Good; *C. hookeri* subsp. polycaphalum R. D. Good; *C. hookeri* f. regulare R. D. Good; *Ligularia evaginata* C. C. Chang; *L. hookeri* var. polycapha (R. D. Good) Handel-Mazzetti; *Senecio calbifolius* J. D. Hooker (1881), not (Maximowicz) Maximowicz (1871); *S. fedeki* H. Léveillé; *S. ficariifolius* H. Léveillé & Vaniot; *S. nimborum* Franchet; *S. saccoso-flabellatus* H. Léveillé; *S. sikkimensis* Franchet.

Stem erect, 17–40 cm tall, slender, 1.5–2 mm in diam. at base, proximally glabrous, distally white arachnoid-puberulent and shortly pilose. Basal leaves petiolate; petiole 5–10 cm, slender, glabrous, base sheathed; leaf blade cordate-sagittate or reniform, 7–24 × 15–55 mm, glabrous, palmately veined, abaxially with conspicuous reticulate veins, margin triangularly or coarsely dentate, between teeth shortly pilose, apex rounded; sinus 1/3–1/2 as long as leaf blade, broad; basal lobes oblong, divergent or not. Middle stem leaf solitary, shortly petiolate; sheath slightly enlarged, 1.5–2.5 cm, glabrous; leaf blade reniform, as large as basal leaves. Distalmost stem leaf solitary, bracteal, cymbiform, to 2.5 cm, margin dentate. Capitula solitary or 2–7(–16), in raceme; leaflike bracts narrowly lanceolate; peduncles to 3.5 cm, slender, arachnoid-puberulent and shortly pilose; supplementary bracts filiform. Involute campanulate or broadly campanulate, 8–11 × 6–8(–10) mm, outside glabrous; phyllaries 8–10, in 2 rows, oblong, to 3 cm wide, apex acute; inner phyllaries broadly membranous at margin. Ray florets yellow; lamina linear, 1–1.5 cm × 1.5–2 mm, apex acute; tube 2.5–5 mm. Tubular florets numerous, 7–8 mm; tube 3.5–4 mm. Achenes brown, cylindric, 4.5–6 mm. Pappus brown or pale brown, as long as tubular corolla. Fl. and fr. May–Sep. 2n = 58.

Grassy slopes, scrub, forest understories, stream banks, alpine meadows; 3000–4500 m. Shaanxi (Taibai Shan), Sichuan, Xizang, NW Yunnan [Bhutan, India (Sikkim), Nepal].


小叶橐吾 xiao ye tuo wu

Stem erect, to 100 cm tall, 2–4 mm in diam. at base, slender, glabrous. Basal leaves petiolate; petiole to 25 cm, slender, glabrous, base narrowly sheathed; leaf blade hastate or triangular, 1.7–3.5 × 2–5.5 cm, glabrous, palmately veined, base truncate or rarely shallowly cordate, margin revolute, obtusely denticate, apex obtuse or rounded, mucronate. Middle to distal stem leaves 2–4, shortly petiolate or sessile; sheath enlarged amplicaulis; leaf blade smaller, triangular to lanceolate. Synflorescence racemose, 8–15 cm; leaflike and supplementary bracts narrowly linear, 5–20 mm; peduncles 5–55 mm, slender, smaller distally. Capitula 3–6. Involute campanulate, 1–1.3 × to 1 cm, outside glabrous; phyllaries 7–10, in 2 rows, oblong, 2–3 mm wide, apex acute; inner phyllaries membranous at margin. Ray florets 5–8, yellow; lamina oblong, 1.2–2 × to 5 mm, apex obtuse; tube to 1 cm. Tubular florets numerous, 8–11 mm; tube 4–7 mm, slender; limb ca. 2 mm wide. Pappus rufous, 6–8 mm, shorter than tubular corolla. Fl. Jul.

- Stream banks, swamps; 1900–2300 m. Yunnan (Kunming).


沼生橐吾 zhuo sheng tuo wu


Stem erect, 37–52 cm tall, slender, 2–4 mm in diam. at base, proximally glabrous, distally and synflorescence shortly pilose. Basal leaves petiolate; petiole 8.5–29 cm, slender, glabrous, base sheathed; leaf blade triangular-sagittate or ovate-
cordate, 3–9 × 2.2–12.5 cm, glabrous, palmately veined, margin dentate and ciliate, apex acute; sinus 1/4–1/3 as long as leaf blade, broad; basal lobes triangular, apex obtuse or acute. Middle to distal stem leaves shortly petiolate; sheath enlarged, amplicial; leaf blade smaller, cordate or ovate-cordate. Synflorescence racemose, 10–16 cm, clustered, spicate or lax; leaflike bracts linear, to 1.7 cm; peduncles 3–4(–8) mm, slender, shortly brown pilose. Capitula numerous; supplementary bracts subulate. Involucre campanulate-turbinate, 6–9 × 3–5 mm, outside glabrous; phyllaries 6–8, in 2 rows, oblong, apex acute; inner phyllaries membranous at margin. Ray florets 5–8, yellow; lamina oblong, 7–10 mm, ca. 1.5 mm wide, apex obtuse; tube 3–4 mm. Tubular florets numerous, 5–7 mm; tube 2–3 mm; limb broadly campanulate, ca. 2 mm wide. Achenes brown, cylindrical, 4–5 mm. Pappus yellowish, slightly shorter than tubular corolla. Fl. Jul–Aug, fr. Aug–Sep.

Swamps, wet grasslands, scrub, forest understories; 3300–5300 m. SW Gansu, W Sichuan, SE Xinjiang, NW Yunnan [NE Myanmar].


穗序橐吾 sui xu tuo wu

Senecio subspectatus Bureau & Franchet, J. Bot. (Morot) 5: 75. 1891; Ligularia nudicaulis C. C. Chang; Senecillis subspecta (Bureau & Franchet) Kitamura; Senecio fribillosus Dunn.

Stem erect, 50–100 cm tall, slender, 3–4 mm in diam. at base, proximally glabrous, distally and synflorescence white puberulent. Basal leaves petiolate; petiole 5–30 cm, slender, glabrous, base sheathed; leaf blade ovate-cordate, hastate, or sagitate, 3.2–10.5 × 4–15 cm, abaxially pubescent, adaxially glabrous, palmately veined, margin triangular- or sharply dentate and ciliate, apex obtuse or rounded, mucronate; sinus 1/4–1/3 as long as leaf blade, broad; basal lobes oblong, margin coarsely dentate, sometimes divergent. Middle stem leaves similar but smaller, shortly petiolate; sheath narrow, usually not amplicial. Distal stem leaves sessile, smaller. Synflorescence racemose, to 30 cm, proximally branched; leaflike bracts linear-lanceolate, 6–35 mm, margin entire; peduncles 2–8 mm. Capitula numerous; supplementary bracts linear. Involucre campanulate, 4–10 mm, mouth 4–8 mm in diam., outside glabrous; phyllaries 6 or 7, in 2 rows, oblong or lanceolate, 2–3 mm wide, apex triangular or acute; inner phyllaries membranous at margin. Florets all tubular, numerous, yellow, 6–7 mm; tube 2.5–3 mm. Pappus white, slightly shorter than tubular corolla. Fl. Jul–Sep.

● Stream banks, forest margins, forest understories, alpine scrub; 2800–5300 m. SW and W Sichuan, NW Yunnan.


川鄂橐吾 chuan e tuo wu

Senecio wilsonianus Hemsley, Gard. Chron., ser. 3, 38: 212. 1905; Ligularia polycephala (Hemsley) Nakai; L. sibirica (Linnaeus) Cassini var. polycephala (Hemsley) Diels; Senecillis wilsoniana (Hemsley) Kitamura; Senecio cacaliifolius Schultz Bipontinus var. polycephala (Hemsley) Franchet; S. ligularia J. D. Hooker var. polycephalus Hemsley.

Stem erect, robust, 60–120 cm tall, to 1 cm in diam. at base, shortly pilose. Basal leaves petiolate; petiole 19–51 cm, robust, shortly pilose, base sheathed; leaf blade reniform, 6.5–13 × 11–24 cm, abaxially densely shortly pilose, adaxially glabrous, palmately veined, abaxially with prominent reticulate veins, base cordate, margin densely sharply dentate, apex rounded; sinus ca. 1/3 as long as leaf blade, broad. Middle stem leaves similar but smaller. Distal stem leaves reduced. Synflorescence racemose, 15–34 cm; leaflike bracts filiform; peduncles 1–1.5 cm. Capitula numerous; supplementary bracts subulate. Involucre campanulate to broadly turbinate, 7–8 × 6–7 mm, outside glabrous; phyllaries 7 or 8, in 2 rows, oblong or lanceolate, 2–4 mm wide, apex acute or triangular; inner phyllaries membranous at margin. Ray florets 5 or 6, yellow; lamina oblong, 7–9 × 3–4 mm, apex rounded. Tubular florets numerous, 6–7 mm; tube 2.5–3 mm. Pappus white, as long as tubular corolla. Fl. Jul–Sep.

● Grassly slopes, forest understories; 1600–2100 m. W Hubei, E Sichuan.


亚东橐吾 ya dong tuo wu

Senecio atkinsonii C. B. Clarke, Compos. Ind. 207. 1876; S. cacaliifolius Schultz Bipontinus var. atkinsonii (C. B. Clarke) Franchet; S. ligularia J. D. Hooker var. atkinsonii (C. B. Clarke) J. D. Hooker.

Stem erect, 60–83 cm tall, 5–9 mm in diam. at base, proximally glabrous, distally and synflorescence shortly brown pilose and white puberulent. Basal leaves petiolate; petiole 38–45 cm, slender, glabrous, base narrowly sheathed; leaf blade abaxially pale green, adaxially dark green, reniform or cordate-ovate, 7–11 × 8–16 cm, abaxially shortly pilose along veins, adaxially glabrous, palmately veined, base broadly cordate or sagitate, margin irregularly triangularly dentate and ciliate, apex rounded; sinus ca. 1/3 as long as leaf blade. Middle to distal stem leaves similar but smaller, petiolate; petiole to 12 cm; sheath ca. 7 × 1 cm. Synflorescence racemose, 9–30 cm; leaflike bracts linear, shorter than peduncle or proximal ones linear-lanceolate, longer; peduncles 5–11 mm, equal or proximal peduncles longer. Capitula numerous; supplementary bracts linear, as long as involucr. Involucre campanulate, 7–11 × ca. 5(–7) mm, outside glabrous; phyllaries 8 or 9, in 2 rows, oblong or lanceolate, 1.5–2.5 mm wide, apex acute; inner phyllaries broadly membranous at margin. Ray florets yellow; lamina narrowly oblong, 8–10 × ca. 2 mm, apex rounded or subtruncate. Tubular florets 10–13, 6–7 mm; tube 2–3 mm; limb to 2 mm wide. Pappus white, slightly shorter than tubular corolla. Fl. Jun–Jul.

● Stream banks, forest understories; 3000–3500 m. S Xizang [Bhutan, India (Sikkim)].


毛叶橐吾 mao ye tuo wu
Stem erect, to 100 cm tall, 5–6 mm in diam. at base, proximally glabrous, distally shortly pilose. Basal leaves petiolate; petiole 20–29 cm, slender, glabrous, base sheathed; leaf blade reniform, 4.5–5.5 × 6–10 cm, abaxially densely shortly white pilose, adaxially glabrous, palmately veined, margin triangular-dentate, apex obtuse or rounded; sinus ca. 3/5 as long as leaf blade, broad. Stem leaves 2 or 3, petiolate and sheathed; sheath enlarged, 4–8 × 2.5–4 cm, conspicuously parallel-veined and shortly white pilose, margin entire; petiole 1–9 cm, slender; leaf blade reniform, smaller than basal leaves, abaxially shortly white pilose, adaxially glabrous, apex acute. Synflorescence racemose, 30–35 cm, with 1 or 2 branches at base; leaflike bracts ovate-lanceolate, 2.5–4 × 1.3 cm, denticulate, smaller distally linear, peduncles 3–35 mm, shortly pilose. Capitula numerous; supplementary bracts linear. Involucre campanulate, 6–9 × 5–8 mm, outside shortly pilose, base subtruncate; phyllaries 12 or 13, in 2 rows, oblong, 1.5–2.5 mm wide, margin brown membranous, acumen acute or acuminate. Ray florets yellow; lamina linear-oblong, 8–9 × ca. 1 mm; tube ca. 4 mm. Tubular florets numerous, 7–8 mm; limb campanulate, as long as tube. Achenes cylindric, ca. 5 mm. Pappus pale yellowish brown, as long as tubular corolla. Fl. and fr. Jul–Aug.


Ligularia longipes

Stem erect, 100–120 cm tall, 1–1.2 cm in diam. at base, densely shortly brown pilose. Basal leaves petiolate; petiole to 63 cm, slender, glabrous, middle to distal half entirely winged, base sheathed; leaf blade ovate-cordate, 18–40 × 16–30 cm, glabrous or abaxially sparsely arachnoid-puberulent, palmately veined, base cordate, margin densely sharply dentate, apex acute or obtuse. Middle stem leaves similar but smaller, shortly petiolate and winged; wing margin entire, undulate; sheath much enlarged, to 6 × ca. 3 cm, margin laciniate-dentate or sometimes entire. Distalmost stem leaves sessile; sheath enlarged, suborbicular, margin laciniate-dentate; leaf blade ovate, ca. 3 cm, margin laciniate-dentate. Synflorescence racemose, to 65 cm; leaflike bracts ovate-lanceolate to linear-lanceolate, proximal ones to 6.5 cm, smaller distally, margin laciniate-dentate or entire, apex acuminate; peduncles 3–15 mm, slender, densely shortly yellowish brown pilose. Capitula numerous; supplementary bracts linear-lanceolate. Involucre narrowly campanulate, 1–1.4 cm × ca. 5 mm, outside glabrous; phyllaries 6–8, in 2 rows, oblong or narrowly oblong, 1.5–2.5 mm wide, apex acumen; inner phyllaries broadly membranous at margin. Ray florets 4–6, yellow; lamina linear-oblong, 1–1.8 cm × 2–3 mm, apex obtuse; tube 7–9 mm. Tubular florets numerous, 1.1–1.3 cm, extending from involucre; tube 6–8 mm, slender. Pappus yellow, ca. 4 mm, ca. 1/2 as long as tube of tubular corolla. Fl. and fr. Aug–Sep.

Stream banks, forests; 2100–3400 m. W Yunnan [E Myanmar].


Ligularia heterophylla

Stem erect, 74–125 cm tall, 4–8 mm in diam. at base, densely reddish brown pilose. Basal leaves petiolate; petiole 22–30 cm, densely reddish brown pilose, base narrowly sheathed; leaf blade hastate or triangular-hastate, 6–18 × 10–18 cm, abaxially densely brown pilose, adaxially deciduously shortly scabrous-pilose, palmately veined, margin irregularly dentate, apex acute or subrounded; sinus ca. 1/3 as long as leaf blade, broad; basal lobes suborbicular, slightly divergent. Middle stem leaves numerous, dense, shortly petiolate; sheath enlarged, densely reddish brown pilose; leaf blade triangular-cordate, 5.5–11 × 7.5–12 cm, margin denticulate, apex acuminate; sinus broad, basal lobes divergent. Distal stem leaves sessile, ovate, abaxially brown pilose, adaxially scabrous, base semiamplexicaul. Synflorescence racemose, 22–45 cm, reddish brown pilose; leaflike bracts ovate to lanceolate, 8–30 mm, proximal ones larger, sessile, distal ones smaller, shortly petiolate; peduncles to 1 cm. Capitula numerous; supplementary bracts linear-lanceolate. Involucre narrowly campanulate, 7–12 × 3–5 mm, outside glabrous; phyllaries 6–8, in 2 rows, oblong or narrowly oblong, 1.5–2.5 mm wide, apex acute; inner phyllaries broadly membranous at margin. Ray florets 2 or 3, yellow; lamina oblong-lanceolate, 1–1.2 cm × 3–4 mm, apex obtuse; tube 5–6 mm. Tubular florets numerous, 1–1.1 cm; tube 5–6 mm. Pappus yellow, as long as or slightly shorter than tube of tubular corolla. Fl. Jul–Aug.

● Alpine scrub; ca. 3600 m. Xizang (Bomi).


Senecio lati hastatus

Stem erect, 35–60 cm tall, 3.5–5 mm in diam. at base, proximally glabrous, distally and synflorescence white puberulently and shortly yellowish brown pilose. Basal leaves petiolate; petiole 15–35 cm, glabrous, base narrowly sheathed, distally narrowly winged; leaf blade broadly hastate or triangular-hastate, 4–11 × 9–15 cm, glabrous, palmately veined, margin regularly dentate, apex rounded or triangular-acute; sinus broad; basal lobes divergent, 2.5–5 cm, outer margin coarsely dentate. Middle stem leaves petiolate or sessile; sheath enlarged, to 7 cm, margin dentate or rarely entire; leaf blade smaller, triangular- or cordate-hastate. Distal stem leaves sheathlike, broadly ovate to ovate-lanceolate, margin dentate. Synflorescence racemose, 10–30 cm, clustered or lax; leaflike bracts ovate to lanceolate, proximal ones to 5 cm, smaller upward, margin dentate, apex acute; peduncles to 1.3 cm. Capitula 7–24; supplementary bracts narrowly lanceolate, margin dentate. Involucre broadly

 senecio lati hastata


宽戟橐吾 kuan ji tuo wu


● Alpine meadows; 2900–3100 m. W Yunnan.

叶状鞘橐吾 ye zhuang qiao tuo wu

Ligularia longipes C. C. Chang.

Ligularia heterophylla

Stem erect, to 100 cm tall, 5–6 mm in diam. at base, proximally glabrous, distally shortly pilose. Basal leaves petiolate; petiole 20–29 cm, slender, glabrous, base sheathed; leaf blade reniform, 4.5–5.5 × 6–10 cm, abaxially densely shortly white pilose, adaxially glabrous, palmately veined, margin triangular-dentate, apex obtuse or rounded; sinus ca. 3/5 as long as leaf blade, broad. Stem leaves 2 or 3, petiolate and sheathed; sheath enlarged, 4–8 × 2.5–4 cm, conspicuously parallel-veined and shortly white pilose, margin entire; petiole 1–9 cm, slender; leaf blade reniform, smaller than basal leaves, abaxially shortly white pilose, adaxially glabrous, apex acute. Synflorescence racemose, 30–35 cm, with 1 or 2 branches at base; leaflike bracts ovate-lanceolate, 2.5–4 × 1–1.3 cm, denticulate, smaller distally linear, peduncles 3–35 mm, shortly pilose. Capitula numerous; supplementary bracts linear. Involucre campanulate, 6–9 × 5–8 mm, outside shortly pilose, base subtruncate; phyllaries 12 or 13, in 2 rows, oblong, 1.5–2.5 mm wide, margin brown membranous, acumen acute or acuminate. Ray florets yellow; lamina linear-oblong, 8–9 × ca. 1 mm; tube ca. 4 mm. Tubular florets numerous, 7–8 mm; limb campanulate, as long as tube. Achenes cylindric, ca. 5 mm. Pappus pale yellowish brown, as long as tubular corolla. Fl. and fr. Jul–Aug.

● Alpine scrub; ca. 3600 m. Xizang (Bomi).

campanulate, 9–11 × 8–12 mm, outside glabrous; phyllaries 8–10, in 2 rows, oblong, 3–5 mm wide, apex triangular-acute, mucronate; inner phyllaries broadly brown membranous at margin. Ray florets yellow; lamina linear-oblong or linear-lanceolate to linear, 2.5–4 cm × 2–5 mm, apex acute or acuminate; tube ca. 7 mm. Tubular florets numerous, 1–1.2 cm, extending from involucre; tube 6–7 mm. Achenes cylindric, ca. 6 mm. Pappus pale brown or reddish brown in fruit, as long as tube of tubular corolla. Fl. and fr. Jul–Oct. 2n = 58*.

- Stream banks, grassy areas in swamps, forest understories, grasslands; 2400–4000 m. SW Sichuan (Muli), NW Yunnan.


黄亮橐吾 huang liang tuo wu


Stem erect, 40–115 cm tall, 4–6 mm in diam. at base, proximally glabrous, distally and synflorescence shortly yellow pilose. Basal leaves petiolate; petiole to 45 cm, glabrous, base sheathed, distally narrowly winged; leaf blade triangular-ovate or ovate-cordate, (4.5–)6–14 × (3.5–)8–18 cm, glabrous, palesmutely veined, base cordate, margin regularly dentate, apex obtuse or acute; sinus ca. 1/3 as long as leaf blade; basal lobes slightly divergent, oblong, outer margin coarsely dentate. Middle stem leaves petiolate or sessile, small; petiole winged; sheath enlarged, tubular or leaflike, suborbicular, sometimes auriculate, margin dentate; blade ovate-triangular or triangular, to 9 × 11 cm. Distal stem leaves sessile, ovate or orbicular. Synflorescence racemose, 9–30 cm, lax; leaflike bracts ovate-lanceolate, proximal ones to 4 × 3 cm, smaller distally, margin dentate, apex acuminate; peduncles erect, 5–10 mm, slender, sometimes proximal ones to 8 cm. Capitula 10–25; supplementary bracts narrowly lanceolate, margin dentate. Involucre broadly campanulate, 9–11 × 5–9 mm, outside glabrous; phyllaries 8–10, in 2 rows, oblong, 2–4 mm wide, apex triangular-acute; inner phyllaries broadly brown membranous at margin. Ray florets yellow; lamina oblanceolate, 1.2–2 cm × 3–6 mm, apex obtuse; tube 5–6 mm. Tubular florets numerous, 1–1.1 cm, tube ca. 5 mm. Achenes brown, oblong, 5–6 mm. Pappus pale yellow, as long as tube of tubular corolla. Fl. Jul–Oct.

- Stream banks, grassy slopes, alpine grasslands at montane summits; 1600–4000 m. S Sichuan, NE to NW Yunnan.


蹄叶橐吾 ma ti ye tuo wu

Plants long yellowish red pilose. Stem erect, to 60 cm tall, ca. 3 mm in diam. at base. Basal leaves petiolate; petiole 7–16 cm, slender, long yellowish red pilose, base narrowly sheathed; leaf blade horseshoe-shaped, 3–20 × 4–9 cm, abaxially densely hairy, adaxially glabrous or sparsely hairy, palesmutely veined, base deeply cordate, margin regularly dentate and ciliate, apex rounded, triangular-mucronate; sinus ca. 1/2 as long as leaf blade, narrow; basal lobes not divergent, margin lacinate-dentate. Middle to distal stem leaves sessile; sheath enlarged, cymoform or suborbicular, amplexicaul, margin dentate; leaf blade triangular-reniform, 3–4 cm, to 6 cm wide, apex acute. Synflorescence racemose, short, clustered; leaflike bracts ovate, 1.5–1.8 × ca. 1 cm, margin lacinate-dentate and ciliate; peduncles 3–12 mm. Capitula 5–10; supplementary bracts narrowly ovate, longer than involucre, shortly petiolate, margin lacinate-dentate and ciliate. Involucre narrowly campanulate, ca. 10 × 5 mm, outside glabrous; phyllaries 7 or 8, in 2 rows, narrowly oblong, 2–3 mm wide, apex triangular-acute; inner phyllaries membranous at margin. Ray florets 5, yellow; lamina linear-oblong, 1.3–2 cm × ca. 4 mm, apex obtuse; tube ca. 6 mm. Tubular florets numerous, 11–11.5 mm; tube 5–6 mm. Pappus reddish yellow, ca. 5 mm, shorter than tube of tubular corolla. Fl. Jul–Aug.

- Forest margins, grassy slopes; 2500–2800 m. S Sichuan.


蹄叶囊苞 ti ye tuo wu

_Cineraria fischeri_ Ledebour, Index Sem. Horti Dorpat. 1820: 17. 1820; _C. speciosa_ Schrader ex Link; _Hoppea speciosa_ (Schrader ex Link) Reichenbach; _Ligularia sibirica_ (Linnaeus) Cassini var. _speciosa_ (Schrader ex Link) Candolle; _L. speciosa_ (Schrader ex Link) Fischer & C. A. Meyer; ?_L. splendens_ (H. Léveillé & Vaniot) Nakai; _Senecilis fischeri_ (Ledebour) Kitamura; _Senecio cacaliifolius_ Schultz Bipontinus var. _speciosus_ (Schrader ex Link) Franchet; ?_S. splendens_ H. Léveillé & Vaniot.

Stem erect, 80–200 cm tall, 5–10 mm in diam. at base, proximally glabrous or shortly yellowish brown pilose, distally and synflorescence densely shortly yellowish brown pilose. Basal leaves petiolate; petiole 18–59 cm, shortly brown pilose, base sheathed; leaf blade abaxially pale green, adaxially green, reniform, 8–30 × 13–40 cm, abaxially shortly brown pilose, adaxially glabrous, palesmutely veined, with 5–7 prominent principal veins, margin regularly dentate, apex rounded, sometimes mucronate; sinus ca. 1/3 as long as leaf blade, broad; basal lobes suborbicular, not divergent. Middle to distal stem leaves shortly petiolate; sheath enlarged; leaf blade reniform, 4.5–5.5 × 6–5 mm. Synflorescence racemose, 27–75 cm; proximal leaflike bracts ovate or ovate-lanceolate, to 6 × 2 cm, smaller distally, herbaceous, margin dentate, apex mucronate; distal leaflike bracts lanceolate; peduncles: proximal ones to 9 cm, smaller distally, slender. Capitula numerous; supplementary bracts narrowly lanceolate to linear. Involucre campanulate, 7–20 × 5–14 mm, outside shortly brown pilose; phyllaries 8–14, in 2 rows, oblong, 3–5 mm wide, apex acute; inner phyllaries broadly membranous at margin. Ray florets 5–9, yellow; lamina oblong, 1.5–2.5 cm × to 6 mm wide, apex obtuse; tube 5–11 mm. Tubular florets numerous, 8–17 mm; tube 5–9 mm. Achenes dark brown, fusiform-cylindric, 6–8 mm. Pappus yellowish brown, shorter than tubular corolla. Fl. and fr. Jul–Oct. 2n = 60.

Stream banks, swamp meadows, grassy slopes, scrub, forest margins; below 2500 m. Anhui, Heilongjiang, Henan, Hubei, Jilin, Liaoning, Nei Mongol, Shaanxi, Sichuan, Zhejiang [Bhutan, India, Japan, Kashmir, Korea, Mongolia, Myanmar, Nepal, Russia (Far East, E Siberia)].

浙江橐吾 zhe jiang tuo wu

Stem erect, to 100 cm tall, distally shortly pilose. Basal leaves petiolate; petiole to 21 cm, shortly pilose, base narrowly sheathed; leaf blade abaxially pale green, adaxially green, cor- date, 8.5 × 13 cm, abaxially shortly pilose along veins, margin mucronate-dentate. Proximal stem leaves petiolate; petiole to 21 cm; leaf blade coriaceous, to 18 cm, base coriaceous-sagittate. Middle to distal stem leaves small, shortly petiolate; leaf blade reniform-cordate. Distalmost stem leaves bracteolate, lanceolate. Synflorescence racemose, narrow; leaflike bracts lanceolate; peduncles shorter. Capitula numerous; involucre tubular, ca. 1.6 × 1.2–1.4 cm; phyllaries 8, in 2 rows, lanceolate, apex densely ciliate. Florets 27 or 28, all tubular, 1.4–1.7 cm; tube 6.5–9 mm. Pappus yellow, as long as tubular corolla. Fl. Jul–Aug.


白序橐吾 bai xu tuo wu

Stem erect, to 90 cm tall, to 1.2 cm in diam. at base, proximally glabrescent, distally and synflorescence densely white arachnoid-puberulent. Basal leaves petiolate; petiole to 36 cm, white arachnoid-puberulent, base narrowly sheathed, not winged or distally narrowly winged; wing margin dentate; leaf blade reniform, 13–14 × 17.5–20 cm, abaxially sparsely arachnoid-puberulent along veins, adaxially glabrous, palmately veined, with 9 principal veins, abaxially conspicuously prominent, margin minutely sharply dentate, apex rounded or obtuse; sinus ca. 1/3 as long as leaf blade, broad; basal lobes suborbicular, outer margin coarsely dentate. Middle to distal stem leaves similar but smaller, shortly winged petiolate; wing margin dentate; sheath enlarged, 3–5 cm, margin entire or dentate. Synflorescence racemose, 15–20 cm, distally clustered, proximally lax; leaflike bracts spatulate, proximal ones to 6 cm, smaller distally, submembranous, shortly petiolate, margin dentate, apex acuminated; peduncles: proximal ones to 6 cm, smaller distally, slender. Capitula numerous; supplementary bracts narrowly lanceolate, as long as or slightly longer than involucre. Involucre broadly campanulate, 1–1.5 × 1.5–2 cm, outside shortly pilose; phyllaries 10–14, in 2 rows, oblong, 3–4 mm wide, apex broadly triangular; inner phyllaries broadly brown membranous at margin. Ray florets 5 or 6, yellow; lamina linear, 1.5–2 cm × ca. 2 mm, apex obtuse; tube 6–7 mm. Tubular florets numerous, 1–1.2 cm, extending from involucre; tube 6–7 mm. Pappus yellow, as long as tubular corolla. Fl. Aug.

● Forest understories, grassy slopes; ca. 1100 m. Anhui, Zhejiang (W Tianmu Shan).


离舌橐吾 li she tuo wu


Stem erect, 60–200 cm tall, 4–9 cm in diam. at base, proximally glabrous, distally and synflorescence white arachnoid-puberulent and shortly yellowish brown pilose, later white arachnoid hairs deciduous. Basal leaves petiolate; petiole 15–104 cm, solid, base narrowly sheathed; leaf blade triangular-ovate-cordate, sometimes subreniform, 7–24 × 12–35 cm, glabrous, or abaxially shortly white pilose along veins, palmately veined, base subhastate, margin regularly sharply dentate, apex rounded or obtuse; sinus ca. 1/3 as long as leaf blade, broad; basal lobes oblong or suborbicular, divergent. Middle to distal stem leaves similar but smaller, shortly petiolate to sessile; sheath enlarged, shortly yellowish brown pilose, margin entire. Synflorescence racemose, 8–35 cm; proximalmost leaflike bracts (2–5 at base of synflorescence) ovate, distal ones lanceolate to linear, 9–25 × 15 mm, herbaceous, margin dentate and ciliate, apex acuminate; peduncles 2–12 cm, smaller distally. Capitula numerous; supplementary bracts linear. Involucre campanulate, 1–1.1 cm × 5–7 mm, outside shortly yellowish brown pilose; phyllaries 6–8, in 2 rows, oblong, 2–3 mm wide, apex triangular; inner phyllaries membranous at margin. Ray florets 2–6, yellow; lamina oblong, 1.2–1.8 cm × 2–4 mm, apex rounded or acute. Tubular florets numerous, 1–1.1 cm; tube 5–6 mm. Achenes dark brown, fusiform-cylindric, 5–8 mm. Pappus yellowish brown, shorter than tubular corolla. Fl. Jul–Aug.

Grassy slopes, meadows, swamp meadows, scrub, forest margins; below 1200 m. Heilongjiang [Russia (Far East)].
Tubular florets 7–12, extending from involucre, 1–1.1 cm; tube glabrous, palmately veined, margin regularly sharply triangular-leaves petiolate; petiole 16–43 cm, glabrous, base narrowly sheathed; base narrowly sheathed; leaf blade orbicular-cordate or subreniform, 8–8.5 × 7–8.5 cm, glabrous, palmately veined, margin coarsely dentate, apex rounded or truncate; sinus 1/3–1/2 as long as leaf blade, broad. Stem leaves similar but smaller, shortly petiolate. Distalmost stem leaves ovate, base narrowly sheathed. Involucre campanulate, ca. 1 cm, outside shortly pilose; phyllaries 6–9, in 2 rows, oblong; inner phyllaries broadly membranous at margin. Florets 8, all tubular, 6–7 mm, higher than involucre; tube as long as limb. Achenes (immature) cylindric. Pappus yellowish brown, as long as tube of tubular corolla. Fl. Jul.


**河北橐吾** hei hei tuo wu

Stem erect, to 45 cm tall, ca. 3 mm in diam. at base, proximally glabrous, distally shortly yellowish brown pilose. Basal leaves petiolate; petiole purplish red, ca. 13 cm × 1.5 mm, shortly pilose, base narrowly sheathed; leaf blade orbicular-cordate or subreniform, 8–8.5 × 7–8.5 cm, glabrous, palmately veined, margin coarsely dentate, apex rounded or truncate; sinus 1/3–1/2 as long as leaf blade, broad. Stem leaves similar but smaller, shortly petiolate. Distalmost stem leaves ovate, base narrowly sheathed. Involucre campanulate, ca. 1 cm, outside shortly pilose; phyllaries 6–9, in 2 rows, 1.5–2.5 mm wide, apex triangular; inner phyllaries broadly membranous at margin. Florets 8, all tubular, 6–7 mm, higher than involucre; tube as long as limb. Achenes (immature) cylindric. Pappus yellowish brown, as long as tube of tubular corolla. Fl. Jul.

Grassy slopes; ca. 2400 m. Gansu (Minxian).

### 12. **Ligularia pianmaensis** Y. L. Chen ex T. L. Ming.

**缅甸橐吾** mian dian tuo wu

*Ligularia intermedia* var. *oligantha* Nakai; *L. sibirica* (Linnaeus) Cassini subsp. *intermedia* (Nakai) Kitamura; *L. sinica* Kitagawa; *Seneckella intermedia* (Nakai) Kitamura.

Stem erect, to 100 cm tall, to 1 cm in diam. at base, proximally white arachnoid-puberulent. Basal leaves petiolate; petiole 16–43 cm, glabrous, base narrowly sheathed; leaf blade cordate or reniform, 8–16 × 12–23.5 cm, glabrous, palmately veined, margin regularly sharply triangular-dentate, apex obtuse or mucronate; sinus ca. 1/3 as long as leaf blade, broad. Middle to distal stem leaves similar but smaller, shortly petiolate or sessile; sheath slightly enlarged. Distalmost stem leaves bracteate, ovate-lanceolate. Synflorescence racemose, 22–25 cm; leaf-like bracts linear or linear-lanceolate, proximal ones to 3 cm, smaller distally; peduncles 3–10 mm, glabrescent. Capitula numerous; supplementary bracts linear. Involucre campanulate, 8–11 × 4–5 mm, outside glabrous; phyllaries 6–8, in 2 rows, oblong, ca. 3 mm wide, margin membranous, apex triangular-acute. Ray florets 4–6, yellow; lamina oblong, 1.7–2 cm × ca. 3 mm, apex obtuse; tube ca. 7 mm. Tubular florets 7–12, extending from involucre, 1–1.1 cm; tube ca. 6 mm, base slightly thick. Achenes cylindric, 5–7 mm. Pappus purplish brown, sometimes white, shorter than tube of tubular corolla. Fl. and fr. Jul.–Oct.

Stream banks, grassy slopes, forest understoreys, alpine meadows; 100–3400 m. Gansu, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jilin, Liaoning, Nei Mongol, Shaanxi, Shanxi, Sichuan, NE and NW Yunnan [Korea].

### 113. **Ligularia hopeiensis** Nakai, J. Jap. Bot. 16: 76. 1940.

**河北橐吾** hei hei tuo wu

Stem erect, to 100 cm tall, ca. 1 cm in diam. at base, proximally glabrous, distally shortly yellowish brown pilose. Rosette of leaves early deciduous. Stem leaves 3, proximal leaves petiolate; petiole to 80 cm, base sheathed; leaf blade reniform, ca. 30 × 50 cm, palmately veined, margin dentate. Distalmost stem leaves with petiole to 37 cm; leaf blade reniform, ca. 7 × 15.5 cm, abaxially shortly pilose, adaxially glabrous, margin dentate. Distalmost stem leaves smaller; leaf blade ca. 3.7 × 6 cm. Synflorescence racemose, to 18 cm; leaf-like bracts linear; peduncles 5–10 mm, shortly pilose. Capitula numerous. Involucre campanulate, ca. 1.3 cm, outside shortly pilose; phyllaries 7 or 8, in 2 rows, 1.5–2 mm wide, apex acute. Florets all tubular, 8 or 9; tube 4–5 mm. Achenes ca. 5 mm. Pappus early deciduous. Fl. and fr. unknown.

Grassy slopes; ca. 2400 m. Gansu (Minxian).


**缅甸橐吾** mian dian tuo wu

*Ligularia pianmaensis* Y. L. Chen ex T. L. Ming.

Stem erect, 25–70 cm tall, 3–5 mm in diam. at base, glabrescent. Basal leaves petiolate; petiole to 25.5 cm, slender, glabrous, base narrowly sheathed; leaf blade cordate-hastate or ovate-sagittate, rarely reniform, 4.2–11 × 8–10 cm, abaxially shortly pilose, adaxially glabrous, palmately veined, base broadly cordate, margin regularly coarsely dentate, apex acute or subrounded; sinus ca. 1/3 as long as leaf blade, broad; basal lobes orbicular or oblong. Middle stem leaves sessile, cordate, 4–7 × 5–9 cm, apex acute; sheath enlarged, 2–3 cm. Distalmost stem leaves only with enlarged sheaths. Synflorescence racemose, to 10 cm; leaf-like bracts smaller distally, proximal ones lanceolate, to 4 cm, middle to distal ones linear; peduncles to 3 cm, shortly yellowish brown pilose. Capitula numerous; supplementary bracts linear, 6–10 mm. Involucre campanulate, 8–10 × 5–7 mm, outside glabrous; phyllaries 7–10, in 2 rows, oblong, 2–4 mm wide, apex acute; inner phyllaries broadly membranous at margin. Ray florets yellow; lamina oblong, 8–10 × 2–6 mm, apex rounded, denticulate; tube 3.5–5 mm. Tubular florets 7–10 mm; tube 3.5–5 mm. Achenes cylindric, 5–6 mm. Pappus pale yellowish brown, as long as tube of tubular corolla. Fl. and fr. Aug.

Grassy slopes; ca. 3600 m. Xizang, W Yunnan [NE Myanmar].

*Ligularia pianmaensis*, according to the original description (Fl. Yunnan. 13: 833, 2004), is similar to *L. chimiliensis*, but differs in having fewer (7–9) capitula and ovate leaf-like bracts 1–5.5 × 0.5–2.5 cm.

Stem erect, to 56 cm tall, ca. 4 mm in diam. at base, proximally glabrous, distally white arachnoid-puberulent and shortly yellowish brown pilose. Basal leaves petiolate; petiole to 30 cm, glabrous, base sheathed, apically narrowly winged; leaf blade narrowly triangular-hastate or ovate-cordate, 4.8–5.5 × 5–9 cm, abaxially shortly yellowish brown pilose only along veins, adaxially shortly yellowish brown pilose, palmately veined, margin denticulate, rarely crenate, apex acuminate or acute, rarely retuse; sinus 1/4–1/3 as long as leaf blade, broad; basal lobes divergent. Middle stem leaves smaller, cordate-reniform, shortly petiolate; sheath slightly enlarged, to 6 cm. Distalmost stem leaves sessile, broadly triangular; sheath enlarged. Synflorescence racemose, to 7 cm; leaflike bracts linear-lanceolate; peduncles 7–15 mm, shortly yellowish brown pilose. Capitula numerous. Involucral bracts 1–1.2 cm × 7–9 mm, outside glabrous; phyllaries 8 or 9, in 2 rows, lanceolate, 2–4 mm wide, margin membranous, apex acuminate. Florets yellow; lamina linear, 1.5–2 cm × 1.5–2.2 mm; tube 4–5 mm. Tubular florets 8–9 mm; tube 5–6 mm. Tubular florets usually 3, extending from involucre, 1–1.2 cm; tube as long as limb. Pappus yellowish brown, as long as tube of tubular corolla. Fl. Jul.–early Aug.

● Grassy slopes; 3400–3800 m. NW Yunnan.


Stem erect, 35–50(–75) cm tall, 3–4 mm in diam. at base, proximally glabrous, distally shortly yellowish brown pilose. Basal leaves petiolate; petiole 8–15 cm, base sheathed, abaxially glabrous, adaxially shortly pilose; leaf blade triangular-sagittate or cordate, 3–10.5 × 4.5–9 cm, both surfaces shortly white pilose, later adaxial hairs deciduous, glabrescent, palmately veined, margin regularly denticulate, apex acute; sinus ca. 1/3 as long as leaf blade, broad; basal lobes short, slightly divergent, outer margin coarsely dentate. Middle stem leaf sublanceolate, subsessile; sheath enlarged, 3–5 cm, margin entire; leaf blade ovate or ovate-cordate, 3–4 × 3.5–5 cm. Distalmost stem leaves sessile, bracteate, ovate-lanceolate. Synflorescence racemose, 7–13 cm; leaflike bracts linear, 1–1.5 cm, submembranous, shortly pilose, margin entire; peduncles 1.5–2.5 cm, shortly pilose. Capitula numerous; supplementary bracts linear. Involucral bracts 9–11 × 7–9 mm, outside shortly white pilose; phyllaries 7 or 8, in 2 rows, oblong or lanceolate, 2–3 mm wide, apex obtuse or acuminate; inner phyllaries brown membranous at margin. Ray florets 5 or 6, yellow; lamina linear, to 20 × 1.5 mm; tube 5–6 mm. Tubular florets 8–9 mm; tube as long as limb. Pappus yellowish brown, as long as tube of tubular corolla. Fl. Jul.–Sep.

● Grassy slopes; 3500–4200 m. NW and W Yunnan.


Stem erect, 30–130 cm tall, slender, 3–4 mm in diam. at base, glabrous. Basal leaves petiolate; petiole to 50 cm, glabrous, base sheathed; leaf blade ovate, 4.5–10 × 8–18 cm, glabrous or rarely shortly pilose on both surfaces, palmately veined, 4–7-palmatisect; lobes 3–7-divided, middle lobes duplicately 3-divided; segments marginally laciniate-dentate. Middle to distal stem leaves fewer, small, palmately divided, often with enlarged sheaths. Synflorescence racemose, 30–48(–60) cm; leaflike bracts linear-subulate; peduncles 3–4 mm, slender, glabrous. Capitula numerous (40–100); supplementary bracts often absent. Involucre narrowly cylindric, 7–11 × 2–3 mm, outside glabrous; phyllaries (3 or)4–6(or 7), in 2 rows, linear-oblong, ca. 2 mm wide, margin narrowly membranous, apex rounded, brown ciliate. Ray florets 2 or 3, yellow; lamina linear-oblong, to 17 × 2–3 mm, transparent, apex obtuse; tube 6–7 mm. Tubular florets usually 3, extending from involucre, 1–1.2 cm; tube as long as limb. Achenes brown, fusiform, 5–7 mm, attenuate at apex. Pappus purplish brown, ca. 4 mm, shorter than tube of tubular corolla. Fl. and fr. Jun.–Oct. 2n = 58*.

● Stream banks, grassy slopes, forest margins, forest understories, scrub; 1100–3700 m. Gansu, ?Henan, Jiangsu, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan.

*Ligularia przewalskii* is cultivated in Europe.


*掌叶橐吾 zhang ye tuo wu*


Stem erect, to 70 cm tall, ca. 3 mm in diam. at base, longitudinally angulate. Basal leaves petiolate; petiole 12–20 cm, glabrous, base sheathed; leaf blade abaxially pale green, adaxially green, cordate-orbicular, 7–24 × 8–25 cm, papery, abaxially glabrous, adaxially with sparse white glandular hairs, palmately dissected. Stem leaves 3 or 4; petiole 5–23 cm, base enlarged, sheathing; upper leaves with smaller blades and shorter petioles. Synflorescence racemose, to 25 cm, densely covered with rust-colored glandular hairs; peduncles 0.3–1.2(–8) cm. Capitula 7–15; supplementary bracts subulate. Involucre green, turbinate, 8–10 mm in diam.; phyllaries 3 or 9, in 2 rows, equal in length, broadly oblong, ca. 1 cm × 2–3 mm, apex acute. Ray florets yellow, 4 or 5; lamina lanceolate, 16–18 × 3 cm, apex acute and dentate; tube ca. 4 mm. Tubular florets 16–18; tube ca. 5 mm; limb campanulate, ca. 5 mm; lobes lanceolate, ca. 2 × 0.3 mm. Style ca. 12 mm; stigma brownish yellow. Achenes cylindric, ca. 5 × 0.6 mm, longitudinally ribbed, apex truncate. Pappus brown, 4–5 mm, as long as or shorter than tube of tubular corolla. Fl. Jul.–early Aug.

● Wet grassy slopes along forest margins, alpine meadows along streams; 2700–3400 m. NE Yunnan (Dongchuan, Qiaojia).

The population size is very small at two known localities, so *Ligularia qiaojiaensis* should be categorized as “endangered” (Dong & Chen, Nordic J. Bot. 28: 683. 2010).

One of us (Illarionova) believes that *Ligularia qiaojiaensis* is an
occasional hybrid of *L. przewalskii* and some species from the same section.


密花橐吾 mi hua tuo wu

Stem erect, 60–100 cm tall, 5–10 mm in diam. at base, rarely to 2 cm in diam., glabrous. Basal leaves petiolate; petiole 15–50 cm, glabrous, base sheathed; leaf blade ovate-cordate or reniform-cordate, 9.5–19 × 9–22 cm, both surfaces shortly pilose or abaxially hairy only along veins, palmately veined, margin irregularly dentate, apex triangular, obtuse; sinus ca. 1/3 as long as leaf blade, narrow; basal lobes 5–6 mm, coarsely dentate on outer margin, lowermost with larger teeth. Middle to distal stem leaves smaller, more narrowly petiolate; sheath narrower, margin entire. Synflorescence racemose, lax, 15–35 cm; leaflike bracts narrowly spatulate to linear-lanceolate, 1–1.7 cm × 2–4 mm, apex acute. Fruits 5–14, all tubular, extending from involucre, 1–1.2 cm; tube 5.5–7 mm. Pappus pale yellow, 4–5 mm, as long as tube of tubular corolla. Fl. Aug–Oct.

- Grassy slopes, forest understories; 3200–3300 m. NW Yunnan.


窄头橐吾 zhai tou tuo wu

Stem erect, 40–170 cm tall, 3–6 mm in diam. at base, rarely to 2 cm in diam., glabrous. Basal leaves petiolate; petiole 23–75 cm, slender, glabrous or apically arachnoid-puberulent, base narrowly sheathed; leaf blade ovate-cordate-hastate or reniform-hastate, rarely sagittate, 2.5–16.5 × 6–32 cm, glabrous or shortly pilose on both surfaces, abaxially sometimes hairy only along veins, palmately veined, base narrowly sheathed; leaf blade cordate-hastate, 3–82 cm × to 4 mm, outside glabrous; phyllaries 5 or 6, in 2 rows, oblong, 2–3 mm wide, apex acute. Florets 5–14, all tubular, extending from involucre, 1–1.2 cm; tube 5.5–7 mm. Pappus pale yellow, 4–5 mm, as long as tube of tubular corolla. Fl. and fr. Jul–Dec. 2

There are three different populations with differing involucre widths:

1) Narrow-involucre population: Plants large; leaves to 28.5 cm wide; involucre narrowly cylindric, 8–12 × 2–3 mm, phyllaries 5.

2) Broad-involucre population: Plants robust, taller; leaves to 32 cm wide; raceme to 90 cm; involucre broadly tubular, 17–18 × 5–8 mm, phyllaries 5(–7).

3) Mid-sized involucre population: between populations 1 and 2 in size, C, N, SW China. The plants of Xizang and Yunnan are the smallest.

1a. Leaves glabrous

1b. Leaves shortly pilose on both surfaces, tip of petiole arachnoid-puberulent

120a. Ligularia stenocephala var. stenocephala

窄头橐吾(原变种) zhai tou tuo wu (yuan bian zhong)


Leaves glabrous on both surfaces.

Stream banks, grassy slopes, forest understories, at base of rocks; 900–3300 m. Anhui, Guangdong, Guangxi, Hebei, Henan, Hubei, Jiangsu, Jiangxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, NW Yunnan, Zhejiang [Japan].

120b. Ligularia stenocephala var. scabrida

糙叶窄头橐吾 cao ye zhai tou tuo wu

Leaves shortly pilose on both surfaces, tip of petiole arachnoid-puberulent.

Grassy slopes, forest understories, on trees; 2000–3300 m. Guangxi, SW Sichuan, NW Yunnan [Japan].


太白山橐吾 tai bai shan tuo wu

Senecillis dolichobotrys (Diels) Kitamura.

Stem erect, 20–80 cm tall, 2–3 mm in diam. at base, glabrous. Basal leaves petiolate; petiole to 15 cm, slender, glabrous, base narrowly sheathed; leaf blade cordate-hastate, 3–11 × 7–14 cm, glabrous, abaxially sometimes hairy only along veins, palmately veined, margin irregularly dentate, apex
rarely broadly campanulate, base rounded; phyllaries in 2 rows, imb ricate, outer phyllaries narrow; inner phyllaries broad, oft en sheath. Capitula solitary or many in raceme, nodding; leaflike bracts linear, rarely broadly ovate or elliptic. Involucre hemispheric, compressed, apex obtuse or triangular, papillose-hairy. Achenes glabrous, ribbed. Pappus of denticulate hairs as long as or shorter
tacle flat, without scales. Outer florets female, radiate or rarely narrowly tubular; lamina well developed, diverse, usually several times as long as involucre, rarely absent. Central florets tubular, bisexual; limb 5-lobed. Anthers basally obtuse. Style branches compressed, apex obtuse or triangular, papilllose-hairy. Achenes glabrous, ribbed. Pappus of denticulate hairs as long as or shorter than tubular corolla, rarely absent.

About 69 species: Bhutan, China, India, Kashmir, Myanmar, Nepal, Pakistan; 69 species (46 endemic) in China.

1a. Leaves reniform or orbicular-reniform, cordate-reniform, or hastate, palmately or palmate-pinnately veined.

2a. Capitula without ray florets; phyllaries apically rounded or obtuse.

3a. Phyllaries petaloid, membranous, purplish red or rarely yellowish white, broadly elliptic or obovate-oblong, outside purplish red pilose, rarely white pilose, apex rounded.

3b. Phyllaries leathlike, herbaceous, dark brown, oblong or ob lanceolate, outside glabrous or pilose, apex obtuse.
5a. Phyllaries oblong, margin broadly brown membranous, apex entire; pappus shorter than tubular corolla; leaves glabrous, abaxially pale green, adaxially dark green .............................................. 3. C. calcicola
5b. Phyllaries usually oblanceolate, margin not membranous, apex denticulate or erose; pappus as long as tubular corolla; leaves concolorous on both surfaces.

6a. Sheaths of stem leaves tubular, outside glabrous; phyllaries black, base shortly pilose, outside glabrous; pappus white ................................................................. 4. C. atrocapitatum
6b. Sheaths of stem leaves cucullate, outside white arachnoid-puberulent; phyllaries outside glabrous; pappus yellowish brown ....................................................... 5. C. cucullatum

2b. Capitula with ray florets; phyllaries apically acute or acuminate.

7a. Ray lamina yellow, oblong to lanceolate, apex acuminate, rarely obtuse.
8a. Ray lamina oblong, apex acute or obtuse.
9a. Leaves glabrous, with conspicuous white reticulate veins on both surfaces or at least abaxially; involucre outside initially shortly pilose, glabrescent; ray lamina apically obtuse ......................... 6. C. smithianum
9b. Leaves abaxially brown pilose, without reticulate veins; involucre outside brown pilose; ray lamina apically acute .................................................................................. 7. C. decaisnei
8b. Ray lamina ovate- or linear-lanceolate, apex acuminate or cuneate.

10a. Ray lamina linear-lanceolate, membranous, transparent; pappus as long as tubular corolla; leaves angular dentate ............................................................. 8. C. stenoglossum
10b. Ray lamina ovate-lanceolate, not transparent; pappus shorter than to as long as tubular corolla; leaves crenate or coarsely dentate.

11a. Pappus brown, shorter than tubular corolla; leaves green on both surfaces, margin crenate .......... 9. C. citriflorum
11b. Pappus yellowish brown, as long as tubular corolla; leaves abaxially pale green, adaxially green, margin coarsely dentate ........................................................................ 10. C. pulchrum

7b. Ray lamina purplish red or yellow, broadly oblancoate or cuneate, apex truncate or rounded, 3-lobed, rarely 3-denticulate.

12a. Ray lamina purple; pappus white.
13a. Leaves palmatifid; tubular florets purplish red ........................................................................ 11. C. palmatum
13b. Leaf margin regularly crenate; tubular florets yellow or purplish red.

14a. Leaves abaxially densely white arachnoid-pilose; tubular florets yellow; styles proximally yellowish white, distally blackish gray, as long as tubular corolla ........................................ 12. C. farreri
14b. Leaves abaxially sparsely pilose; tubular florets purplish red, styles purplish red, 2–2.5 cm, longer than tubular corolla ............................................................................. 13. C. rhodocephalum

12b. Ray lamina yellow; pappus white or brown.

15a. Leaves cordate-reniform or hastate.

16a. Stem simple; leaves hastate, leaf margin usually entire or sparsely irregularly dentate; pappus as long as tubular corolla .............................................................. 18. C. forrestii
16b. Stems several; leaves cordate-reniform to hastate, leaf margin dentate; pappus shorter than tubular corolla.

17a. Leaves cordate-reniform; involucre ca. 20 mm; pappus brown, ca. 4 mm, much shorter than tubular corolla ....................................................................................... 19. C. medogense
17b. Leaves cordate-reniform to hastate; involucre 30–32 mm; pappus yellowish, 7–8 mm, slightly shorter than tubular corolla ............................................................................. 20. C. latilobum
15b. Leaves reniform or orbicular-reniform.

18a. Plants slender; leaves thin, margin angular dentate; ray lamina apically rounded, denticulate; pappus white ......................................................................................... 14. C. reniforme
18b. Plants robust; leaves thick, margin regularly dentate; ray lamina apically truncate, 3- or 4-lobed.

19a. Stem leaves with bulbil inside sheaths; pappus white ................................................................ 15. C. bulbilliferum
19b. Stem leaves without bulbil inside sheaths; pappus brown.

20a. Basal leaves glabrous; petiole glabrous or distally brown pilose; petiole of stem leaves enlarged into leaf blade, margin sharply dentate; pappus shorter than tubular corolla .......... 16. C. phyllodineum
20b. Basal leaves abaxially shortly black pilose along veins; petiole glabrous; petiole of stem leaves sheathlike, margin entire; pappus as long as tubular corolla ..................................... 17. C. thomsonii

1b. Leaves variable in shape, pinnately or parallel veined.

21a. Leaves bluish green or grayish green, linear to broadly elliptic, parallel or straight veined.
22a. Involucre outside densely brown or purplish brown pilose; leaves lanceolate to elliptic.
23a. Capitulum solitary, without ray florets .................................................................................. 21. C. angustifolium
23b. Capitula 1–13, in raceme or solitary, with ray florets; lamina membranous, transparent, linear-lanceolate, 25–70 × 1.5–5 mm, apex acuminata.
24a. Leaflike bracts linear to lanceolate, herbaceous, green ......................................................... 22. C. brunneopilosum
24b. Leaflike bracts ovate, membranous, yellowish white ............................................................. 23. C. stenactinium
22b. Involucre outside glabrous; leaves linear to oblanceolate.
25a. Ray lamina linear-lanceolate, to 4 cm, apex acuminate or absent; leaves linear to linear-lanceolate, usually 2–5 mm wide, rarely to 30 mm wide ................................................................. 24. C. lineare
25b. Ray lamina oblong, elliptic, or oblanceolate, 12–16 × 3–6 mm, apex obtuse or truncate; leaves oblong or oblanceolate to linear, 2–11 mm wide.
26a. Leaves linear, 2–3.5 mm wide, margin revolute, entire, apex rounded ........................................ 25. C. bhutanicum
26b. Leaves oblong or oblanceolate, 6–11 mm wide, margin remotely denticulate, apex acute ................................ 26. C. conaense
21b. Leaves green or differently colored on both surfaces, lanceolate to oblong, pinnately veined.
27a. Ray lamina broadly oblanceolate or cuneate, apex truncate, lobed.
28a. Leaves pinnatifidum to pinnatisect.
29a. Leaves ovate, lobes narrowly lanceolate, 10–30 × 1–4 mm; involucre glabrous .................................... 27. C. dissectum
29b. Leaves oblong, lobes oblong, 4–8 × ca. 1 mm; involucre blackish pilose ........................................ 28. C. pinnatifidum
28b. Leaf margin entire or dentate, rarely lobed.
30a. Leaves spatulate, margin triangularly dentate or denticulate, base truncate; pappus white; stem densely white pilose ....................................................................................................................... 29. C. sino-oblongatum
30b. Leaves hastate or ovate-cordate, margin entire to lobed or crenate, base cordate; pappus pale brown; stem glabrous ........................................................................................................... 30. C. trilobum
27b. Ray lamina elliptic or lanceolate to linear-lanceolate, apex acute or acuminate.
31a. Plants greenish gray or bluish green, glabrous, usually mealy; stem leaves numerous, erect, adnate, tubular-amplexicaul or only base amplexicaul.
32a. Leaflike bracts as leaf blade, usually surrounding involucre; ray lamina narrowly lanceolate, apex acuminate.
33a. Leaves ovate-elliptic to broadly elliptic, base cuneate ..................................................................... 31. C. helianthus
33b. Leaves narrowly elliptic or spatulate, base gradually narrowed ...................................................... 32. C. suave
32b. Leaflike bracts linear, not surrounding involucre.
34a. Capitulum 5–10, in raceme; ray lamina 5–7 mm, slightly longer than involucre; pappus pale yellow, 2–3 mm, ca. 1/2 as long as tubular corolla.
35a. Basal leaves broadly elliptic, base gradually narrowed into a narrowly winged petiole; stem leaves apically obtuse ......................................................................................................... 33. C. botryocephalum
35b. Basal leaves broadly spatulate-oblong, base gradually narrowed into a broadly winged petiole; stem leaves apically acuminate ................................................................. 34. C. spathulifolium
34b. Capitulum solitary; ray lamina longer than involucre; pappus white or pale yellow.
36a. Leaves petiolate; petiole 3–11 cm, slender; leaf blade oblong or elliptic, base rounded.
37a. Pappus white, as long as tubular corolla; ray lamina apically acuminate ........................................ 35. C. glaucum
37b. Pappus much shorter than tubular corolla or absent; ray lamina apically obtuse, acute, or acuminate.
38a. Pappus absent; ray lamina apically acuminate ........................................................................ 36. C. bupleurifolium
38b. Pappus pale yellow, 1–2 mm, 1/5–1/2 as long as tubular corolla; ray lamina apically acute or obtuse .................................................................................................................. 37. C. brachychaetum
36b. Leaves sessile or shortly petiolate; leaf blade ovate or lingulate-spatulate; ray lamina apically acuminate; pappus white, as long as tubular corolla.
39a. Leaves lingulate-spatulate, base gradually narrowed into a broad petiole ........................................ 38. C. lingulatum
39b. Leaves ovate or cordate, base cordate, narrowly petiolate.
40a. Leaves ovate; petiole glabrous ............................................................................................... 39. C. yadongense
40b. Leaves cordate; petiole brown pilose ...................................................................................... 40. C. cordatum
31b. Plants green, hairy, at least stem distally and involucre at base, rarely glabrous.
41a. Phyllaries in 1 row, equal in size, base united, cupular.
42a. Leaves 12–15 × 6–9 cm; petiole 15–30 cm; capitula 3, in corymb-raceme, long pedunculate; involucre outside black pilose; ray lamina linear-lanceolate ..................................................... 41. C. petiolatum
42b. Leaves 0.7–6 × 1–4 cm, shortly petiolate; capitulum solitary; involucre outside black or white pilose; ray lamina oblong.
43a. Ray lamina as long as involucre or tubular florets; phyllaries apically rounded; leaves abaxially white pilose.
44a. Outer florets radiate; lamina yellow, as long as involucre ................................................................ 42. C. nanum
44b. Outer florets radiate or narrowly tubular, as long as tubular florets in center; lamina white, smaller or absent; slender tubular florets with short corolla ........................................ 43. C. microglossum
43b. Ray lamina longer than involucre; phyllaries apically acute or acuminate; leaves glabrous or abaxially pilose.
45a. Plants with rosette leaves; underground stems absent; leaves glabrous, margin revolute .... 44. C. microphyllum
45b. Plants without rosette leaves; leaves all stem, abaxially densely white pilose, adaxially
    glabrous; underground stem rhizomelike, with scale leaves.
46a. Leaf margin entire to shallowly dentate ................................................................. 45. C. humile
46b. Leaf margin pinnately laciniate; segments linear-oblong ...................................... 46. C. laciniatum
47a. Ray florets absent; involucre outside densely dark brown pilose; leaves abaxially greenish
    white, adaxially dark green, margin entire ......................................................... 47. C. discoideum
47b. Ray florets present, if ray florets absent or with short lamina then involucre outside blackish
    gray pilose; leaf margin coarsely dentate.
48a. Capitula large; ray lamina tapelike, narrowly lanceolate to linear-lanceolate, usually 2–4 × as
    long as involucre, apex acuminate.
49a. Leaves densely hairy, oblong, obovate to orbicular; involucre outside white and black pilose.
50a. Leaves densely white pilose, base narrowed into a broadly winged petiole; capitula 1–4, 
    solitary or in corymb-raceme ........................................................................... 48. C. obovatum
50b. Leaves densely shortly white pilose, base rounded, narrowly petiolate; capitulum solitary ..... 49. C. puberulum
49b. Leaves glabrous, variable in shape; involucre outside blackish purple-brown or white
    pilose, rarely glabrous.
51a. Leaf base cordate or truncate.
52a. Leaves ovate, base cordate, margin entire; ray lamina linear-lanceolate, 2–5 mm wide; 
    pappus white ........................................................................................................ 50. C. prattii
52b. Leaves triangular or sagittate, margin dentate; ray lamina broadly lanceolate, 6–9 mm wide; 
    pappus pale brown.
53a. Leaves concolorous on both surfaces, triangular, 6–13 cm, base truncate .................. 51. C. delavayi
53b. Leaves abaxially pale green, adaxially dark green, sagittate, 1.5–3 cm, base cordate .... 52. C. sagittifolium
51b. Leaf base cuneate.
54a. Involucre outside purplish red or white pilose; stem glabrous; leaves abaxially pale
    green, adaxially green, broadly lanceolate, margin coarsely dentate ................. 53. C. daochengense
54b. Involucre outside brown or dark brown pilose; stem shortly black pilose; leaves
    glabrous or yellow pilose, obovate or broadly elliptic, margin subtentire or denticulate.
55a. Leaves glabrous, margin subtentire .......................................................................... 54. C. nobile
55b. Leaves yellow pilose, margin denticulate or subtentire ............................................ 55. C. pilosum
51b. Leaf base cuneate.
52a. Leaves ovate, base cordate, margin entire; ray lamina linear-lanceolate, 2–5 mm wide; 
    pappus white ........................................................................................................ 50. C. prattii
52b. Leaves triangular or sagittate, margin dentate; ray lamina broadly lanceolate, 6–9 mm wide; 
    pappus pale brown.
53a. Leaves concolorous on both surfaces, triangular, 6–13 cm, base truncate .................. 51. C. delavayi
53b. Leaves abaxially pale green, adaxially dark green, sagittate, 1.5–3 cm, base cordate .... 52. C. sagittifolium
51b. Leaf base cuneate.
54a. Involucre outside purplish red or white pilose; stem glabrous; leaves abaxially pale
    green, adaxially green, broadly lanceolate, margin coarsely dentate ...................... 53. C. daochengense
54b. Involucre outside brown or dark brown pilose; stem shortly black pilose; leaves
    glabrous or yellow pilose, obovate or broadly elliptic, margin subtentire or denticulate.
55a. Leaves glabrous, margin subtentire .......................................................................... 54. C. nobile
55b. Leaves yellow pilose, margin denticulate or subtentire ............................................ 55. C. pilosum
48b. Capitula small; ray lamina oblong, elliptic to linear, often 1–2 × as long as involucre.
56a. Capitula 2–13, in raceme; stem leaves normal; plants robust, tall.
57a. Involucre outside black pilose; ray lamina broadly elliptic; stem leaves ovate ............. 56. C. arnicoides
57b. Involucre outside white pilose; ray lamina oblong; stem leaves oblong or obv-oblong.
58a. Leaves herbaceous, white arachnoid-puberulent, scarcely veined; stem leaves with 
    sheath amplexicaul; peduncles equal, to 1 cm; raceme not spreading ................. 57. C. chungdienense
58b. Leaves leathery, glabrous, prominently veined; stem leaves not amplexicaul; peduncles 
    unequal, 2–6 cm; raceme spreading ................................................................. 58. C. coriaceum
56b. Capitulum solitary, rarely 3; stem leaves bracteal, obov-oblong to linear; plants dwarf.
59a. Pappus brown; leaf base cordate.
60a. Basal leaves ovate-cordate or ovate-lanceolate to lanceolate; involucre broadly 
    campanulate; ray lamina linear ................................................................. 59. C. potaninii
60b. Basal leaves ovate-cordate to orbicular-cordate or squarelike; involucre hemispheric; 
    ray lamina oblong.
61a. Leaves small, leathery, nitid, conspicuously reticulate veined ............................ 60. C. cyclaminanthum
61b. Leaves large, herbaceous, scarcely reticulate veined, abaxially glabrous or brown 
    pilose along veins ......................................................................................... 61. C. principis
59b. Pappus white; leaf base usually cuneate, truncate, or rounded, if base cordate then involucre 
    outside shortly black pilose.
62a. Involucre outside shortly black pilose or glabrous; leaf base cordate or rounded; ray lamina 
    slightly longer than involucre.
63a. Leaves thin, often purplish red, scarcely reticulate veined ................................. 62. C. purpureifolium
63b. Leaves thick, green, conspicuously prominently reticulate veined.
64a. Basal leaves reticulate veined on both surfaces; capitula sometimes 3; ray lamina 
    broadly elliptic ............................................................................................. 63. C. nervosum
64b. Basal leaves abaxially reticulate veined; capitulum solitary; ray lamina oblong .......... 64. C. nepalense
62b. Involucre outside white or blackish gray pilose, rarely glabrous; leaf base usually cuneate, rarely truncate.

65a. Basal leaves narrowly petiolate; petiole densely pilose, not winged; stem leaves numerous, linear, erect, margin entire; involucre outside glabrous; ray lamina slightly longer than involucre, apex truncate ................................................. 65. C. varifolium

65b. Basal leaves broadly petiolate; petiole winged, glabrous or hairy, sometimes enlarged into a leaflike blade; stem leaves ovate-oblong to lanceolate, margin dentate; ray lamina 2–3 × as long as involucre, apex acute. 66a. Involucre outside glabrous, phyllaries narrowly lanceolate, apex acuminate ... 66. C. pseudo-oblongatum

66b. Involucre outside densely hairy, phyllaries lanceolate or ovate-lanceolate, apex acute or obtuse.

67a. Involucre outside white arachnoid-puberulent ......................................................... 67. C. oblongatum

67b. Involucre outside blackish gray pilose.

68a. Leaves and petiole glabrous .................................................................................... 68b. Leaves and petiole densely glandular pilose ..................................................... 69. C. glandulipilosum


钟花垂头菊 zhong hua chui tou ju

Stems solitary, rarely 2, erect, purplish red, 10–30 cm tall, 2–3 cm in diam., proximally glabrous, distally purple pilose. Basal leaves petiolate; petiole 6–12 cm, purple pilose, base sheathed; leaf blade reniform, 0.7–2.5 × 1–5 cm, glabrous, sometimes abaxially purple, pilose, margin purple pilose, shallowly crenate or lobed; lobes 7–12, with white prominent pal- mate veins on both surfaces. Middle stem leaves shortly petiolate, base sheathed; leaf blade smaller, reniform. Distal stem leaves ovate or lanceolate, margin sharply dentate, without sheaths. Capitulum solitary, nodding. Involucre campanulate, 1.5–2.8 × 1.5–4.5 cm, outside blackish purple pilose or gla- sheaths. Capitulum solitary, nodding. Involucre campanulate, 1.2–1.7 × 1.5–3.5 cm, outside purple pilose, sometimes sub- involucral, linear, margin entire. Capitulum solitary, nodding. Involucre campanulate, 1.2–1.7 × 1.5–3.5 cm, outside purple pilose, sometimes sub- involucral, linear, margin entire. Capitulum solitary, nodding. Involucre campanulate, 1.2–1.7 × 1.5–3.5 cm, outside purple pilose, sometimes sub- involucral, linear, margin entire. Capitulum solitary, nodding. Involucre campanulate, 1.2–1.7 × 1.5–3.5 cm, outside purple pilose, sometimes sub- involucral, linear, margin entire. Capitulum solitary, nodding. Involucre campanulate, 1.2–1.7 × 1.5–3.5 cm, outside purple pilose, sometimes sub- involucral, linear, margin entire. Capitulum solitary, nodding. Involucre campanulate, 1.2–1.7 × 1.5–3.5 cm, outside purple pilose, sometimes sub- involucral, linear, margin entire. Capitulum solitary, nodding. Involucre campanulate, 1.2–1.7 × 1.5–3.5 cm, outside purple pilose, sometimes sub- involucral, linear, margin entire. Capitulum solitary, nodding. Involucre campanulate, 1.2–1.7 × 1.5–3.5 cm, outside purple pilose, sometimes sub- involucral, linear, margin entire. Capitulum solitary, nodding. Involucre campanulate, 1.2–1.7 × 1.5–3.5 cm, outside purple pilose, sometimes sub- involucral, linear, margin entire. Capitulum solitary, nodding. Involucre campanulate, 1.2–1.7 × 1.5–3.5 cm, outside purple pilose, sometimes sub- involucral, linear, margin entire. Capitulum solitary, nodding. Involucre campanulate, 1.2–1.7 × 1.5–3.5 cm, outside purple pilose, sometimes sub-

1a. Phyllaries yellowish white, outside long white pilose ........................................... 1c. var. flavidum

1b. Phyllaries purplish red.

2a. Leaves abaxially shortly pilose; phyllaries outside shortly black pilose; pappus brown, much shorter than tubular corolla .... 1b. var. brachytrichum

2b. Leaves glabrous; phyllaries outside blackish purple pilose or glabrous; pappus white, as long as corolla ...................... 1a. var. campanulatum

1a. Cremanthodium campanulatum var. campanulatum

钟花垂头菊(原变种) zhong hua chui tou ju (yuan bian zhong)


Leaves glabrous. Phyllaries purplish red, outside glabrous. Pappus white, as long as tubular corolla.

Forest understories, forest margins, grassy slopes, scrub, alpine meadows, gravelly areas on mountains; 3200–4800 m. SW and W Sichuan, SE Xizang, NW Yunnan [NE Myanmar].


短毛钟花垂头菊 duan mao zhong hua chui tou ju

Leaves abaxially shortly pilose. Phyllaries purplish red, outside shortly black pilose. Pappus brown, much shorter than tubular corolla.

- Gravelly areas on mountains; ca. 4300 m. W Yunnan.


黄苞钟花垂头菊 huang bao zhong hua chui tou ju

Leaves glabrous. Phyllaries yellowish white, outside long white pilose. Pappus white, as long as tubular corolla.

- Gravelly areas on mountains; 3800–4500 m. Sichuan (Muli).


裂叶垂头菊 lie ye chui tou ju


Stem solitary, erect, 6–13 cm tall, yellowish brown pilose. Basal leaves petiolate; petiole 2–5 cm; leaf blade sub-reniform, 1.5–4 × 2–4.5 cm, glabrous, 2-ternate-palmatisect or sometimes pinnatisect; lobes lanceolate, 4–6 mm, apex acute, mucronate. Middle stem leaves smaller, pinnatisect. Distal stem leaves linear, margin entire or dentate. Distalmost stem leaves bracteal, linear, margin entire. Capitulum solitary, nodding. Involucre campanulate, 1.2–1.7 × 1.5–3.5 cm, outside purple pilose; phyllaries 8–12, in 2 rows, blackish purple, petaloid, ob-
long or suborbicular, 5–15 mm, submembranous, apex rounded or obtuse. Florets numerous, all tubular, purple, ca. 6 mm; tube ca. 1.5 mm; limb narrowly cylindric. Pappus pale brown, as long as tubular corolla. Fl. Jul–Aug, fr. Aug–Sep.

Grassy slopes; ca. 4200 m. SE Xizang, NW Yunnan [NE Myanmar].


长鞘垂头菊 chang qiao chui tou ju

Stem solitary, erect, 20–50 cm tall, to 7 mm in diam. at base, proximally glabrous, distalmost shortly yellowish brown pilose. Basal leaves petiolar; petiole 5–13 cm, to 5 mm wide, base sheathed; sheath 6–9 cm, submembranous, not split and fimbriiform when dry; leaf blade abaxially green, adaxially dark green, orbicular-reniform or reniform, 6–8 cm in diam., palmately veined, abaxially with prominent veins, glabrous, margin regularly crenate, apex of teeth mucronate; sinus narrow. Stem leaves 1 or 2; middle leaves reniform, petiolar, base sheathed; distal leaves sessile, bracteal, ovate-oblong, without sheath. Capitulum solitary, nodding. Involucre hemispheric, 1.1–1.3 × 2.5–3 cm, outside blackish purple, glabrous; phyllaries 20, in 2 rows, oblanceolate, 2–5 mm wide, margin entire, apex obtuse or acute; inner phyllaries broadly membranous at margin. Florets numerous, all tubular, yellow, 5–6 mm; tube 1.5–2 mm; limb campanulate. Achenes brown, obovoid, 3–4 mm. Pappus yellowish brown, as long as tubular corolla. Fl. and fr. Aug.

● Grassy slopes; ca. 3500 m. W Yunnan.


黑垂头菊 hei chui tou ju

Stem solitary, erect, 15–35 cm tall, proximally glabrous, distally black pilose. Basal leaves petiolar; petiole 10–13 cm, glabrous, sheath amplexicaul; leaf blade reniform, 3–5 × 3.5–9 cm, glabrous, abaxially with conspicuous palmate veins, margin regularly triangular-denticulate; sinus slightly broad. Stem leaf solitary, bracteal, ovate, ca. 1.5 cm, base enlarged sheathed; sheath to 6 × 1–2 cm, amplexicaul. Capitulum solitary, nodding. Involucre dark purple or black, hemispheric, 1 × 1 cm, outside blackish purple, glabrous; phyllaries 10, in 2 rows, oblanceolate, 2–5 mm wide, margin entire, apex obtuse or acute;

Grassy slopes, stream banks, calcitic cliffs; 3400–3500 m. NW Yunnan.


兜鞘垂头菊 dou qiao chui tou ju

Stem solitary, erect, 20–25 cm tall, 1.5–2 mm in diam. at base, white arachnoid-pilose, distally intermixed yellowish brown pilose. Basal leaves petiolar; petiole to 8 cm, hairy, sheath amplexicaul; leaf blade reniform, 1–1.5 × 1.5–2.7 cm, both surfaces white arachnoid-pilose or adaxially glabrescent, palmately veined, margin regularly denticulate, apex rounded. Stem leaves 2 or 3, smaller distally. Middle stem leaves reniform; petiole enlarged into a cucullate sheath, white arachnoid-puberulent, amplexicaul. Distal stem leaves bracteal, lanceolate to linear. Capitulum solitary, nodding. Involucre hemispheric, 0.9–1 × ca. 2 cm, outside dark brown, glabrous, base hairy; phyllaries 12–24, in 2 rows, oblong-campanulate, 2.4–4 mm wide, apex erose. Florets numerous, all tubular, yellow, 5–6 mm; tube 1.5–2 mm; limb campanulate. Achenes brown, obovoid, 3–4 mm. Pappus yellowish brown, as long as tubular corolla. Fl. and fr. Aug.

● Grassy slopes; ca. 3500 m. W Yunnan.


紫茎垂头菊 zi jing chui tou ju


Stem solitary, erect, 10–25 cm tall, ca. 3 mm in diam. at base, proximally glabrous, distally shortly white and brown pilose. Basal leaves long petiolar; petiole purplish red, 2–15 cm, base sheathed, distally shortly purplish red pilose or glabrous; leaf blade purplish red, reniform, 0.5–5 × 1.2–7 cm, glabrous, abaxially rarely initially shortly pilose, palmately veined, white prominent reticulate veins on both surfaces, margin regularly denticulate, apex rounded or retuse. Middle to distal stem leaves 1 or 2, smaller, shortly petiolar or sessile, reniform to linear-lanceolate. Capitulum solitary, nodding or suberect. Involucre hemispheric, 0.8–1.6 × 1.5–2.5 cm, outside initially shortly pilose, glabrescent; phyllaries 12–14, in 2 rows, outer phyllaries lanceolate, apex acute or acuminata; inner phyllaries oblong or narrowly oblong-campanulate, to 5 mm wide, margin broadly membranous, apex acute or obtuse. Ray florets yellow; lamina oblong, 1–2 cm × 3–5 mm, apex obtuse, entire or lobed; tube ca. 1 mm. Tubular florets numerous, yellow; 6–9 mm; tube ca. 2 mm; limb cylindrical. Achenes oblong-campanulate, ca. 4 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Sep.

Grassy slopes, stream banks, gravelly areas on mountains, alpine meadows; 3000–5200 m. SW Sichuan, SE Xizang, NW Yunnan [NE Myanmar].

7. Cremanthodium decaisnei C. B. Clarke, Compos. Ind. 168. 1876.

喜马拉雅垂头菊 xi ma la ya chui tou ju

Cremanthodium decaisnei f. clarkei R. D. Good; C. decaisnei f. sinense R. D. Good; Senecio renatus Franchet.

Stem solitary, erect, 6–25 cm tall, 1.5–3 mm in diam. at base, proximally glabrous, distally densely brown pilose. Basal leaves long petiolar; petiole 3–14 cm, glabrous, base narrowly sheathed; leaf blade reniform or orbicular-reniform, 0.5–4.5 × 0.9–5 cm, abaxially densely brown pilose, rarely glabrescent,
adaxially glabrous, palmately veined, margin irregularly shallowly crenate, rarely lobed, apex rounded. Middle to distal stem leaves 1 or 2, petiolate or sessile, smaller, with leaf blade or not. Capitulum solitary, nodding. Involucre hemispheric or rarely campanulate, 0.7–1.5 × 1–2 cm, outside densely brown pilose or sometimes glabrescent; phyllaries 8–12, in 2 rows, apex acuminate, mucronate; outer phyllaries narrowly lanceolate; inner phyllaries oblong-lanceolate, margin broadly membranous. Ray florets yellow; lamina narrowly elliptic or oblong, 1–2 cm × 3–6 mm, apex acute, rarely acuminate, 3-denticulate. Tubular florets numerous, dark yellow, 5–7 mm; tube 1–2 mm. Achenes 6 mm, apex acute, rarely acuminate, 3-denticulate. Tubular florets numerous, yellow; lamina narrowly elliptic or oblong, 3–7 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Sep.

Grassy slopes, gravelly areas on mountains, alpine meadows; 3500–5400 m. SW Gansu, SW Qinghai, SW Sichuan, Xizang, NW Yunnan [Bhutan, India (Sikkim), Kashmir, Nepal].


狭舌垂头菊  xia she chui tou ju

Stem solitary, erect, scapelike, 10–32 cm tall, 1.5–3 mm in diam. at base, proximally glabrous, distally white floccose and shortly brown pilose. Basal leaves petiolate; petiole glabrous, 2.6–11.5 cm, base enlarged sheathed; leaf blade orbicular-reform or reniform, 0.7–2 × 1.5–4 cm, glabrous, palmately veined, margin angular-dentate, white pilose; sinus narrow, basal lobes convergent, subsucculent. Proximal stem leaf solitary, shortly petiolate or sessile, smaller, broadly reniform, base sheathed, margin coarsely triangular or orbicular-dentate. Middle to distal stem leaves absent or bracteal and oblong. Capitulum solitary, nodding. Involucre hemispheric, 1.3–1.6 × 2 cm, outside glabrous; phyllaries 9–14, in 2 rows, purple; outer phyllaries narrowly lanceolate, 1.5–2.5 mm wide; inner phyllaries oblong, 3.5 mm wide, margin brown ciliate, apex acuminate or acute, mucronate. Ray florets yellow; lamina linear-lanceolate, 2.5–3.5 cm, at 5 mm wide at base, membranous, transparent, with 6 or 7 brown veins, apex long acuminate, 3-lobe. Tubular florets numerous, yellow, 7–9 mm; tube 3 cm; limb 2–2.5 mm wide. Achenes cylindric, ca. 7 mm, ribbed. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Aug. 2n = 58.

• Swamps, stream banks, scrub, alpine meadows, alpine crevices, gravelly areas on mountains; 3700–4000 m. W Qinghai, NW Sichuan.


柠檬色垂头菊  nin meng se chui tou ju

Stem solitary, erect, 25–42 cm tall, ca. 4 mm in diam. at base, proximally glabrous, distally white arachnoid-pilose. Basal leaves petiolate; petiole ca. 11.5 cm, glabrous, base enlarged sheathed; sheath to 6 cm; leaf blade green on both surfaces, reniform, ca. 5 × to 6 cm, glabrous, palmately veined, margin minutely crenate and ciliate, apex rounded; sinus broad. Middle to distal stem leaves only enlarged sheathed; sheath 4–7 × to 4 cm, glabrous, margin obtusely dentate. Capitulum solitary, nodding. Involucre black when dry, hemispheric, ca. 2 × to 2.5 cm, outside glabrous, base pilose; phyllaries 12, in 2 rows, purple, apex obtuse or acute; outer phyllaries lanceolate or oblong, 4–6 mm wide; inner phyllaries broadly elliptic, 7–10 mm, margin broadly membranous. Ray florets yellow or lemon-colored; lamina ovate-lanceolate, 4–5 cm, base to 1 cm wide, with brown veins, apex ciliate-acuminate, 3-lobe; tube 4–5 mm. Tubular florets numerous, yellowish brown, 8–10 mm; tube ca. 2 mm; limb campanulate-tubular, ca. 3 mm wide. Achenes fusiform, 6–7 mm, narrowed at both ends, ribbed. Pappus brown, shorter than tubular corolla. Fl. and fr. Aug.

Alpine meadows; 3600–4000 m. NW Yunnan [Myanmar].


美丽垂头菊 mei li chui tou ju

Stem solitary, erect, 15–40 cm tall, slender, ca. 2 mm in diam. at base, proximally glabrous, distally white and brown pilose. Basal leaves petiolate; petiole 8–12 cm, slender, glabrous, base enlarged sheathed; leaf blade abaxially pale green, adaxially green, reniform or ovate-cordate, 1.2–2 × 2.7–3 cm, glabrous, palmately veined, with conspicuous reticulate veins, margin coarsely triangular or orbicular-dentate, apex rounded or subrounded. Middle to distal stem leaf solitary, bracteal, ovate-lanceolate, ca. 1.5 cm. Capitulum solitary, nodding. Involucre hemispheric, ca. 1 × to 1.5 cm, outside initially white and brown pilose, glabrescent; phyllaries 10–12, in 2 rows, blackish purple, oblong or elliptic, 3–5 mm wide, apex obtuse or acute; inner phyllaries broadly membranous at margin. Ray florets yellow; lamina ovate-lanceolate, to 2.5 cm, at 7 mm wide at base, apex acuminate, 3-lobe. Tubular florets numerous, 4–5 mm; tube ca. 1 mm; limb funnelforn, ca. 2.5 mm wide. Achenes (immature) obovoid, ca. 2 mm. Pappus initially white, later yellowish brown, as long as tubular corolla. Fl. Jul–Sep. fr. Aug–Sep.

Grassy slopes, stream banks; ca. 4000 m. NW Yunnan [Myanmar].


掌叶垂头菊 zhang ye chui tou ju

Cremanthodium palmatum var. benthamianum R. D. Good; Scenecio benthamianus Franchet.

Stem solitary, erect, to 25 cm tall, proximally glabrous, distally purplish brown pilose. Basal leaves long petiolate, reniform, 1.3–2.5 cm in diam., palmately veined, palmatifid; lobes 6–12, oblong, glabrous or abaxially sparsely purplish red pilose, very rarely purplish brown pilose on both surfaces, apex mucronate. Middle to distal stem leaves petiolate or sessile, reniform to linear. Capitulum solitary, nodding. Involucre hemispheric, 3.8–6.3 cm in diam., outside glabrous, base blackish purple pilose; phyllaries in 2 rows, oblong or lanceolate, ca. 1.5 cm, margin membranous, apex obtuse. Ray florets purplish red; lamina broadly oblong-lanceolate, apex subtruncate, 2–4-lobe; tube shorter. Tubular florets numerous, purplish red. Achenes short. Pappus white, as long as tubular corolla. Fl. and fr. Jun–Sep.

Alpine meadows, gravelly areas on mountains; 3000–4000 m. S Xizang [Bhutan, India (Sikkim)].

红花垂头菊 hong hua chui tou ju

Stem solitary, erect, 30–47 cm tall, 3–4 mm in diam. at base, densely initially white arachnoid-puberulent, proximally glabrescent. Basal leaves petiolate; petiole to 21 cm, slender, white arachnoid-puberulent, base sheathed; leaf blade reniform, 1.5–3.5 × 2.5–6 cm, abaxially white arachnoid-pilose, adaxially glabrous, palmately veined, abaxially with prominent veins, margin regularly shallowly crenate, tips of teeth mucronate, apex rounded. Middle stem leaves smaller, reniform; petiole enlarged into a leaf blade, abaxially white arachnoid-puberulent, base cordate, semiamplexical, margin denticate. Distal stem leaves sessile, broadly ovate, base semiamplexical, margin dentate. Capitulum solitary, nodding. Involucre hemispheric, 1.5–2 × 3–4 cm, outside blackish purple, glabrous; phyllaries 12–14, in 2 rows, 3–4 mm wide, apex acute, mucronate and white ciliate; outer phyllaries lanceolate; inner phyllaries ovate-lanceolate or elliptic, margin broadly membranous. Ray florets purplish red; lamina oblong, 2.5–3 × ca. 1 cm, apex obtuse, denteicate; tube ca. 1.5 mm. Tubular florets numerous, yellow, ca. 8 mm; tube ca. 1 mm; limb campanulate-cylindric; styles slightly extending from corolla, proximally yellowish white, distally blackish gray. Achenes yellowish brown, cuneate, 4–6 mm, ribbed. Pappus white, as long as tubular corolla. Fl. and fr. Aug.–Sep.

Alpine meadows, gravelly slopes; 4000–4600 m. W Yunnan [Myanmar].


长柱垂头菊 chang zhu chui tou ju

Cremanthodium gracillimum W. W. Smith; C. palmatum Bentham var. rhodocephalum (Diels) R. D. Good; C. sherriffii H. R. Fletcher.

Stem solitary, erect, 8–33 cm tall, densely purplish red pilose. Stem leaves crowded in middle to proximal part of stem, petiolate; petiole 2–12 cm, pilose, semiamplexical; leaf blade abaxially purplish red, adaxially green, reniform, 0.7–4 × 1–6 cm, abaxially sparsely white pilose, adaxially glabrous, palmately veined, with prominent veins on both surfaces, margin regularly crenate, tips of teeth mucronate. Middle to distal stem leaves shortly petiolate, without sheath; leaf blade orbicular-reniform to linear, margin dentate or entire. Capitula solitary or few, on apex of stem or branches, nodding. Involucre hemispheric, 1–1.5 × 1.5–3 cm, outside long purplish red pilose; phyllaries 10–16, in 2 rows, oblong-lanceolate, 3–5 mm wide, apex acute or acuminate; inner phyllaries broadly white membranous at margin. Ray florets purplish red; lamina oblongo-lanceolate, 1.5–2 cm × 5–8 mm, apex rounded or truncate, 2–3-lobed; tube ca. 5 mm; styles purplish red, to 3 cm. Tubular florets numerous, purplish red, 1–1.2 cm; tube ca. 1.5 mm; limb cylindrical; styles purplish red, 2–2.5 cm. Achenes oblong, ca. 5 mm. Pappus white, slightly shorter than tubular corolla. Fl. and fr. Jun.–Sep.

● Alpine meadows, grassy slopes, forest margins, gravelly areas on mountains; 3000–5000 m. SW Sichuan, SE Xizang, NW Yunnan.


肾叶垂头菊 shen ye chui tou ju

Ligularia reniformis Candolle, Prodr. 6: 315. 1838.

Stem solitary, erect, 30–40 cm tall, ca. 3 mm in diam. at base, proximally glabrous, distally purplish brown pilose. Basal leaves petiolate; petiole 6–17 cm, slender, glabrous, base sheathed; leaf blade reniform, orbicular-reniform, or cordate-reniform, 2–3.5 × 2.5–7 cm, thin, soft, glabrous, palmate veins prominent abaxially, margin angular-dentate and ciliate, apex rounded. Stem leaves 1 or 2, smaller, proximal leaves shortly petiolate, base enlarged sheathed; leaf blade reniform, distal ones with only sheath. Capitulum solitary, nodding. Involucre hemispheric, 1.5–2 × 2–2.5 cm, outside black pilose; phyllaries 10–12, in 2 rows, 4–6 mm wide, apex acute; outer phyllaries lanceolate; inner phyllaries oblong, margin membranous. Ray florets yellow; lamina oblate-oblong, 0.5–1.2 cm × 4–8 mm, apex rounded, denteicate; tube ca. 1 mm. Tubular florets numerous, deep yellow, 6–7 mm; tube ca. 1 mm; limb campanulate. Achenes brown, cuneate, 4–5 mm. Pappus white, slightly shorter than corolla. Fl. and fr. Aug.–Oct.

Alpine meadows, forest margins; 3300–4500 m. S Xizang, NW Yunnan [Bhutan, India (Sikkim), Nepal].


珠芽垂头菊 zhua ya chui tou ju

Stems 1 or 2, erect, 8–25 cm tall, ca. 3 mm in diam. at base, proximally glabrous, often purplish red, distally shortly black pilose. Basal leaves long petiolate; petiole 4–10 cm, glabrous, base sheathed; leaf blade abaxially purple, reniform or broadly reniform, 1.25 × 1.2–5 cm, glabrous, palmate veins prominent abaxially, margin shallowly crenate, apex rounded or retuse. Stem leaves 3 or 4, reniform, smaller distally, distalmost stem leaves with only sheath; sheath cuculate, inside with bulbil, black, ovate, ca. 4 mm. Capitulum solitary, nodding or semierect. Involucre hemispheric, 1–1.5 × 1.5–2 cm, outside dark brown pilose; phyllaries in 2 rows, oblong or linear-oblong, apex acute; inner phyllaries broader, 3–5 mm wide, margin broadly membranous. Ray florets yellow; lamina oblate-oblong, 1.2–1.8 cm × 3–5 mm, apex truncate, 3- or 4-lobed; tube ca. 4 mm. Tubular florets numerous, yellow, ca. 8 mm; tube ca. 2 mm; limb cylindrical. Achenes oblong, ca. 3 mm. Pappus white, as long as tubular corolla. Fl. and fr. Aug.–Oct.

● Grassy slopes, rocky slopes; 3000–4000 m. SE Xizang, NW Yunnan.


叶状柄垂头菊 ye zhuang bing chui tou ju

Stem solitary, erect, 35–60 cm tall, 2–4 mm in diam. at base, proximally glabrous, distally dark brown pilose. Basal leaves long petiolate; petiole 10–24 cm, base sheathed, glabrous or distally brown pilose; leaf blade reniform or triangular-reniform, 3.5–7 × 4–8.5 cm, glabrous, palmate veins prominent abaxially, margin regularly crenate or coarsely dentate, apex
rounded. Stem leaves 1–3, proximal to middle leaves petiolate, proximal part of petiole enlarged into a blade, thus whole leaf dumbbell-shaped and larger than distal stem leaves, margin irregularly sharply dentate. Distal stem leaves ovate, lobed. Capitulum solitary, nodding. involucre hemispheric, 1–1.5 × 2.5–3 cm, outside black pilose; phyllaries 12, in 2 rows, 3–7 mm wide, apex acute, ciliate; outer phyllaries lanceolate; inner phyllaries ovate, margin broadly membranous. Ray florets yellow; lamina broadly obovate, 2.2–2.5 cm × 8–10 mm, apex truncate, 3- or 4-lobed; tube ca. 1 mm. Tubular florets numerous, 7–8 mm, apex brown; tube ca. 1.5 mm; limb narrowly cylindric. Achenes (immature) 2–3 mm. Pappus pale brown, shorter than tubular corolla. Fl. Jul.–Aug.

- Alpine meadows, wet grassy slopes; 3700–4200 m. SE Xizang, NW Yunnan.

17. Cremanthodium thomsonii C. B. Clarke, Compos. Ind. 169. 1876.

叉舌垂头菊  cha she chui tou ju

Senecio nepheletagus Franchet.

Stem solitary, erect, 25–50 cm tall, ca. 3 mm in diam. at base, proximally glabrous, distally dark brown pilose. Basal leaves long petiolate; petiole 10–15 cm, glabrous, base narrowly sheathed; leaf blade reniform or orbicular-reniform, 2–4 × 3–5.5 cm, abaxially sparsely shortly black pilose along veins, adaxially glabrous, palmate veins prominent abaxially, margin shallowly crenate or coarsely dentate. Middle stem leaf solitary, petiolate; petiolar base with entire sheath; leaf blade smaller, reniform. Distal stem leaves 1 or 2, sessile, linear-lanceolate, margin entire. Capitulum solitary, nodding. involucres hemispheric, 1–1.5 × 1.5–2.5 cm, outside brown pilose or glabrous; phyllaries 10–14, in 2 rows, 3–7 mm wide, apex acute; outer phyllaries narrower, lanceolate, 3–4 mm wide; inner phyllaries broader, oblong, 4–6 mm wide, margin brown membranous. Ray florets yellow; lamina broadly obovate or cuneate, 1.6–2.3 cm × 6–9 mm, apex truncate, 3-lobed; lobes 2–4 mm; tube ca. 1 mm. Tubular florets numerous, yellow, 7–10 mm; limb cylindric. Achenes yellowish brown, cuneate, 4–5 mm. Pappus brown, proximal part dark brown, as long as tubular corolla. Fl. and fr. Jul.–Aug.

- Alpine meadows, grassy slopes; 3700–4200 m. SE Xizang, NW Yunnan.


矢叶垂头菊  shi ye chui tou ju

Cremanthodium lobatum Grierson.

Stem solitary, erect, 10–30 cm tall, slender, 1–2 mm in diam. at base, proximally glabrous, distally white pilose. Basal leaves petiolate; petiole 2–17 cm, slender, glabrous, base narrowly sheathed; leaf blade greenish gray, hastate, 0.8–5 × 1.5–7.5 cm, glabrous or abaxially sparsely white pilose, veins tertiary, palmate or palmate-pinnate, prominent abaxially, margin entire or sparsely irregularly dentate, rarely lobed, apex acute or acuminate; lobes oblong or suborbicular; basal lobes divergent, sharply triangular. Stem leaves 1 or 2; proximal one hastate, smaller; middle to distal one sessile, linear-oblong, 1–1.5 cm × 0.5 mm. Capitulum solitary, nodding. involucres hemispheric, 1–1.5 × 1.5–2 cm, base yellowish brown pilose, outside glabrous; phyllaries 8–10, in 2 rows; outer phyllaries lanceolate, 2–3 mm wide, apex acuminate, sometimes caudate; inner phyllaries ovate-lanceolate, 5–6 mm wide, margin brown membranous, apex acute. Ray florets yellow; lamina obovate, 1.4–2.2 cm × 6–7 mm, with brown veins, apex truncate, 3-lobed; tube ca. 1.5 mm. Tubular florets numerous, yellow, 6–7 mm; tube ca. 1 mm. Achenes yellowish brown, oblong, ca. 5 mm. Pappus brown, as long as tubular corolla. Fl. and fr. Jul.–Aug.

- Alpine thickets and meadows; 3700–4200 m. ?Xizang, NW Yunnan.


墨脱垂头菊  mo tuo chui tou ju

Stems caespitose, erect, 18–38 cm tall, slender, 1.5–2 mm in diam. at base, glabrous. Basal leaves numerous, petiolate; petiole 5–19 cm, slender, glabrous, base narrowly sheathed; leaf blade cordate-reniform, 1.2–3.5 × 1.8–5.2 cm, abaxially glabrous, veins palmate-pinnate, margin coarsely dentate, with (11–)16–20 teeth in mature leaves, apex acute. Stem leaves 2 or 3; proximal leaves ovate, shortly petiolate; middle leaves sessile, linear-oblong. 10–23 × 2–4 mm; distal leaves usually 3, subulate, 2–5(–7) mm. Capitulum solitary, nodding. involucres hemispheric, 1.5–2 × 1.2–1.5 cm, base yellowish brown pilose, outside glabrous; phyllaries 8, in 2 rows; outer phyllaries lanceolate-oblong, 2–2.5 mm wide, apex acuminate; inner phyllaries ovate-lanceolate, 5–6 mm wide, margin brown membranous, apex acute. Ray florets yellow, 8–10; lamina oblong, 20–23 × 9–13 mm, with brown veins, apex truncate, 3-lobed; lobes 3.5–3 × 3.4 mm; tube ca. 2 mm; style 8–10 mm; stigma black. Tubular florets numerous, yellow, 6–7 mm; style 10–12 mm. Achenes cylindrical, 4–5 mm. Pappus brown, 3.5–4 mm, shorter than tubular corolla. Fl. Aug.

- Alpine thickets and meadows; 3700–4200 m. SE Xizang (Mêdog).


宽裂垂头菊  kuan lie chui tou ju

Stems several, erect, 30–40 cm tall, glabrous. Basal leaves petiolate; petiole 8–14 cm, slender, glabrous, base slightly sheathed; leaf blade green, cordate-reniform to hastate, 4.5 × 5.2–6.5 cm, thin, glabrous, veins palmate-pinnate, prominent abaxially, margin angular-dentate, apex acute. Stem leaves usually 3(or 4), sessile, ovate to triangular-cordate, 4.5–5.2 × 2.6–3.5 cm, base auriculate; distal leaves ovate, 7–9 × 3–5 mm. Capitulum solitary, nodding. involucres hemispheric, 3.3–2.2 × 1.6–1.8 cm, almost glabrous; phyllaries 10–12, in 2 rows; outer phyllaries lanceolate, 15–16 × 4–5 mm, apex acuminate; inner phyllaries oblong-ovate, 15–16 × 7–8 mm, margin reddish membranous, apex acute. Ray florets yellow; lamina obovate-cuneate,
2–2.4 × 1.6–1.8 cm, apex truncate, usually 3–lobed; lobes 3–5 × 5–8 mm; tube ca. 2 mm. Tubular florets numerous, brownish yellow, 10–11 mm; tube ca. 2 mm; limb campanulate; style pale yellow, ca. 2 cm, stigma black. Achenes obovoid, ca. 3 mm. Pappus yellowish, 7–8 mm, slightly shorter than tubular corolla. Fl. Aug.

- Moist meadows around small lakes surrounded by bamboo thickets; 3600–3700 m. NW Yunnan (Fugong: Gaoligong Shan).


狭叶垂头菊 xia ye chui tou ju

Stem solitary, erect, purplish red, 20–50 cm tall, 3–5 mm in diam. at base, proximally glabrous, distally purplish brown pilose. Basal leaves lanceolate to narrowly lanceolate, 7–23 cm × 3–45 mm, parallel veined, glabrous, base narrowed into a winged petiole, margin entire, apex acute or acuminate. Middle to distal stem leaves 4 or 5, smaller distally, narrowly distally to linear to linear-lanceolate, base semiamplexicaul. Capitula solitary or rarely 2, nodding. Involucrue hemispheric, 0.7–1.5 × 1.3–3.2 cm, outside densely purplish brown pilose; phyllaries 16–24, in 2 rows, lanceolate, 2–4 mm wide, apex acuminate; inner phyllaries narrowly membranous at margin. Florets numerous, yellow, all tubular, 7–8 mm; tube 2–3 mm; limb cylindrical. Achenes brown, cylindrical, 5–6 mm, ribbed. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Oct.

- Alpine swamps, stream banks, scrub; 3200–4800 m. SW Sichuan, SE Xizang, NW Yunnan.


褐毛垂头菊 he mao chui tou ju

Plants grayish green or bluish green. Stem solitary, erect, to 100 cm tall, to 1.5 cm in diam. at base, proximally glabrous, distally white and brown pilose. Basal leaves numerous, broadly petiolate; petiole 6–15 × 1.5–2.5 cm, pinnate-parallel or parallel veined, glabrous, base broadly sheathed; leaf blade narrowly elliptic to lanceolate, 6–40 × 2–8 cm, abaxially shortly pilose along veins, adaxially glabrous, base cuneate, narrowed into a petiole, margin entire or minutely denticulate, apex acute. Middle to distal stem leaves 4 or 5, smaller distally, elliptic, base sheathed. Distalmost stem leaves bracteal, lanceolate, apex acuminate. Capitula 1–13, in raceme, rarely solitary, nodding; peduncles 0.5–8 cm, brown pilose. Involucrue hemispheric, 1.3–1.5 × 1.5–3 cm, outside brown pilose or glabrescent; phyllaries 12–16, in 2 rows, elliptic or oblong, 6–8 mm wide, apex acute or acuminate; inner phyllaries broadly membranous at margin. Ray florets pale yellow; lamina linear-lanceolate, 3–7 cm × 1.5–2.5 mm, apex long acuminate; tube ca. 5 mm. Tubular florets numerous, yellow, ca. 1 cm; tube ca. 3 mm. Achenes yellowish brown, cylindrical, ca. 5 mm. Pappus white, as long as tubular corolla. Fl. Jul–Sep.

- Grasslands, stream banks; ca. 3600 m. NW Sichuan, NE Xizang.


条叶垂头菊 tiao ye chui tou ju

Plants bluish green. Stems 1(–4), erect, to 45 cm tall, 1–3 mm in diam. at base, glabrous or distalmost part sparsely white pilose. Basal leaves broadly shortly petiolate or sessile, linear or linear-lanceolate, to 23 cm × 2.5–5(–30) mm, parallel veined, glabrous, base narrowed, margin entire, apex acute. Stem leaves narrowly elliptic, linear-lanceolate, to linear-amplexicaul, 1–13, in ra-rows, elliptic or lanceolate in basal leaves, linear-lanceolate; distalmost stem leaves bracteal, membranous, apex obtuse. Involucrue hemispheric, 1.2–1.6 × 1.5–2.5 cm, outside densely brown pilose; leaf blade elliptic, base narrowly elliptic to lanceolate, to linear, herbaceous; phyllaries 10–16, in 2 rows, lanceolate or oblance, 3–5 mm wide, apex long acuminate; inner phyllaries brown membranous at margin. Ray florets yellow; lamina linear-lanceolate, 25–60 × 2–5 mm, membranous, translucent, apex long acuminate or ciliate; tube 5–7 mm. Tubular florets numerous, brownish yellow, 8–10 mm; tube ca. 2 mm; limb narrowly cylindric. Achenes yellowish brown, cylindric, ca. 5 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jun–Sep. 2n = 58*.

- Alpine meadows, stream banks, swamp meadows, scrub; 2400–4800 m. SW Gansu, Qinghai, NW Sichuan, E Xizang.

1a. Capitulum without ray florets .......... 24c. var. eligulatum
1b. Capitulum with ray florets.

2a. Ray lamina yellow ....................... 24a. var. lineare
2b. Ray lamina purplish red .................. 24b. var. roseum


膜苞垂头菊 mo bao chui tou ju

Cremanthodium stenactinium var. eligulatum Handel-Mazzetti.

Plants grayish green or bluish green. Stem solitary, erect, 40–50 cm tall, ca. 1.1 cm in diam. at base, middle to proximal part glabrous, distalmost part brown pilose. Basal leaves broadly petiolate; petiole 4–8 cm, to 2.5 cm wide, glabrous, base broadly sheathed; leaf blade oblong or elliptic, 6–15 × 2–6 cm, pinnate-parallel or parallel veined, glabrous, base narrowed into a petiole, margin entire, apex acute or obtuse. Stem leaves 5 or 6, erect; middle to proximal stem leaves oblong, 4–8 cm, tubular-amplexicaul, apex obtuse, mucronate; distalmost stem leaves bracteal, membranous, apex obtuse. Capitula 1–13, in raceme, rarely solitary, nodding; peduncles 0.5–8 cm, brown pilose; leaf blade oblong or glabrescent; phyllaries 12–16, in 2 rows, elliptic or oblong, 6–8 mm wide, apex acute or acuminate; inner phyllaries broadly membranous at margin. Ray florets pale yellow; lamina linear-lanceolate, 3–7 cm × 1.5–2.5 mm, apex long acuminate; tube ca. 5 mm. Tubular florets numerous, yellow, ca. 1 cm; tube ca. 3 mm. Achenes yellowish brown, cylindrical, ca. 5 mm. Pappus white, as long as tubular corolla. Fl. Jul–Oct.

- Alpine swamp meadows, stream banks, scrub; 3000–4300 m. SW Gansu, W Qinghai, NW Sichuan, NE Xizang.
24a. Cremanthodium lineare var. lineare

条叶垂头菊(原变种) tiao ye chui tou ju (yu'an bian zhong)

Senecio armeriifolius Franchet (1892), not Philippi (1891).

Ray lamina yellow.

- Alpine meadows, stream banks, swamp meadows, scrub; 2400–4800 m. SW Gansu, Qinghai, NW Sichuan, E Xizang.

24b. Cremanthodium lineare var. roseum


红花条叶垂头菊 hong hua tiao ye chui tou ju

Ray lamina purplish red.

- Alpine meadows, scrub; 3900–4300 m. NW Sichuan.

24c. Cremanthodium lineare var. eligulatum


无舌条叶垂头菊 wu she tiao ye chui tou ju

Capitulum without ray florets.

- Alpine meadows, stream banks; 4000–4600 m. NW Sichuan.

25. Cremanthodium bhutanicum


不丹垂头菊 bu dan chui tou ju

Plants bluish green. Stem solitary, erect, 10–15 cm tall, 1–2 mm in diam. at base, glabrous or distalmost part sparsely white arachnoid-puberulent. Basal leaves petiolate; petiole 1–2 cm, glabrous, base sheathed; leaf blade abaxially grayish green, adaxially green, linear, linear-lanceolate, or linear-oblong, 1.5–8 cm × 2–3.5 mm, parallel veined, glabrous, base narrowed into a petiole, margin entire, revolute, apex rounded. Middle to distal stem leaves linear, 1.5–2.5 cm, apex obtuse. Capitulum solitary, nodding. Involucre hemispheric, 1.2–1.4 × 1.5–2 cm, outside glabrous; phyllaries 12–18, in 2 rows, oblong, 4–8 × ca. 1 mm, margin 1- or 2-dentate. Middle to distal stem leaves linear, 0.6–1.1 cm, glabrous, pinnately veined, irregularly pinnatifid; lobes narrowly lanceolate, 1.5–6.5 mm, apex acute, white ciliate. Ray florets yellow; lamina elliptic, 1.2–1.4 cm × 4–6 mm, with brown veins, apex obtuse. Tubular florets numerous, yellow, 5–6 mm; tube ca. 1 mm. Achenes (immature) ca. 2 mm. Pappus white, as long as tubular corolla. Fl. Aug.

Alpine meadows; ca. 4300 m. SE Xizang [Bhutan, ?NE India].

26. Cremanthodium conaense


错那垂头菊 cuo na chui tou ju

Plants bluish green. Stem solitary, erect, 10–25 cm tall, 1–2 mm in diam. at base, glabrous or distalmost part sparsely white arachnoid-puberulent. Basal leaves petiolate; petiole 1–2 cm, glabrous, base sheathed; leaf blade abaxially grayish green, adaxially green, linear, linear-lanceolate, or linear-oblong, 1.5–8 cm × 2–3.5 mm, parallel veined, glabrous, base narrowed into a petiole, margin entire, revolute, apex rounded. Middle to distal stem leaves linear, 1.5–2.5 cm, apex obtuse. Capitulum solitary, nodding. Involucre hemispheric, 1.2–1.4 × 1.5–2 cm, outside glabrous; phyllaries 12–18, in 2 rows, oblong, 4–8 × ca. 1 mm, margin 1- or 2-dentate. Middle to distal stem leaves linear, 0.6–1.1 cm, glabrous, pinnately veined, irregularly pinnatifid; lobes narrowly lanceolate, 1.5–6.5 mm, apex acute, white ciliate. Ray florets yellow; lamina elliptic, 1.2–1.4 cm × 4–6 mm, with brown veins, apex obtuse. Tubular florets numerous, yellow, 5–6 mm; tube ca. 1 mm. Achenes (immature) ca. 2 mm. Pappus white, as long as tubular corolla. Fl. Aug.

- Alpine meadows, stream banks; 4000–4600 m. NW Sichuan.

27. Cremanthodium dissectionum


细裂垂头菊 xi lie chui tou ju

Stem solitary, erect, 25–40 cm tall, slender, 1.5–2 mm in diam. at base, proximally glabrous, distally brown pilose. Basal leaves long petiolate; petiole 3.5–13 cm, slender, glabrous, base sheathed; leaf blade ovate, 1.5–4 × 2–6 cm, glabrous, pinnately veined, subpinnatisect; lobes narrowly lanceolate, 1–3 cm × 1–4 mm, apex acuminate, mucronate. Middle stem leaves fewer, pinnatisect or linear. Capitulum solitary, nodding. Involucre hemispheric, 1.2–1.4 × 1.5–2 cm, outside glabrous; phyllaries 10–12, in 2 rows, oblong-lanceolate, 3–5 mm wide, margin brown membranous, apex acuminate, white ciliate. Ray florets yellow; lamina oblongate, 1.5–1.7 cm × 6–9 mm, apex truncate, 3-lobed. Tubular florets numerous, yellow, 7–9 mm; tube ca. 1 mm. Achenes (immature) ca. 3 mm. Pappus brown, 6–7 mm, slightly shorter than tubular corolla. Fl. and fr. Aug.–Sep.

- Grassy slopes; ca. 3000 m. NW Yunnan.

28. Cremanthodium pinatitifidum

Bentham, Hooker’s Icon. Pl. 12: 39. 1873.

羽裂垂头菊 yu lie chui tou ju

Senecio himalayensis Franchet.

Stem solitary, erect, 8–15 cm tall, proximally glabrous, distally black pilose. Basal leaves shortly petiolate; petiole to 4 cm, base enlarged sheathed; leaf blade oblong, 1.8–5 cm, glabrous, pinnately veined, irregularly pinnatifid; lobes 5–12 pairs, oblong, 4–8 × ca. 1 mm, margin 1- or 2-dentate. Middle to distal stem leaf absent or solitary, bracteal, base sheathed, distally lobed. Capitulum solitary, nodding. Involucre hemispheric, 8 × 12 mm, outside densely black pilose; phyllaries in 2 rows, oblong, lanceolate, or ovate, ca. 1 cm × to 6 mm, apex acute or obtuse; inner phyllaries membranous at margin. Ray florets yellow; lamina oblong, to 1 cm × 4–7 mm, apex truncate, deeply dentate. Tubular florets numerous, yellow, ca. 6 mm; tube ca. 1 mm. Pappus white, as long as tubular corolla. Fl. Aug.

- Alpine rocky places; 4300–4600 m. SE Xizang [Bhutan, India (Sikkim), Nepal].

29. Cremanthodium sino-oblongatum


铲叶垂头菊 chan ye chui tou ju

Stem solitary, erect, often purplish red, 15–25 cm tall, 1.5–2.5 mm in diam. at base, distally branched or simple, densely white arachnoid-pilose. Basal leaves petiolate; petiole 2–4 cm, white pilose, base sheathed; leaf blade spatulate, 2.5–5 × 1.5–4

- Alpine meadows, mountain summits; 4300–4600 m. SE Xizang.
cm, abaxially sparsely white pilose, adaxially glabrous, pinnate veins prominent abaxially, base truncate or shallowly cordate, margin triangular-dentate or denticulate, apex rounded. Stem leaves numerous, sessile or shortly petiolate, spatulate to linear, smaller distally, not amplexicaul. Capitulum usually solitary, very rarely solitary at apex of branch, nodding. Involucre hemispheric, 1.5–1.7 × 2.5–3.5 cm, outside white pilose; phyllaries 14–18, in 2 rows, lanceolate, apex acute. Ray florets yellow; lamina oblanccolate, 1.3–1.6 cm, apex truncate, lobed; tube ca. 2 mm. Tubular florets numerous, yellow, ca. 6 mm; tube ca. 1 mm; limb cylindric. Achenes pale brown, oblong, 3–5 mm, ribbed. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Nov.

- Forest understories, scrub, grassy slopes, alpine meadows; 2800–4500 m. SW Sichuan, NW Yunnan.


木里垂头菊 mu li chui tou ju

Plants grayish green, mealy. Stem solitary, erect, 20–40 cm tall, 2–4 mm in diam. at base, glabrous. Basal leaves petiolate; petiole to 6 cm, glabrous, with narrow wings, base sheathed; leaf blade narrowly elliptic or narrowly spatulate, 10–18 × to 2.5 cm, thick, succulent, glabrous, pinnately veined, base gradually narrowed into petiole, margin entire, apex acute or obtuse. Stem leaves 4–6, sessile, bracteate, lanceolate, 2–9 cm, smaller distally. Capitulum solitary, nodding; leaflike bracts 5 or 6, grayish green, ovate or ovate-lanceolate, to 1.5 × 1.2 cm, apex acute, glabrous. Involucre hemispheric, ca. 1 × to 2.5 cm, outside glabrous; phyllaries in 2 rows, lanceolate or ovate-lanceolate, 3–5 mm wide, apex acuminate. Ray florets yellow; lamina linear-lanceolate, to 3 cm, apex acuminate. Tubular florets numerous, yellow, ca. 8 mm; tube ca. 3 mm. Achenes (immature) oblong, 3–5 mm. Pappus white, ca. 4 mm, shorter than tubular corolla. Fl. Jul–Aug; fr. Aug–Sep.

- Forest understories, grassy slopes, alpine meadows; 3000–4300 m. SW Sichuan, NW Yunnan.


总状垂头菊 zong zhuang chui tou ju

Plants grayish green, mealy. Stem solitary, erect, 50–55 cm tall, 4–5 mm in diam. at base, proximally glabrous, distally white puberulent and brown pilose. Basal leaves petiolate; petiole 5–6 cm, slender, glabrous, winged; leaf blade broadly elliptic or oblong, 10–11 × 4–7 cm, pinnately veined, glabrous, base narrowed into a petiole, margin entire, apex obtuse. Stem leaves 7–9, smaller distally; middle leaves sessile, broadly elliptic or oblong, to 8 × 5 cm, base rounded, semiamplexicaul, margin entire, apex obtuse. Distal stem leaves lanceolate to linear, erect, adnate, base semiamplexicaul. Capitula 5 or 6, in lax raceme, nodding; peduncles 1–2 cm, white puberulent and brown pilose. Involucre nearly hemispheric, 6–8 × ca. 10 mm, outside glabrous, base hairy; phyllaries 8–10, in 2 rows, oblong, 3–4 mm wide, ciliate, apex acute; inner phyllaries broadly membranous at margin. Ray florets yellow; lamina elliptic, 5–6 × ca. 4 mm, apex obtuse, 2- or 3-dentate; tube ca. 1 mm. Tubular florets numerous, ca. 5 mm, apex dark brown; tube ca. 1 mm. Achenes (immature) oblong, ca. 4 mm. Pappus pale yellow, 2–3 mm, shorter than tubular corolla. Fl. Jul.

- Grassly slopes; ca. 3100 m. S Xizang.


匙叶垂头菊 shi ye chui tou ju

Plants grayish green, mealy. Stem solitary, erect, 12–15 cm tall, 1.5–2 mm in diam. at base, proximally glabrous, distally brown pilose. Basal leaves petiolate; petiole 2.5–9 cm, slender, glabrous, base sheathed; leaf blade abaxially pale green or purplish red when dry, adaxially leaf green, dark or ovate-cordate, 1.5–5.5 × 1–4.5 cm, thick, nitid, glabrous, white pinnate veins prominent abaxially, base shallowly cordate or subtruncate, margin crenate-dentate, apex rounded. Stem leaves smaller distally, proximal leaves shortly petiolate, sheath amplexicaul, leaf blade ovate; distal stem leaves sessile, bracteate, linear. Capsules solitary, nodding. Involucre hemispheric, 1.2–1.4 × to 2 cm, outside glabrous, base shallowly cordate or subtruncate, margin crenate-dentate, apex rounded. Stem leaves smaller distally, proximal leaves shortly petiolate, sheath amplexicaul, leaf blade ovate; distal stem leaves sessile, bracteate, linear. Capsules solitary, nodding. Involucre hemispheric, 1.2–1.4 × to 2 cm, outside glabrous, base brown pilose; phyllaries 12–14, in 2 rows, lanceolate or ovate-lanceolate, 3–5 mm wide, apex acuminate. Ray florets; lamina broadly oblong, to 3 cm, apex acuminate. Tubular florets numerous, yellow, ca. 8 mm; tube ca. 3 mm. Achenes (immature) oblong, 3–5 mm. Pappus white, ca. 4 mm, shorter than tubular corolla. Fl. Jul–Aug; fr. Aug–Sep.

- Rocky slopes; 3700–4300 m. SE Xizang.


向日垂头菊 xiang ri chui tou ju


Plants grayish green, mealy. Stem solitary, erect, 7–56 cm tall, 2–4 mm in diam. at base, glabrous. Basal leaves petiolate; petiole 1–12 cm, slender, glabrous, base long sheathed; leaf blade ovate-elliptic to broadly elliptic, 3–15 × 1.2–9 cm, glabrous, pinnately veined, base cuneate, margin entire, apex obtuse. Stem leaves 6–8, sessile, erect, adnate, tubular-amplexicaul. Capsules solitary, nodding; leaflike bracts several, ovate-lanceolate or broadly elliptic, 1.5–2.5 × 1.5 cm, grayish green, glabrous, margin entire, usually surrounding capitulum. Involucre hemispheric, 1–1.5 × 2–2.5 cm, outside glabrous, grayish green or blackish gray when dry; phyllaries 12–20, in 2 rows, lanceolate or ovate-lanceolate, 3–7 mm wide, apex acute or acuminate. Ray florets yellow; lamina narrowly lanceolate, to 3.5 cm × 3–4 mm, apex acuminate or caudate, 3-lobed; tube ca. 2 mm. Tubular florets numerous, yellow, 6–7 mm; tube ca. 1 mm; limb cylindric. Achenes pale brown, oblong, 3–5 mm, ribbed. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Nov.

- Forest understories, scrub, grassy slopes, alpine meadows; 2800–4500 m. SW Sichuan, NW Yunnan.


裂舌垂头菊 lie she chui tou ju

Stem solitary, erect, 12–15 cm tall, slender, 1.5–2 mm in diam. at base, proximally glabrous, distally brown pilose. Basal leaves petiolate; petiole 2.5–9 cm, slender, glabrous, base sheathed; leaf blade abaxially pale green or purplish red when dry, adaxially leaf green, ovate or ovate-cordate, 1.5–5.5 × 1–4.5 cm, thick, nitid, glabrous, white pinnate veins prominent abaxially, base shallowly cordate or subtruncate, margin crenate-dentate, apex rounded. Stem leaves smaller distally, proximal leaves shortly petiolate, sheath amplexicaul, leaf blade ovate; distal stem leaves sessile, bracteate, linear. Capsules solitary, nodding. Involucre hemispheric, 1.2–1.4 × to 2 cm, outside glabrous, base brown pilose; phyllaries 12–14, in 2 rows, lanceolate, 2–4 mm, white ciliate, apex acuminate; inner phyllaries membranous at margin. Ray florets yellow; lamina broadly oblong-lanceolate, 2–3 cm × 7–9 mm, apex truncate, 3-lobed; tube ca. 2 mm. Tubular florets numerous, yellow, 8–10 mm; tube ca. 1.5 mm. Pappus pale brown, slightly shorter than tubular corolla. Fl. and fr. Aug.

- Grassly slopes; 3700–4300 m. SE Xizang.
**Cremanthodium hirtiflorum** S. W. Liu.

Plants grayish green, mealy. Stem solitary, erect, to 100 cm tall, 4–5 mm in diam. at base, proximally glabrous, distally white puberulent. Basal leaves petiolate; petiole 5–12 cm, glabrous, base sheathed; leaf blade oblong-spatulate, 10–15 × 4–7.5 cm, glabrous, pinnately veined, base gradually narrowed into a winged petiole; margin entire, apex rounded or obtuse. Middle to distal stem leaves 6 or 7, erect, adnate, sessile, smaller distally, oblong to lanceolate, base semiamplexicaul, apex acuminate. Capitula ca. 10, in raceme, nodding; peduncles to 3 cm, shortly white pubescent. Involucre hemispheric, 6–7 × ca. 10 mm, outside glabrous; phyllaries 13, in 2 rows, 1.5–3 mm wide, apex acuminate, ciliate; outer phyllaries lanceolate; inner phyllaries oblong, margin white membranous. Ray florets yellow, lamina oblong, ca. 7 × 2 mm, apex acute; tube ca. 1 mm. Tubular florets numerous, yellow, ca. 5 mm; tube ca. 1 mm. Achenes brown, oblong, ca. 4 mm. Pappus absent. Fl. and fr. Sep.

- Grassy slopes, gravelly places; 3500–4100 m. SW Sichuan, SE Xizang, NW Yunnan.

### 37. Cremanthodium brachychaetum


**短缨垂头菊 duan ying chui tou ju**

Plants grayish green, mealy. Stem solitary, erect, 25–35 cm tall, proximally glabrous, distally black pilose. Basal leaves petiolate; petiole 5–11 cm, slender, glabrous; leaf blade oblong or elliptic, 2–5 × 1–3 cm, glabrous, pinnately veined, base cuneate or truncate, margin sparsely dentate, apex obtuse. Stem leaves 3, sessile, erect, adnate, oblong, 2.5–4 × ca. 1.5 cm, base semiamplexicaul. Capitulum 1 (or 2), nodding; peduncles 4–9 cm, black pilose. Involucre hemispheric, 8–10 × ca. 15 mm, outside black, glabrous; phyllaries in 2 rows, oblong, 2–4 mm wide, apex acute; inner phyllaries membranous at margin. Ray florets yellow; lamina oblong, 1.1–1.3 cm × to 6 mm, apex obtuse or acute, 2- or 3-dentate; tube ca. 1 mm. Tubular florets numerous, yellowish brown, ca. 5 mm; tube ca. 1 mm; limb ca. 2 mm wide. Achenes obovate-lanceolate, ca. 5 mm. Pappus yellowish white, 1–2 mm, shorter than tubular corolla. Fl. Jul–Aug.

- Grassy slopes; ca. 3500 m. NW Yunnan.

### 38. Cremanthodium lingulatum


**舌叶垂头菊 she ye chui tou ju**

Plants grayish green, mealy. Stem solitary, erect, 25–56 cm tall, 2–3 mm in diam. at base, glabrous. Basal leaves petiolate; petiole 2–5 cm, narrowly winged, base narrowly sheathed; leaf blade oblong or lanceolate-spatulate, 2.5–10 × 1.5–3 cm, glabrous, pinnately veined, base cuneate, gradually narrowed into petiole, margin entire or denticulate, apex rounded. Stem leaves 3–5, sessile, adnate, tubular-amplexicaul; leaf blade ovate-oblong or oblong, 2.5–5.5 cm, apex rounded. Capitulum solitary, nodding. Involucre hemispheric, ca. 1.5 × to 2 cm, outside glabrous, blackish gray when dry; phyllaries 10–14, in 2 rows; outer phyllaries lanceolate, 2–3 mm wide, apex acuminate; inner phyllaries oblong, 4–7 mm wide, apex obtuse or obtuse. Ray florets yellow; lamina linear-lanceolate, 2.5–3.5 cm × 2–2.5 mm, apex acuminate; tube 4–5 mm. Tubular florets numerous, blackish gray when dry, 5–6 mm; tube to 1.5 mm. Achenes yellowish brown, cylindric, ca. 5 mm. Pappus white as long as tubular corolla. Fl. Jul–Aug.

- Grassy slopes, alpine meadows; 3400–4000 m. NW Xizang, S Xizang.

### 39. Cremanthodium yadongense


**亚东垂头菊 ya dong chui tou ju**

Plants gray-green, mealy. Stem solitary, erect, 25–56 cm tall, 2–3 mm in diam. at base, lower part glabrous, upper part brown pilose. Basal leaves petiolate; petiole 1–3 cm, glabrous and mealy, base narrowly sheathing; leaf blade ovate, 3–6 × 2.5–4.5 cm, glabrous, pinnately veined, base cordate, cuneate,
margin entire or denticulate, apex obtuse. Stem leaves 1–3, erect, adnate, tubular-amplexicaul. Capitulum solitary, nodding. Involucre hemispherical, 1–1.3 mm, to 2.5 cm wide, outside glabrous, base brown pilose, black-gray when dry; phyllaries 14–20, in 2 rows, oblong or lanceolate, 3–5 mm wide, apex acuminate; inner phyllaries with brown margin. Ray florets yellow; lamina lanceolate, 15–60 mm long, apex acuminate; tube 2 cm. Tubular florets numerous, yellow-brown, ca. 4 mm. Achenes cylindric, ca. 2 mm. Tubular florets numerous, yellow, 5–8 mm; corolla narrowly funnelform. Achenes yellowish brown, linear-cylindric, 3–6 mm, ribbed. Pappus white, numerous, in many rows, outer ones 5–12 mm, longer than tubular corolla, thick. Fl. and fr. Jul–Aug.


小垂头菊 xiao chui tou ju

Stem solitary, erect, 5–10 cm tall, proximally glabrous, purplish red, distally densely white puberulent; underground stem white, with scale leaf. Basal leaves petiolate; petiole 2–4 cm, glabrous, base sheathed; leaf blade ovate, obovate, or orbicular, 1–3.9 × 0.5–2.7 cm, densely white puberulent or abaxially glabrescent, adaxially glabrous, pinnately or subparallel veined to petiole, base cuneate, margin entire, apex rounded or acute. Stem leaves crowded distally, 2–4, sessile, ovate to oblong, both surfaces white puberulent or adaxially glabrescent, base semiamplexicaul. Capitulum solitary. Involucre hemispherical, 1–1.5 × 1.5–3 cm, outside densely black and white pilose; phyllaries 10–14, in 1 row, base united and cupular; separate part oblong, 2–3 mm wide, spreading at anthesis, apex obtuse or rounded. Ray florets yellow; lamina elliptic, 6–8 × 3–4 mm, shorter than phyllaries, apex obtuse, dentate; tube 3–5 mm. Tubular florets numerous, yellow, 5–8 mm; corolla narrowly funnel-form. Achenes yellowish brown, linear-cylindric, 3–6 mm, ribbed. Pappus white, numerous, in many rows, outer ones 5–12 mm, longer than tubular corolla, thick. Fl. and fr. Jul–Aug.

Gravelly areas on mountains; 4000–5400 m. SW Sichuan, S Xinjiang, Xizang, NW Yunnan [India (Sikkim), Kashmir, Nepal, Pakistan].


小舌垂头菊 xiao she chui tou ju

Stem solitary, erect, dark purple, 4–15 cm tall, proximally glabrous, distally white and black puberulent. Basal leaves petiolate; petiole purplish brown, 4–14 cm, glabrous; leaf blade ovate or broadly ovate, 1.3–0.7–2.4 cm, with 3–5 pinnate veins, both surfaces white and black puberulent, base rounded or truncate, margin entire, apex rounded. Stem leaves 3, petiolate or sessile, ovate to oblong-ovate, 1.5–4 × 1–2 cm, both surfaces white puberulent or only abaxially, base semiamplexicaul, apex obtuse. Capitulum solitary, erect. Involucre hemispheric, 1.5–2 × 2.5–3 cm, outside densely white and black puberulent; phyllaries 9–12, in 1 row, oblong to narrowly lanceolate, 3–7 mm wide, rectangular-spaying from middle, apex obtuse to acute. Outer florets white; corolla narrowly tubular, 3–6 mm, slender; limb apically truncate or a small linear lamina; style 6.5–11 mm. Central florets numerous, orange, tubular; limb 5-lobed. Achenes yellowish brown, cylindric, 4–6 mm, ribbed. Pappus white, 1–1.2 cm, as long as tubular corolla. Fl. and fr. Jul–Sep. 2n = 58*.  

Grassy slopes in gravelly areas on mountains, alpine meadows, swamp meadows; 4000–5400 m. SW Gansu, Qinghai, SW Sichuan, NW Yunnan.

小叶垂头菊  xiao ye chui tou ju

Stem solitary, erect, ca. 7 cm tall, ca. 1 mm in diam. at base, with rosette leaves, proximally glabrous, distally white and black pilose. Basal leaves 2, petiolar; petiole purplish brown, to 6 cm, glabrous, base sheathed; leaf blade ovate, 1.5–1.7 × ca. 1 cm, glabrous, pinnately veined, base cuneate, margin entire, slightly revolute, apex rounded. Stem leaves 3, proximal one a scale; middle one petiolar; petiole purplish red, glabrous, ca. 1 cm, base enlarged, sheath amplexicaul; leaf blade ovate; distal one linear, white puberulent. Capitulum solitary. Involucre hemispheric, 8–9 × ca. 15 mm, outside densely white and black pilose; phyllaries 10–12, in 1 row, base united and cupular; separate part narrowly lanceolate, 1.5–2.5 mm wide, apex acute. Ray florets yellow; lamina extending from involucral, to 1.7 cm, apex acute; tube ca. 4 mm. Tubular florets numerous, yellow, ca. 7 mm; tube ca. 1.5 mm. Achenes (immature) 2–3 mm. Pappus white, as long as tubular corolla. Fl. Jul.

Gravelly areas on mountains; 4800–5000 m. SE Xizang.


矮垂头菊  ai chui tou ju

Cremanthodium comptum W. W. Smith; Senecio kansuensis Franchet.

Stem solitary, erect, 5–20 cm tall, 2–3 mm in diam. at base, proximally glabrous, distally long white and black pilose; underground stem stocklike, horizontal or ascending, with scale leaf and roots on nodes. Rosette of leaves absent. Stem leaves numerous. Proximal stem leaves petiolar; petiole 2–14 cm, glabrous, base ± sheathed; leaf blade ovate or ovate-oblong, sometimes orbicular, 0.7–6 × 1–4 cm, abaxially densely white puberulent, adaxially glabrous, pinnately veined, base cuneate or rounded, margin entire or shallowly dentate, apex obtuse or rounded. Middle to distal stem leaves sessile or shortly petiolate; leaf blade ovate to linear, smaller distally, abaxially densely white puberulent, margin entire or dentate. Capitulum solitary. Involucre hemispheric, 8–13 × 10–30 mm, outside densely white and black pilose; phyllaries 8–12, in 1 row, base united and cupular; separate part linear-lanceolate, 1.5–3 mm wide, apex acute. Ray florets yellow; lamina extending from involucral, 1.5 × 3–5 mm, extending from involucral. Tubular florets numerous, yellow, 6–7 mm; tube ca. 1.5 mm. Achenes (immature) 2–3 mm. Pappus white, as long as tubular corolla. Fl. Jul.

Gravelly areas on mountains; 4100 m. E Xizang.


盘花垂头菊  pan hua chui tou ju

Cremanthodium cuculliferum W. W. Smith; Senecio discoideus (Maximowicz) Franchet.

Stem solitary, erect, 15–30 cm tall, proximally glabrous, distally long white and purplish brown pilose. Basal leaves petiolar; petiole 1–6 cm, glabrous, base sheathed; leaf blade abaxially grayish green, adaxially green or greenish white, ovate-oblong or ovate-lanceolate, 1.5–4 × 0.7–1.5 cm, glabrous, with obscure pinnate veins, base rounded, margin entire or rarely denticulate, apex obtuse. Stem leaves few, proximal leaves sessile, lanceolate, base semiamplexicaul; distal leaves linear. Capitulum solitary, nodding. Involucre hemispheric, 8–10 × 15–25 mm, outside densely long dark brown pilose; phyllaries 8–10, in 2 rows, linear-lanceolate, 1–3 mm wide, apex acute or acuminate. Florets numerous, blackish purple, all tubular, 7–8 mm; tube 2–3 mm. Achenes brown, cylindric, 4–6 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jun–Aug. 2n = 58.

Grassy slopes, canopy gaps in forests, gravelly areas on mountains, swamp meadows; 3000–5000 m. Gansu, Qinghai, Sichuan, Xizang [Bhutan; ?India (Sikkim), Nepal].


硕首垂头菊  shuo shou chui tou ju

Stem solitary, erect, 20–30 cm tall, ca. 4 mm in diam. at base, distally branched in synflorescence, densely white puberulent. Basal leaves petiolar; petiole purplish red, 3.5–8.5 cm, to 1.6 cm wide, broadly winged, base sheathed; leaf blade obovate, oblong, or elliptic, 6–9 × 3–5 cm, both surfaces white pilose or adaxially glabrescent, pinnately veined, base broadly cuneate, attenuate into a winged petiole, margin entire or remotely denticulate, apex rounded or obtuse. Middle to distal
stem leaves smaller, lanceolate to linear, apex acuminate. Capitula 1–4, in corymbose raceme or solitary, nodding; peduncles 9–17 cm. Involucre hemispheric, 1.5–2 × 3–4 cm, outside densely white puberulent and black pilose; phyllaries 14–24, in 2 rows, 3–5 mm wide, apex acuminate, ciliate; outer phyllaries narrowly lanceolate; inner phyllaries lanceolate, margin brown membranous. Ray florets yellow; lamina narrowly lanceolate, 2–4 cm × 4–8 mm, apex acute, 3-dentate; tube ca. 5 mm. Tubular florets numerous, dark yellow, 6–8 mm; tube ca. 2 mm; limb cylindrical. Achenes brown, cylindric, ca. 6 mm, ribbed. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Aug.

- Gravelly areas on mountains; 4800–5000 m. NW Sichuan (Sêr-tar), SE Xizang.


毛叶垂头菊 mao ye chui tou ju

Stem solitary, erect, 20–35 cm tall, 3–6 mm in diam. at base, shortly white pilose. Basal leaves petiolate; petiole 3–6 cm, shortly white pilose, base sheathed; leaf blade oblong or ovate-oblong, rarely suborbicular, 3.5–9 × 2–6 cm, both surfaces densely shortly white pilose, pinnately veined, base rounded or broadly cuneate, margin shallowly dentate, apex rounded or obtuse. Stem leaves 3–5, sessile, bracteal, oblong to linear, 3–5 cm, base semiamplexicaul. Involucre black, hemispheric, 9–11 × 20–25 mm, outside densely white puberulent and dark brown pilose. Basal leaves petiolate; phyllaries 12–16, in 2 rows, lanceolate, 3–5 mm wide, apex acute; inner phyllaries membranous at margin. Ray florets yellow; lamina linear-oblong, (2–)3–4 cm × 2–5 mm, apex acute, dentate; tube ca. 7 mm. Tubular florets numerous, dark yellow, 8–11 mm; tube 3–5 mm. Achenes cylindric, ca. 5 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jun–Sep.

- Wet grassy slopes, alpine meadows; 3600–4200 m. NW and Yunnan [Myanmar].


长舌垂头菊 chang she chui tou ju

Senecio pratii Hemsley, Hooker’s Icon. Pl. 25: t. 2491. 1896.

Stem solitary, erect, 25–40 cm, ca. 3 mm in diam. at base, proximally glabrous, distally white puberulent. Basal leaves petiolate; petiole 4–12 cm, glabrous, base ± sheathed; leaf blade abaxially greenish white, adaxially dark green, ovate or ovate-oblong, 2–7.5 × 1.5–4 cm, glabrous, pinnately veined, base cordate, margin entire or rarely denticulate, apex rounded. Stem leaves 1 or 2, sessile, oblong, base semiamplexicaul, margin entire, apex obtuse. Cataphyllum solitary, nodding. Involucre oblong, 1.5–2 × 3–4 cm, outside densely long brown and white pilose; phyllaries 12–16, in 2 rows, lanceolate, 1.5–4 mm wide, apex caudate-acuminate. Ray florets yellow; lamina linear-lanceolate, 4–6 cm × 2–5 mm, apex long acuminate, entire or lobed. Tubular florets numerous, yellow, 6–7 mm; tube 1.5–2 mm. Achenes oblong, 5–6 mm, tuberculate. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Aug.

- Alpine meadows; 3400–4400 m. NE Yunnan.


稻城垂头菊 dao cheng chui tou ju

Stem solitary, erect, 20–50 cm tall, 3–6 mm in diam. at base, proximally glabrous, distally white puberulent. Basal leaves petiolate; petiole ca. 20 cm × to 5 mm, base narrowly sheathed; leaf blade broadly triangular or ovate-triangular, 6–13 × 7–10 cm, glabrous or abaxially initially white puberulent, glabrescent, pinnate veins prominent abaxially, base truncate, margin sharply dentate or undulate-dentate, apex acute. Middle stem leaves shortly petiolate, base sheathed; leaf blade ovate-triangular, small, ca. 6 × to 7 cm. Distal stem leaves sessile, ovate-lanceolate, base semiamplexicaul. Involucre hemispheric, 1–1.2 × 2–2.5 cm, outside glabrous, rarely puberulent at base; phyllaries 10–14, in 2 rows, ovate-lanceolate or elliptic, 6–8 mm wide, apex acute. Ray florets yellow; lamina linear-lanceolate, 2.5–4.5 cm, to 9 mm wide at base, apex caudate-acuminate, 3-lobed; tube ca. 2 mm. Tubular florets numerous, yellow, 6–7 mm; tube ca. 1 mm; limb campanulate, 3–3.5 mm. Achenes oblong-lanceolate, ca. 4 mm, ribbed. Pappus brown, as long as tubular corolla. Fl. and fr. Jul–Sep.

- Wet grassy slopes, alpine meadows; 3200–4400 m. NW Sichuan.


Stem solitary, erect, 10–15(–45) cm tall, 3–6 mm in diam. at base, proximally glabrous, distally white and black pilose. Basal leaves petiolate; petiole to 5 cm, base sheathed; leaf blade ova
t or ovate-oblong, 3–8 × 2.5–6 cm, thin, herbaceous, glabrous or abaxially hairy along veins, pinnate veins prominent abaxially, base cuneate or subrounded, margin coarsely dentate, apex acute. Middle stem leaves shortly petiolate, base sheathed, amplexicaul; leaf blade ovate, 3–7 × 2–6 cm, glabrous, base cuneate or rounded, margin coarsely dentate, apex obtuse. Distal stem leaves sessile, ovate, base cordate, amplexicaul. Distalmost stem leaves bracteate, lanceolate to oblone, both surfaces hairy. Capitula 1–4, in lax raceme, nodding; peduncles 2–3.5 cm, white pilose. Involucre hemispheric or broadly campanulate, 9–20 × 20–40 mm, outside black pilose; phyllaries ca. 14, in 2 rows, 3–10 mm wide, apex acute, white ciliate; outer phyllaries lanceolate; inner phyllaries broadly ovate, margin broadly membranous. Ray florets yellow; lamina broadly elliptic, 1.5–
2.7 cm × 6–9 mm, apex obtuse, 3-dentate. Tubular florets numerous, 6–9 mm; tube 1–3 mm; limb narrowly campanulate. Achenes brown, cylindrical, 5–6 mm, ribbed. Pappus white, as long as tubular corolla. Fl. and fr. Aug.

Gravelly areas on mountains; 3600–4600 m. S and SW Sichuan [Kashmir, Nepal, Pakistan].


中甸垂头菊 zhong dian chui tou ju

Plants white arachnoid-puberulent. Stem solitary, erect, 32–76 cm tall, 8–10 mm in diam. at base. Basal leaves petiolate; petiole to 15 cm, winged; wings entire, wider distally; leaf blade ovate or ovate-oblong, 14–23 × 7–14 cm, herbaceous, both surfaces initially white arachnoid-puberulent, glabrescent in fruit, pinnately veined, with 8–13 pairs of lateral veins, base broadly cuneate, narrowed into a winged petiole, margin entire or denticulate, apex obtuse. Middle stem leaves shortly petiolate or sessile; leaf blade smaller, oblong or elliptic; sheath enlarged, cymbiform, to 10 × 1.5 cm, amplexicaul. Distal stem leaves ob-
long, 4–8.5 × 2–6 cm, parallel veined, apex obtuse, mucronate; sheath amplexicaul. Capitula 5–13, in lax raceme, to 26 cm, nodding; peduncles equal to, 10 cm. Involucre hemispheric, 8–11 × 20–25 mm, outside white puberulent; phyllaries 14–16, in 2 rows; outer phyllaries lanceolate, 2–3 mm wide, apex acute or acuminate; inner phyllaries oblong, 4–5 mm wide, margin membranous, apex triangular or obtuse. Ray florets yellow; lamina oblong or elliptic, 1–1.3 cm × 4–7 mm, apex rounded, 2- or 3-denticulate; tube ca. 2 mm. Tubular florets numerous, yellow, 6–8 mm; tube 1.5–2 mm. Achenes brown, cylindric, ca. 5 mm. Pappus brown, as long as tubular corolla. Fl. Jul–Aug.

* Grassy slopes, stream banks; 3600–4100 m. NW Yunnan.


革叶垂头菊  ge ye chui tou ju


Stem solitary, erect, 35–55 cm tall, 3–4 mm in diam. at base, proximally glabrous, distally white arachnoid-puberulent. Basal leaves petiolate; petiole 7–12 cm, subglabrous; leaf blade ovate or broadly ovate, (2.5–)6–10 × (2–)4–5 cm, leathery, nitid, glabrous, both surfaces with prominent pinnate reticulate veins, base cuneate, margin denticulate, apex obtuse. Middle to distal stem leaves sessile, smaller, bracteal, ovate-oblong, base semiamplexicaul, apex acute or acuminate. Capitula 2–5, in raceme, or rarely solitary, nodding; peduncles 2–6 cm, white arachnoid-puberulent. Involucre hemispheric, 8–11 × 20–30 mm, outside white arachnoid-puberulent or glabrous; phyllaries 10–14, in 2 rows, lanceolate or ovate-lanceolate, 3–5 mm wide, white ciliate, apex acute; inner phyllaries broadly membranous at margin. Ray florets yellow; lamina oblong, 1–1.5 cm × to 5 mm, apex 2- or 3-denticulate; tube ca. 2 mm. Tubular florets numerous, yellow, ca. 6 mm; tube ca. 1 mm. Achenes brown, oblong, 4–5 mm. Pappus white, as long as tubular corolla. Fl. Jul–Aug.

* Grassy slopes, rocky slopes, grasslands, alpine meadows; 3000–4000 m. NW and W Yunnan.


戟叶垂头菊 ji ye chui tou ju


Stem solitary, erect, 15–33 cm tall, slender, proximally glabrous, distally brown pilose. Basal leaves petiolate; petiole 3–8 cm, glabrous; leaf blade ovate-cordate or orbicular-cordate, 1.5–2.5 × 1.5–2 cm, subleathery, nitid, glabrous, pinnately veined, with conspicuous reticulate veins, base cordate, margin entire, or shallowly crenate, apex rounded or obtuse. Stem leaves few, bracteal, linear. Involucre hemispheric, ca. 1 × 1–2 cm, outside brown pilose or glabrate, glabrescent; phyllaries 10 or 11, in 2 rows, lanceolate, 2–4 mm wide, apex acute. Ray florets yellow; lamina oblong, 1.1–1.3 cm × to 5 mm, apex obtuse; tube ca. 2 mm. Tubular florets numerous, yellow, ca. 6 mm; tube ca. 1.5 mm; limb campanulate. Achenes straw-colored, ca. 4 mm, with 5 thick ribs, apex truncate. Pappus pale brown, as long as tubular corolla. Fl. and fr. Aug.

* Alpine meadows; 2900–4400 m. SW Sichuan, NW Yunnan.


香客来垂头菊 xiang ke lai chui tou ju


方叶垂头菊 fang ye chui tou ju


Stem solitary, erect, 10–30 cm tall, 1.5–3 mm in diam. at base, proximally glabrous, distally brown puberulent. Basal leaves petiolate; petiole 2–6 cm, brown puberulent, base sheathed; leaf blade oblong, square to linear. Involucre hemispheric, 8–13 × 10–20 mm, outside brown puberulent or glabrous; phyllaries ca. 12, in 2 rows, 3–5 mm wide, apex acute; outer phyllaries lanceolate; inner phyllaries oblong, margin brown membranous. Ray florets yellow; lamina oblong, 1.6–2.5 cm × to 8 mm, dentate or lobed, apex acute or truncate; tube 4–5 mm. Tubular florets numerous, yellow, ca. 8 mm; tube ca. 3 mm. Achenes dark brown, cylindric, ca. 5 mm. Pappus brown, as long as tubular corolla. Fl. and fr. Jul–Aug.

* Alpine scrub, alpine meadows, rocky places; 3600–4600 m. SW Sichuan, NW Yunnan.


方叶垂头菊 fang ye chui tou ju


Stem solitary, erect, 10–30 cm tall, 1.5–3 mm in diam. at base, proximally glabrous, distally brown puberulent. Basal leaves petiolate; petiole 2–6 cm, brown puberulent, base sheathed; leaf blade oblong, square, or suborbicular, 1.8–5 × 2–5 cm, herbaceous, glabrous or abaxially brown pilose along veins, pinnately veined, abaxially with conspicuous veins, base cordate, margin denticulate, apex rounded, truncate, or retuse. Stem leaves few, smaller distally, sessile, bracteal, square to linear. Involucre hemispheric, 8–13 × 10–20 mm, outside brown puberulent or glabrate, glabrescent; phyllaries ca. 12, in 2 rows, 3–5 mm wide, apex acute; outer phyllaries lanceolate; inner phyllaries oblong, margin brown membranous. Ray florets yellow; lamina oblong, 1.6–2.5 cm × to 8 mm, dentate or lobed, apex acute or truncate; tube 4–5 mm. Tubular florets numerous, yellow, ca. 8 mm; tube ca. 3 mm. Achenes brown, cylindric, ca. 5 mm. Pappus brown, as long as tubular corolla. Fl. and fr. Jun–Jul.

* Alpine scrub, alpine meadows, rocky places; 3600–4600 m. SW Sichuan, NW Yunnan.

紫叶垂头菊  zi ye chui tou ju

Stems 1 or 2, erect, 7–15 cm tall, 1.5–2 mm in diam. at base, proximally glabrous, distally purplish red, white arachnoid-puberulent. Basal leaves petiolate; petiole purple, 2–6.5 cm, glabrous or sparsely white arachnoid-puberulent; leaf blade abaxially purple, oblong, broadly oblong, or ovalate-oblong, 3.7–7.5 × 1.5–5.5 cm, abaxially shortly pilose, adaxially glabrous, pinnate veins conspicuous abaxially, base broadly cuneate or rarely truncate, margin denticulate, apex rounded. Stem leaves bracteal, ovate or oblong to linear, 1–3 cm, base sheathed. Capitulum solitary, nodding. Involucre hemispheric, 1–1.5 × 1.5–2 cm, outside black pilose; phyllaries 10–12, in 2 rows, 2–4 mm wide, apex acuminate, white ciliate; outer phyllaries narrowly lanceolate; inner phyllaries oblong. Ray florets yellow; lamina oblong, 8–15 × 2–3 mm; tube 1–1.5 mm. Tubular florets numerous, yellow, blackish gray when dry, 4–5 mm; tube ca. 1 mm; limb tubular. Achenes white, oblong, ca. 3 mm. Pappus white, as long as tubular corolla. Fl. and fr. Aug–Sep.

Grassy slopes, stream banks, rocky places; 4300–4800 m. S Xizang [Nepal].


显脉垂头菊 xian mai chui tou ju

Stem solitary, erect, 8–25 cm tall, 1.5–2.5 mm in diam. at base, densely white or proximally brown and distally white pilose. Basal leaves petiolate; petiole 2–5 cm, slender, densely pilose; base sheathed; leaf blade elliptic, ovate, or obovate, 1.4–5 × 0.6–3.5 cm, glabrous, pinnately veined, base cuneate or subrounded, margin entire and pilose, apex obtuse or rounded. Stem leaves numerous, dense, sessile, linear-oblong, longer than internodes, smaller than basal leaves, margin entire. Capitulum solitary, nodding. Involucre hemispheric, 8–10 × ca. 15 mm, outside glabrous, base pilose; phyllaries 12–14, in 2 rows, oblong or lanceolate, 3–5 mm wide, apex acute; inner phyllaries broader, margin membranous. Ray florets yellow; lamina oblong or narrowly obovate, 1.1–1.5 × 2–4 mm, with brown veins, apex obtuse or truncate, 3-dentate. Tubular florets numerous, deep yellow, 6–7 mm; tube ca. 1 mm. Achenes brown or yellowish brown, obovoid, 2–3 mm. Pappus white, as long as tubular corolla. Fl. and fr. Jul–Oct.

● Grasslands beneath bamboo forests, margins of bamboo forests, grassy slopes, alpine meadows; 3200–4500 m. SW Sichuan, SE Xizang, NW Yunnan.


尼泊尔垂头菊 ni bo er chui tou ju

Stem solitary, erect, 14–30 cm tall, 1–2 mm in diam. at base, black pilose. Basal leaves petiolate; petiole purplish red, 1.5–4 cm, winged, glabrous, base sheathed; leaf blade ovate or oblong, 2.5–5 × 1.5–3.5 cm, thick, glabrous, pinnately veined, base truncate, margin entire and sparsely coarsely dentate, apex acute or subrounded. Middle to distal stem leaves sessile, bracteal, ovate or elliptic to linear, base semiaxilexicaul, margin dentate, apex acuminate. Capitulum solitary, nodding. Involucre hemispheric, 1.1–1.5 × 1–2 cm, outside glabrous; leaflike bracts 3–7, linear; phyllaries 12–14, in 2 rows, 2–4 mm, apex long acuminate, white ciliate; outer phyllaries narrowly lanceolate; inner phyllaries lanceolate, margin membranous. Ray florets yellow; lamina linear-lanceolate, 1.5–2.5 cm × 3–5 mm, apex long acuminate, 3-dentate; tube ca. 4 mm. Tubular florets numerous, dark yellow, 7–8 mm; tube 2–3 mm. Achenes (immature) ca. 3 mm. Pappus white, as long as tubular corolla. Fl. Jul.
Gravelly areas on mountains; 5100–5300 m. S Xizang [Bhutan, ?India (Sikkim)].

67. Cremanthodium oblongatum C. B. Clarke, Compos. Ind. 168. 1876.

矩叶垂头菊 ju ye chui tou ju

*Cremanthodium nakaoi* Kitamura; *Ligularia arnicoides* Candolle ex Royle var. *glabra* Candolle; *Senecio oblongatus* (C. B. Clarke) Franchet; *S. pyrroifolius* H. Léveillé.

Stems 1 or 2, erect, often purplish red, 8–20 cm tall, 2–3 mm in diam. at base, proximally glabrous, distally white puberulent. Basal leaves petiolate; petiole purplish red, winged, 1.5–5 cm, glabrous; leaf blade oblong, orbicular, or elliptic, 2–8 × 1.5–5 cm, thick, glabrous, pinnately veined, base subrounded to cuneate, margin entire and coarsely dentate, apex obtuse or rounded. Stem leaves 3 or 4, sessile, oblong to lanceolate, 1–4.5 × 1.5 cm, base semiamplexicaul, margin remotely dentate, apex obtuse or acute. Capitulum solitary, nodding. Involucre hemispheric, 9–12 × 25 mm, outside black when dry, white puberulent. Phyllaries ovate-lanceolate, 5–8 mm wide, margin yellowish brown; outer phyllaries lanceolate, apex acuminate; inner phyllaries ovate-lanceolate, 5–8 mm wide, margin yellowish brown membranous. Ray florets yellow; lamina oblong, 1–2.5 cm × 2–5 mm, apex acuminate or acute; tube to 5 mm. Tubular florets numerous, dark yellow, 7–8 mm; tube ca. 2 mm. Achenes brown, cuneate-cylindric, 4–5 mm. Pappus white, as long as tubular corolla.

68a. Cremanthodium ellisii var. *ellisii*

车前叶垂头菊(原变种) che qian ye chui tou ju (yuan bian zhong)

*Werneria ellisii* J. D. Hooker, Fl. Brit. India 3: 357. 1881; *Cremanthodium fletcheri* (Hemsley) Hemsley; *C. goringsense* (Hemsley) Hemsley; *C. oblongatum* C. B. Clarke var. *villosus* C. B. Clarke; *C. plantagineum* Maximowicz; *C. plantagineum* f. *albidum* R. D. Good; *C. plantagineum* f. *ellisii* (J. D. Hooker) R. D. Good; *C. plantagineum* var. *maximowiczii* (Franchet) R. D. Good; *C. plantagineum* var. *maximowiczii* (Franchet) B. S. Aswal; *Senecio arnicoides* (Candolle ex Royle) Wallich ex C. B. Clarke var. *frigidus* J. D. Hooker; *S. fletcheri* Hemsley; *S. goringsense* Hemsley; *S. maximowiczii* Franchet; *S. paberensis* Franchet.

Capitulum with ray florets. Ray lamina yellow.

Gravelly areas on mountains, swamp meadows, riverbanks; 3400–5600 m. SW and W Gansu, Qinghai, Sichuan, Xizang, NW Yunnan [Bhutan, India (Sikkim), Kashmir, Nepal, Pakistan].


红舌垂头菊 hong she chui tou ju


Capitulum with ray florets. Ray lamina purplish red.

● Alpine scrub, grassy slopes, alpine meadows; 4000–4300 m. NW Sichuan.


祁连垂头菊 qi lian chui tou ju


Capitulum without ray florets.

● Gravelly areas on mountains; 3000–4600 m. Qinghai, N Xizang.


腺毛垂头菊 xian mao chui tou ju

Stem solitary, erect, 8–20 cm tall, ca. 3 mm in diam. at base, proximally glabrous, distally densely blackish gray pilose and white puberulent, purplish red. Basal leaves petiolate;
petiole purple, 0.5–4 cm, glandular pilose or glabrous, base sheathed; leaf blade ovate-lanceolate, 3.5–7 × 1.5–3.5 cm, both surfaces densely glandular pilose or intermixed sparsely initially white puberulent, glabrescent, pinnately veined, base broadly cuneate to truncate, margin entire and triangular-dentate, apex acute to acuminate. Stem leaves 2–4, sessile, lanceolate to linear, base semiamplexicaul. Capitula 1–3, nodding. Involucre hemispheric, 8–12 × to 15 mm, outside densely blackish gray pilose and white puberulent; phyllaries 12–16, in 2 rows, lanceolate or oblong-lanceolate, 2–4 mm, apex acuminate; inner phyllaries membranous at margin. Ray florets yellow; lamina oblong, 1.5–2 cm × 3–6 mm, apex obtuse; tube 4–5 mm. Tubular florets numerous, dark yellow, 6–8 mm; tube ca. 2 mm. Pappus white, or base sometimes reddish brown, as long as tubular corolla. Fl. Jul–Aug, fr. Aug–Sep.  
- Wet grasslands in valleys, rocky slopes; 5200–5300 m. S Xinjiang (Pishan), C Xizang.


**Sinacalia** hua xie jia shu

**Chen Yilin** (陈艺林 Chen Yi-ling); **Bertil Nordenstam**, Charles Jeffrey

Herbs, perennial, erect, with thick subterranean tuberiform rhizomes and numerous fibrous roots. Leaves simple, petiole not winged, basal and lower stem leaves usually fallen by anthesis; blade ovate to suborbicular, palmately or pinnately veined, base cordate to subtruncate, sometimes expanded and subamplexicaul, but not vaginate. Capitula solitary or few to numerous, arranged in terminal lax corymb or compound paniculoid thyrses, radiate; peduncles bracteolate. Involucres not calyculate, narrowly obconic to somewhat balusterform, broader than filament at base; endothecial cell wall thickening strictly polar. Style branches incurved, obtuse with numerous rather long, prominent, obtuse terminal papillae. Achenes cylindrical, ribbed, glabrous. Pappus persistent, capillary-like.

- Four species: China.

*Ligularia* and *Parasenecio* are the closest relatives to *Sinacalia*. *Sinacalia* differs from the former by its non-vaginate leaf sheaths, from the latter by its radiate capitula, and from both by its tuberiform rhizomes.

1a. Capitula small, numerous, in broad, richly branched paniculoid thyrses; involucre cylindric, ca. 2 mm in diam., phyllaries 5; ray florets 2 or 3.

2a. Leaf blade deeply pinnatisect, with 3 or 4 lateral lobes on each side, pinnately veined ........................................ 4. *S. tangutica*

2b. Leaf blade not lobed, pentagonal or triangular, sinuate, apiculate-dentate, basally palmately 3–5-veined .................. 3. *S. davidii*

1b. Capitula large, 20 or fewer, corymbose or solitary; involucre obconic-campanulate, 5–8 mm in diam., phyllaries 8; ray florets 5–8.

3a. Leaf blade deeply cordate, thickly papery; ray lamina 15–18 mm ................................................................. 1. *S. macrocephala*

3b. Leaf blade shallowly cordate, truncate, or broadly cuneate, leathery or subleathery; ray lamina 8–11 mm ................ 2. *S. caroli*


**大头华蟹甲** da tou hua xie jia


Stems erect, conspicuously striate, robust, 8–10 mm in diam. at base, fusiform, 80–100 cm tall, simple, sparsely puberulent, glabrescent. Leaves subradical, thickly papery, long petiolate; petiole 8–15 cm, stout, expanded and somewhat amplexicaul at base, sparsely puberulent or subglabrous; blade adaxially dark green, broadly ovate-oblong, 14–16 × 20–30 mm, thickly papery, abaxially arachnoid, soon glabrescent, adaxially glabrous, veins prominent on both surfaces, base cordate, margin irregularly repand-denticate, apex rounded, mucronate. Stem leaves bractlike, ovate-lanceolate, 2–3 cm × 4–6 mm, many veined, sparsely arachnoid, glabrescent, apex acuminate. Capitula large, 5–22, arranged in a terminal or compound corymb; peduncles 1–3.5 cm, stout, fulvous arachnoid; bracteoles 2 or 3, linear-lanceolate, 6–10 × 1–1.5 mm. Involucres obconic-campanulate, 13–15 × 6–10 mm; phyllaries 8, green, linear-oblong or linear-lanceolate, ca. 15 × 2–3.5 mm, herbaceous, glabrous or subglabrous, with puberulent tips and broadly scarious margins, obscurely 3–5-veined, acipitellate. Ray florets 5 or 6, yellow, with 8–8.5 mm tube; lamina linear-oblong, 15–18 × 3–3.5 mm, 6- or 7-veined, apically minutely 2- or 3-dentate. Disk florets numerous; corolla yellow, 1.2–1.3 cm, with 5–5.5 mm tube and funnelform limb; lobes oblong-lanceolate, ca. 2 mm, aciculate acuminate; anthers oblong, 4–4.5 mm, shortly obtusely caudate, appendages ovate-oblong; style branches ca. 1.5 mm. Achenes cylindrical, 5–6 mm, glabrous, ribbed. Pappus white, 1.3–1.5 cm, scabrid. Fl. Sep–Nov.

- W Hubei (near Yichang).


**革叶华蟹甲** ge ye hua xie jia

Rhizomes fusiform, 5–6 mm in diam., subglabrous, with numerous fibrous roots. Stem solitary, erect or ascending, often flexuous, 2–3 mm in diam. at base, leafless in lower part, 15–40 cm tall, sparsely puberulent or subglabrous. Radical and lower leaves fallen by anthesis. Stem leaf petiole 2.5–6 cm, sparsely puberulent, expanded and somewhat amplexicaul at base; blade abaxially pale green or purplish, adaxially dark green, suborbicular or subflabelliform, 2–4 × 3–6 cm, leathery or subleathery, abaxially fuscous puberulent or glabrescent, adaxially glabrous, basally palmately 7–9-veined, veins distinctly prominent abaxially, base truncate or weakly cordate, rarely broadly cuneate, margin coarsely palmately dentate-lobulate with apically cartilaginous-mucronate teeth, ± revolute. Upper stem leaves progressively smaller with shorter petioles. Uppermost leaves bractlike, lanceolate or linear-lanceolate, adaxially dark green, ovate or ovate-cordate, 10–16 × 10–15 cm, leathery, abaxially puberulent or glabrescent, adaxially sparsely hispidulous or pentagonal, 8–15 × 9–20 cm, leathery, abaxially fuscous puberulent on veins or glabrescent, basally palmately 7–9-veined, veins distinctly prominent abaxially, base truncate or weakly cordate, rarely broadly cuneate, margin coarsely palmately dentate-lobulate with apically cartilaginous-mucronate teeth, ± revolute. Upper stem leaves progressively smaller with shorter petioles. Uppermost leaves bractlike, lanceolate or linear-lanceolate, apex acute or subobtuse. Anthers linear-oblong, ca. 3.5 mm, subobtusely caudate; appendages ovate-oblong. Style branches ca. 1.5 mm, papillose, obtuse. Achenes cylindric, ca. 3 mm, glabrous, ribbed. Pappus white, sometimes rubescence, 5–6 mm. Fl. Jul–Aug, fr. Oct.

- Grassy slopes, cliffs, roadides, forest margins; 900–3200 m. Shaanxi, Sichuan, Xizang, Yunnan.


双花华蟹甲 shuang hua hua xie jia


华蟹甲 hua xie jia


Rhizomes tuberiform, 1–1.5 cm in diam., with numerous fibrous roots. Stems robust, fistulose, 50–100 cm tall, 5–6 mm in diam., simple, sparsely arachnoid when young, or glabrous at base, puberulent with brown hairs in upper parts. Lower stem leaves fallen by anthesis, petiolate. Petiole of median stem leaves 3–6 cm, expanded and subamplexicaul at base, sparsely puberulent or subglabrous; blade of median stem leaves adaxially dark green, ovate or ovate-cordate, 10–16 × 10–15 cm, thickly papery, abaxially puberulent and sparsely arachnoid, adaxially sparsely adpressed hispidulous at least on veins, distinctly pinnately veined, base truncate or weakly cordate, margin deeply pinnatisect with 3 or 4 lateral lobes on each side, apex mucronate; lateral lobes subopposites, narrowly to broadly cuneate, with oblique puberuly

岐笔菊属 qi bi ju shu

Chen Yilin (陈艺林 Chen Yi-ling); Bertil Nordenstam, Charles Jeffrey

Herbs, perennial, rhizomatous. Rhizomes woody, with fibrous, tomentose roots. Stems erect, leafy. Leaves alternate, stem leaves petiolate, strongly 3-veined from above base. Capitula homogamous, discoid, axillary to upper leaves, solitary or paired; pedunculate; peduncles slender, divaricate, minutely multibracteolate in upper part. Involucres cylindrical, minutely calyculate. Receptacle subconvex, areolate; phyllaries 10 or 11, linear or linear-lanceolate, subleathery, with scarious margins. Florets 15 or 16, all discoid, bisexual, fertile; corollas yellow, actinomorphic; tubular with funnelform limb, 5-lobed, lobes oblong-lanceolate. Anthers linear, exserted from corolla, basally long caudate, appendages lanceolate; endothelial cell wall thickenings strictly polar. Antheropodia long, narrow, without enlarged basal cells, as broad as filaments, shorter than anther tails. Ovary cylindrical, glabrous. Style branches with confluent stigmatic areas, abaxially and apically long papillose; papillae divided at apex into 2 brushlike lobes. Pappus of numerous capillary-like hairs, many seriate, barbellate.

● One species: China.

In habit and the shape of the capitula, the single species of Dicercoclados is very similar to some species of Synotis, such as S. sinica; however, the strongly 3-veined leaves, cymidancheropodia, and completely polarized endothelial tissue cell wall thickenings place it in the subtribe Tussilagininae and ally it firmly to Parasenecio. The apically bipenicillate style branches and its habit readily distinguish it from the latter.


岐笔菊 qi bi ju

Roots densely tomentose. Stems to 100 cm tall, ascending at base, leafless in lower part, leafy above, simple or branching in upper part, sparsely pubescent at young, glabrescent. Leaves shortly petiolate, lower leaves withered and fallen by anthesis; median leaves rather numerous; petiole 3–5 mm, sparsely pubescent, not winged, not auriculate; blade abaxially paler, adaxially deep green, oblong-lanceolate or lanceolate, 5–9 × 0.8–1.8 cm, leathery, abaxially glabrous, adaxially glabrous except for sparsely puberulent main veins and margins, prominently 3-veined from above base, main veins conspicuously impressed, base cuneate, margin remotely mucronulate-dentate and when dry somewhat revolute, apex acuminate or acuminate-caudate. Upper leaves similar but gradually smaller upward. Capitula solitary or paired in upper leaf axils; peduncles 1–2.5 cm, slender, divaricate, densely ferruginous puberulent, when paired bracteate at base, minutely and rather closely 7–9-bracteolate in upper part, sparsely puberulent; bracteoles linear-subulate, 2–3 mm, apically incurved. Involucres cylindric, 7–9 × 3–5 mm, calyculate; bracteoles of calyculus 5 or 6, linear-subulate, minute; phyllaries 10 or 11, linear or linear-lanceolate, 1–2 mm wide, subleathery, glabrous, margin broadly scarious, apically acute and sparsely puberulent. Florets 15 or 16; corolla yellow, ca. 7 mm, with 2–2.5 mm tube and narrowly funnelform limb; lobes oblong-lanceolate, ca. 1.5 mm, apically papillose, acute. Anthers linear, ca. 5 mm, prominently caudate, tails 2–3 × as long as antheropodia. Ovary cylindric, ca. 0.5 mm, glabrous. Style branches ca. 1.5 mm, truncate, with papillae divided at apex into 2 brushlike lobes. Pappus white, ca. 6.5 mm. Fl. Sep.

● Probably extinct. Guizhou (Guiding).


蟹甲草属 xie jia cao shu

Chen Yilin (陈艺林 Chen Yi-ling); Bertil Nordenstam, Hiroshi Koyama

Herbs, perennial. Rhizomes robust, erect or horizontal, with numerous fibrous roots. Stem solitary, erect, usually striate or sulcate, glabrous, arachnoid, or glandular puberulent. Leaves alternate, petiolate, simple or palmately or pinnately lobed, serrate. Capitula small or medium-sized, discoid, homogamous, all bisexual, fertile, few to numerous flowered, terminal or axillary, racemose or paniculate, pedunculate or subsessile, often calyculate. Involucres cylindric or narrowly campanulate, rarely campanulate. Phyllaries uniseriate, free. Receptacle flat, paleaceous or not. Florets few to numerous; corolla yellow, white, or orange, tubular, with slender tube and narrowly campanulate or broadly tubular limb; lobes 5, lanceolate or ovate-lanceolate; anthers sagittate or oblong-lanceolate at base; antheropodium cylindric, filaments slender; style branches apically truncate or rather dilated with unequal papillae. Achenes cylindric, glabrous, ribbed. Pappus of capillary-like bristles, white, sordid white, or sordid fulvous-brown.

About 60 species: mainly in E Asia and the Sino-Himalayan region, also across Russia and one species in the Aleutian Islands; 52 species (43 endemic) in China.

1a. Leaves large, orbicular or orbicular-cordate, palmately divided, petioles basally amplexicaul, shortly vaginate

(1. P. sect. Taimingasa) ............................................................................................................................................... 1. P. firmus

1b. Leaves large or medium-sized, not orbicular or orbicular-cordate, simple or divided, petioles basally not vaginate.

2a. Radical leaves persistent, stem leaves 1, rarely 2, or bracteal-leaflike; capitulum 3 or 4, or more; involucres campanulate or narrowly campanulate, phyllaries 8–10; florets 10–28 (2. P. sect. Parasenecio).
3a. Plants densely glandular pubescent; radical leaves broadly cordate, obtuse, or suborbicular; stem leaves 1, rarely 2, sessile or subsessile; capitula pendulous; phyllaries 8 or 9; florets 10–16, corolla white or pink-white ................................................................. 2. P. forrestii

3b. Plants densely brown pubescent; radical leaves ovate or ovate-orthic, stem leaves few, bracteal-leaflike, shortly petiolate; capitula erect; phyllaries 9 or 10; florets 28, corolla yellow ......................................................... 3. P. begonifolius

2b. Radical leaves withered by anthesis, or if persistent then florets 5; stem leaves few to numerous; capitula few to numerous, paniculate or racemose-paniculate; involucres cylindrical or narrowly campanulate; phyllaries 3–10, rarely more; florets (2 or)3–5(–8) or more.

4a. Involucres cylindric, 2–5 mm; phyllaries 4–6; florets 2–6; leaves ovate or broadly ovate-cordate, irregularly coarsely toothed or shallowly 3–10-lobed; pappos not winged, basally not expanded (3. P. sect. Koyamacalia) .... 4. P. chola

4b. Involucres cylindrical or campanulate, more than 4 mm; phyllaries 3–8, rarely more; florets 3–15, rarely more; leaves polymorphic, irregularly coarsely toothed, shallowly lobed to divided; pappos winged or not, basally auriculate or not auriculate.

5a. Stem leaves numerous; leaf blade palmately divided; phyllaries 3–5, rarely 7 or 8; florets 3–5, rarely 10–14 (5. P. sect. Delphinifolii).

6a. Leaf blade palmately 5–7-lobed, lobes obovate, oblong, or ovate-oblong.

7a. Leaf blade basally hastate, lobes broad, apically caudate or long acuminate; peduncles ca. 1 mm, glandular puberulent; phyllaries and florets 5 ................................................................. 47. P. delphinifolius

7b. Leaf blade basally subcordate, lobes narrow, apically acute; capitula sessile, brown puberulent; phyllaries and florets 3 ................................................................. 48. P. pilgerianus

6b. Leaf blade palmately deeply 5–7-sect, lobes lanceolate or oblong-lanceolate to linear, rarely obovate or spatulate.

8a. Leaf blade broadly ovate, palmately deeply sect, lobes obovate or spatulate, lateral lobes 2-fid to deeply sect, both surfaces glabrous; phyllaries and florets 3; pappos white ................................................................. 52. P. tripteris

8b. Leaf blade ova-oblong, pentagonal-cordate, or orbiculate-ovate, lobes lanceolate or oblong-lanceolate to linear.

9a. Leaves pinnate-palmately divided, lobes pinnately lobulate or 2–4-denticulate; phyllaries 4; (plants of Sichuan, Xizang, Yunnan) ................................................................. 51. P. palmaisectus

9b. Leaves palmately lobed, lateral lobes often 1-lobulate or finely toothed; phyllaries 5, 7, or 8; (plants of Henan, Hubei, Shaanxi).

10a. Leaf blade 10–20 × 12–24 cm, 5–7-lobed; phyllaries 7 or 8; florets 10–14; achenes 5–6 mm; pappos red-brown ................................................................. 49. P. sinicus

10b. Leaf blade 16–27 × 15–35 cm, (5 or)6–9-lobed; phyllaries 5; florets 5; achenes ca. 3 mm; pappos white ................................................................. 50. P. dissectus

5b. Stem leaves few to numerous, triangular, triangular-ovate, reniform, polygonal, or ovate-cordate, coarsely toothed or shallowly lobed, adaxially glabrous, pubescent, or densely tomentose.

11a. Leaves adaxially glabrous or pubescent; capitula few to numerous, pedunculate or not; pappos white or red-brown (3. P. sect. Koyamacalia).

12a. Capitula few, or solitary at apex and axillary in upper leaves, pendulous; involucres campanulate, 5–10 mm in diam.; phyllaries 8–10; florets numerous, ca. 38; leaves triangular; pappos not winged ................................................................. 5. P. deltophyllus

12b. Capitula numerous or more in terminal racemes or panicles; involucres cylindrical or narrowly campanulate, (1–)3–5 mm in diam.; phyllaries 3–8; florets few; leaves not triangular; pappos winged or not.

13a. Capitula numerous, small; involucres cylindric, 1–2 mm in diam.; phyllaries and florets 3–5; leaf blade polygonal or reniform, 5–7-lobed or coarsely toothed; corolla white or yellow.

14a. Capitula sessile; involucres ca. 5 × 1 mm; phyllaries and florets 3 or 5; corolla white; pappos sordid white or pale yellow-brown ................................................................. 18. P. ambigus

14b. Capitula pedunculate; involucres 6–8 × 1.5–2 mm; phyllaries and florets 5; corolla white or yellow; pappos white or yellow-brown.

15a. Capitula racemose or compound racemose; peduncles short or very short; involucres cylindric; phyllaries obtuse or rounded; pappos white .................................................. 19. P. ainsliaeflourus

15b. Capitula laxly racemose or compound racemose; peduncles 1–2 mm; involucres narrowly campanulate; phyllaries acute; corolla yellow; pappos pale yellow-brown ....... 20. P. kangxianensis

13b. Capitula more numerous, larger; involucres 3–5 or 10–20 mm in diam.; pappos white, sordid white, or red-brown.

16a. Involucres campanulate, 10–15 × 10–20 mm; phyllaries 7–12; florets 8–38; pappos red-brown.

17a. Leaves broadly triangular, 3–5-lobed, lobes triangular, basal lobes sometimes rudimentary; capitula smaller; involucres narrowly campanulate, 10–12 × 5–10 mm; phyllaries 7 or 8; florets 8–10 ......................................................................................................................... 21. P. rubescens
17b. Leaves pentagonal-hastate, lateral lobes small, narrowly triangular or obscure; capitula large; involucres campanulate, 13–15 × 17–20 mm; phyllaries 12; florets numerous (ca. 38) .... 22. P. matsudae

16b. Involucres 5–8(–10) mm; phyllaries and florets 4–8, rarely more; pappus white or sordid white.

18a. Petioles not winged, basally not expanded into auricles.

19a. Leaf axils with buds.

20a. Leaf blade hastate-triangular, apex acuminate or long acuminate, base cordate, both surfaces scaly puberulent; phyllaries 7 or 8; florets 10–13; pappus white ......................... 14. P. nokoensis

20b. Leaf blade broadly triangular-hastate or ovate-triangular, apex long acuminate or caudate, base hastate or broadly cordate, adaxially densely glandular pubescent; phyllaries and florets 5; pappus brown or purple-brown ........................................................... 15. P. hastiformis

19b. Leaf axils without buds.

21a. Leaf blade triangular-hastate, apex acute or acuminate, base broadly cordate, both surfaces glabrous or subglabrous; phyllaries 5; florets 5 or 6 ....................................................... 16. P. albus

21b. Leaf blade pentagonal-reniform, apex acute or rounded-obtuse, base deeply cordate, abaxially hispidulous, adaxially on veins puberulent; phyllaries 8(or 9); florets 16–19 ..... 17. P. vespertilio

18b. Petioles winged.

22a. Petioles narrowly or indistinctly winged, basally not expanded into auricles.

23a. Capitula pendulous, arranged in pyramidal panicles; phyllaries 7 or 8, glandular pubescent; florets 8–15(–20); blade triangular-hastate, adaxially densely or laxly pubescent; petioles narrowly winged ............................................................. 6. P. hastatus

23b. Capitula erect, arranged in broadly pyramidal panicles with long divaricate branches; phyllaries 5 or 6; florets 5–8; blade triangular-lanceolate, apex acuminate or caudate, adaxially laxly pilose on veins or subglabrous; petioles indistinctly winged ...................... 7. P. lancifolius

22b. Petioles broadly winged, base often expanded and auriculate.

24a. Plants to 2–3 m tall, stems robust; leaves broadly triangular or triangular-hastate, petioles with 1.5–2 cm wide wings, base expanded and amplexicaul-auriculate; capitula numerous, 250–350, in broad pyramidal panicles; phyllaries 4 or 5; florets 5–7 ........... 8. P. komarovianus

24b. Plants 30–100 cm tall; stems slender; leaves reniform or triangular-reniform, petioles large or small auriculate; capitula more numerous, racemose or paniculate; phyllaries 4 or 5; florets 4–7.

25a. Leaf blade oblate-reniform, thinly papery, retuse or subtruncate, triangular-rostrate at center, margin irregularly coarsely toothed stipitate glandular hairy; petioles basally entire or dentate auriculate; phyllaries 4; florets 5 .......................................................... 9. P. maowenensis

25b. Leaf blade not oblate-reniform, papery, apically constricted long apiculate, with regular teeth or with concave teeth at subbasal margins glandular puberulent; phyllaries 5; florets 4–7(or 8).

26a. Leaves reniform or triangular-reniform, both surfaces glabrous.

27a. Phyllaries 4–8 mm, 1/3–1/2 as long as corolla and pappus by anthesis; capitula racemose, rarely paniculate; petioles basally expanded and small auriculate ............. 10. P. auriculatus

27b. Phyllaries 8–12 mm, subequal to or rather shorter than corolla by anthesis; capitula laxly or densely paniculate; petioles basally with 1.5–2 cm wide auricle ............................................................. 11. P. praetermissus

26b. Leaves triangular-hastate or ovate to broadly ovate, adaxially hairy.

28a. Median stem leaves triangular-hastate, lateral lobes triangular, irregularly repand-dentate, adaxially puberulent on veins; petioles toward base gradually expanded into ovate- orbicular or orbicular, 1.5–2.5 cm wide auricle; auricules entire or remotely toothed; phyllaries 5; florets 5 or 6 .................................................... 12. P. gansuensis

28b. Stem leaves broadly ovate or broadly cordate, adaxially sparsely arachnoid or subglabrous; petioles with 5–10 cm wide wings, basically expanded into a large amplexicaul auricle; phyllaries (3 or)5; florets 3 or 4(or 5) .............................................. 13. P. otopteryx


29a. Plants glabrous or sparsely arachnoid in upper part; leaves triangular, ovate-triangular, or hastate-triangular, distinctly prominently 3-veined; anthers basally long caudate.

30a. Leaves divided.

31a. Leaf blade obovate-spatulate, lyrate- pinnate; lobes ovate, oblong, or obovate-triangular, coarsely toothed, adaxially arachnoid-tomentose; petioles broadly winged, basally expanded into auricle; phyllaries and florets 5 or 6 .............................................................. 32. P. cyclopus
31b. Leaf blade 3–5-lobed to medially sect.
32a. Leaves reniform-pentangular or broadly ovate-pentangular; petioles not winged, often with many globose bulblets in upper branches of synflorescence; phyllaries and florets 4 or 5 ................................................................. 29. P. quinquelobus
32b. Leaves reniform-triangular or broadly ovate; petioles winged, but without bulblets.
33a. Leaf blade broadly triangular, 3-lobed, central lobe 3-fid, lateral lobes 2-fid, abaxially white arachnoid-tomentose; petioles narrowly winged, basally without auricle; phyllaries and florets 4 or 5 ................................................................. 30. P. rockianus
33b. Leaf blade reniform-triangular or broadly ovate, medially 3–5-sect, lobes lobulate or coarsely toothed, abaxially white arachnoid-tomentose, adaxially densely brown hispidulous; petioles broadly winged, basally auriculate; phyllaries 5; florets 8(–10) ................................................................. 31. P. souliei
30b. Leaves not divided.
34a. Petioles winged, often expanded into subamplexicaul auricle; capitula pendulous.
35a. Leaf blade ovate-triangular to broadly triangular, stiffly papery; petioles broadly winged, basally expanded into broad or narrow auricle; phyllaries 3; florets 5 or 6 ................................................................. 23. P. latipes
35b. Leaf blade triangular or triangular-hastate, thick, abaxially arachnoid-tomentose; petioles with 4–15 mm in diam. orbicular auricles; phyllaries 6–8; florets 9–12(–14) ...................................................... 24. P. lidjiangensis
34b. Petioles not winged, base not or ± expanded, but without auricles; capitula ascending or pendulous.
36a. Stem leaves numerous, crowded at middle part of stem; leaves ovate or reniform-triangular, margin with cartilaginous coarse teeth; capitula laxly racemose, but not secund; phyllaries 3; florets 2 or 3 ................................................................. 27. P. tenianus
36b. Stem leaves 3 or 4, often crowded at middle to lower part of stem; capitula secund.
37a. Radical leaves withered and fallen by anthesis; leaf blade membranous or submembranous, broadly ovate or ovate-oblate, abaxially densely white tomentose; florets (6–)8 or 9 ......... 25. P. taliensis
37b. Radical leaves persistent at anthesis; leaf blade papery, ovate-triangular, broadly ovate, or rhombic, abaxially not white tomentose; florets 5.
38a. Stems slender, glabrous; leaves crowded near base of stem, ovate-orbicular or cordate, abaxially becoming purple when dry; glabrous; capitula spicate ........................................ 26. P. jiulongensis
38b. Stems slender, glabrous; leaves ovate-oblate, abaxially densely white tomentose; florets (6–)8 or 9 ................ 25. P. taliensis
39a. Leaf blade ovate-triangular, ovate, or cordate, usually basally 3-veined; phyllaries (2 or)3–5; florets 1–5, rarely more.
40a. Capitula numerous, spreading or pendulous, racemose or paniculate; phyllaries (2 or)3; florets 1–3, rarely 4.
40b. Capitula laxly pyramidal-paniculate, pendulous, secund; leaves ovate-triangular, abaxially white or gray-white arachnoid; petioles not winged ....................................................... 35. P. morrisonensis
41a. Phyllaries 2; floret 1; leaves 4, lax on stem, subtriangular-reniform, abaxially densely lanate, adaxially crisped-volute hairy; petioles not winged ................................................. 35. P. morrisonensis
41b. Phyllaries 2 or 3(or 4); florets 3(or 4); leaf blade ovate-triangular or broadly cordate; petioles winged or not.
42a. Capitula laxly pyramidal-paniculate, pendulous, secund; leaves ovate-triangular, abaxially white or gray-white arachnoid; petioles not winged ....................................................... 33. P. roborowskii
42b. Capitula narrowly racemose-paniculate, spreading; leaves broadly cordate, abaxially sparsely arachnoid, adaxially sparsely hairy; petioles narrowly winged ............. 34. P. xinjiangensis
40b. Capitula laxly paniculate or narrowly racemose-paniculate; phyllaries 5; florets 5 or 6, rarely 10–13.
43a. Stem leaves 4 or 5; petioles winged.
44a. Leaves membranous, broadly ovate to ovate-rhombic, acute, angular coarsely toothed; petioles distinctly winged ................................................................. 36. P. profundorum
44b. Leaves thinly papery, broadly ovate or ovate-triangular, caudate-accuminate, serrulate; petioles indistinctly winged or not winged; uppermost leaves bractlike .............................. 37. P. phyllolepis
43b. Stem leaves 2–4(or 5); petioles not winged.
45a. Stems slender, glabrous; stem leaves 2 or 3, broadly cordate-orbicular or ovate-cordate-orbicular or ovate-cordate, abaxially violet or purplish, sparsely arachnoid; capitula broadly paniculate; involucres 12–14 × 1.5–2 mm, glabrous; florets 5 or 6 ......... 38. P. ianthophyllus
45b. Stems robust, white arachnoid; stem leaves 4 or 5, ovate-triangular or triangular- hastate, abaxially white arachnoid; capitula narrowly paniculate; involucres 8–10 × 4–5 mm, outside white lanate; florets 10–13 ............................................... 39. P. leucocephalus

39b. Leaf blade broadly ovate-cordate or cordate, palmately 5–7-veined, abaxially arachnoid-tomentose or glandular hairy; phyllaries 3–5(or 6); florets (2–)5–8(–10).

46a. Phyllaries 3 or 4; florets 2–4; plants adpressed gray-white arachnoid-lanate, intermixed glandular puberulent .................................................................................................... 40. P. longispicus

46b. Phyllaries 5; florets 5–8(–10); plants arachnoid or red-brown glandular pubescent.

47a. Axillary scale buds ovoid-globose, brown tomentose; capitula racemose, upper part laxly bracteate, often with bulblets; phyllaries 3 or 6; florets 8–10 ............................................... 41. P. bulbiferoides

47b. Bulblets absent from leaf axils and bracts; capitula spicate-racemose or paniculate.

48a. Stems, petioles, and involucres arachnoid or later ± glabrescent.

49a. Capitula spicate-racemose; involucres 12–14 mm; florets 5–8; petioles 5–14 cm, not winged, basally not expanded ................................................................................... 42. P. petasitoides

49b. Capitula laxly narrowly paniculate; involucres ca. 10 mm; florets 7 or 8; petioles indistinctly narrowly winged, basally expanded and subamplexicaul ........................................ 43. P. hwangshanicus

48b. Stems, petioles, and involucres red-brown or brown villous or knotted glandular pubescent.

50a. Lower stems glandular pubescent, upper part white arachnoid or hispidulous; peduncles 3–4 mm; corolla orange ..................................................................................... 46. P. dasysthrys

50b. Stems, petioles, and phyllaries red-brown or brown pubescent; peduncles very short or capitula subsessile; corolla yellow.

51a. Leaf blade broadly ovate-cordate or reniform, triangularly 5-lobed or deeply serrate, red-brown hyaline glandular hairy; petioles 5–10 cm, basally not expanded ...................... 44. P. rufipilis

51b. Leaf blade reniform or ovate, undulate-lobed, lobes broadly triangular, abaxially arachnoid or puberulent, adaxially brown puberulent; petioles 10–15 cm, basally expanded, subamplexicaul ...................................................... 45. P. tsinlingensis


Leaves large, few, usually 2 or 3; blade orbicular, palmately medially sect; petioles amplexicaul, shortly sheathed at base. Involucre narrowly campanulate; phyllaries 3–5. Florets 5–10. Pappus sordid white.

Five species: China, Japan, Korea; one species in China.


Stems erect, striate, to 2 m tall, robust, 1.5–2 cm in diam. at base, terete, glabrous. Radical leaves long petiolate, large; petiole 22–28 cm, stout, crisp-pubescent; blade abaxially pale green, adaxially green, orbicular or orbicular-cordate, ca. 30 × 35–100 cm, palmately mediately cleft, base cordate, apex acute; lobes 11–15, triangular-ovate, adaxially glabrous, reticulate veined, abaxially puberulent on veins, margin irregularly mucronulate-serrate, apically acute. Stem leaves small; petiole short, 3–8 mm, stout; leaf blade ovate-triangular or ovate-oblong. Peduncles 10–12 × 2–3 mm, with linear bracteoles. Phyllaries 5, linear-lanceolate, 10–12 × 1.5–2 mm, sparsely puberulent or subglabrous, with membranous margins, apex obtuse or slightly acute. Florets 5–10; corolla yellow, 8–10 mm, tube slender, ca. 3.5 mm, limb narrowly tubular; lobes 5, linear-lanceolate, ca. 2 mm. Anthers basally caudate; style branches excurved, apex truncate, penicillate-papilllose. Achenes yellow-brown, cylindric, 5–6 mm, glabrous, ribbed. Pappus white or sordid white, ca. 7 mm. Fl. Aug–Sep, fr. Oct.

Forest understories, forest margins, open spaces; 800–1100 m. Jilin [N Korea].

2. Parasenecio sect. Parasenecio


Stems erect, striate, to 2 m tall, robust, 1.5–2 cm in diam. at base, terete, glabrous. Radical leaves long petiolate, large; petiole 22–28 cm, stout, crisp-pubescent; blade abaxially pale green, adaxially green, orbicular or orbicular-cordate, ca. 30 × 35–100 cm, palmately mediately cleft, base cordate, apex acute; lobes 11–15, triangular-ovate, adaxially glabrous, reticulate veined, abaxially puberulent on veins, margin irregularly mucronulate-serrate, apically acute. Stem leaves small; petiole short, 3–8 mm, stout; leaf blade ovate-triangular or ovate-oblong. Peduncles 10–12 × 2–3 mm, with linear bracteoles. Phyllaries 5, linear-lanceolate, 10–12 × 1.5–2 mm, sparsely puberulent or subglabrous, with membranous margins, apex obtuse or slightly acute. Florets 5–10; corolla yellow, 8–10 mm, tube slender, ca. 3.5 mm, limb narrowly tubular; lobes 5, linear-lanceolate, ca. 2 mm. Anthers basally caudate; style branches excurved, apex truncate, penicillate-papilllose. Achenes yellow-brown, cylindric, 5–6 mm, glabrous, ribbed. Pappus white or sordid white, ca. 7 mm. Fl. Aug–Sep, fr. Oct.

Forest understories, forest margins, open spaces; 800–1100 m. Jilin [N Korea].

Two species: China.


Rhizomes slender, woody, scabrous. Stem solitary, 60–80 cm tall, striate, densely glandular pubescent at base, with laxly panicleate synflorescence branches in upper part, densely glandular pubescent. Leaves petiolate, often crowded in lower part, usually 3. Radical leaf 1, large; petiole 3–5 cm, not winged, densely pubescent; leaf blade cordate, 10–12 × 14–17 cm, abaxially densely villous on veins, adaxially villous, ± reticulate, apex obtuse. Stem leaves usually 1, rarely 2, similar to radical leaves but smaller, sessile or subsessile, elliptic-triangular. Capitula numerous, pendulous, narrowly paniculate; peduncles 0.5–5 cm, puberulent; bracteoles 1–4. Involucres campanulate, 1.3–1.4 cm; phyllaries 8 or 9, subbiseriate; outer phyllaries 3 or 4, larger, puberulent. Florets 10–16; corolla pale pink-white. Anthers caudate at base. Style branches excurved, truncate, penicillate-papillose. Achenes cylindric, 5–6 mm, glabrous, 5-ribbed. Pappus white, ca. 8 mm. Fl. Aug, fr. Sep–Oct.

Plants densely brown multicellular pubescent throughout, with numerous, stout, fibrous roots. Stem solitary, ca. 50 cm tall, erect or curved from base, striate, with 1 radical leaf and few scaly leaflets. Radical leaves long petiolate; petiole 7–15 cm, stout, not winged, densely fulvous-brown tomentulose, base ± expanded, slightly amplexicaul; blade abaxially pale green, adaxially deep green, broadly ovate or ovate-orbicular, 15–20 × 12–13 cm, papery, both surfaces red-brown puberulent, basally 7–9-veined, lateral veins branched, base deeply cordate, margin irregularly mucronulate-serrate, apex acute. Stem leaves few, shortly petiolate, bracteal-leaflike, lanceolate, ca. 2 cm. Capitula usually 3 or 4, terminal or on synflorescence branches arranged in narrow panicle; peduncles erect, 5–15 mm, densely pubescent; bracteoles 3–5, linear. Involucres narrowly campanulate, 7–9 × 1–1.5 mm, puberulent, margin narrowly scarios, apically acute or acuminate; phyllaries 9 or 10. Florets 28, longer than involucres; corolla yellow, 9–10 mm, tube 3–4 mm, slender, limb broadly tubular; lobes lanceolate, ca. 2 mm. Anthers caudate at base. Style branches excurved, truncate, papillose. Achenes cylindric, glabrous, ribbed. Pappus white, ca. 1 cm. Fl. Nov–Dec.

- Forest understoreys; 2300–3700 m. SW Sichuan, Yunnan.
- Forest understoreys on slopes, forest margins, roadsides; 700–2200 m. Chongqing (Chengkou), W Hubei (Badong), E Sichuan (Daba Shan).


*Cacalia begoniifolia* (Franchet) Handel-Mazzetti.

About 26 species: Eurasia from Russia to E Asia; 19 species (14 endemic) in China.


- Forest understoreys; 2300–3700 m. SW Sichuan, Yunnan.
- Forest understoreys on slopes, forest margins, roadsides; 700–2200 m. Chongqing (Chengkou), W Hubei (Badong), E Sichuan (Daba Shan).


Petiole basally expanded into an amplexicaul auricle or not; leaf blade ovate or broadly ovate-cordate, 3-lobed or coarsely toothed. Involucres cylindric, 2–4 mm; phyllaries 4 or 5. Florets 2–5.

One species: China, India (Sikkim), Kashmir, Nepal.


Rhizomes woody, densely yellow-brown tomentulose on collar, with few fibrous roots. Stem solitary, erect, 50–100 cm tall, sulcate, simple or inflorescence-branched in upper part, sparsely puberulent in lower part, densely yellow-brown pubescent in upper part. Leaves long petiolate; petiole not winged, 7–11 cm, sparsely pubescent, not expanded at base; blade abaxially pale green, adaxially green, ovate or ovate-cordate, 10–18 × 9–17 cm, abaxially yellow-brown puberulent on veins, adaxially sparsely adpressed hairy, basally 3–5-veined, lateral veins branched from midvein, base cordate or subtruncate, margin irregularly coarsely, triangularly mucronulate-toothed, rarely 3–10-lobed, apex acute or acuminate. Capitula numerous, small,
terminal and in upper leaf axils, crowded in paniculate racemes, sessile or subsessile, densely yellow-brown pubescent. Involucres cylindric, 2–5 mm; phyllaries 4–6, linear, 5–6 mm, densely puberulent, margin scarious, apically obtuse. Florets 2–6; corolla yellow, shorter than involucres. Achenes cylindric, ca. 2 mm, glabrous, ribbed. Pappus pale brown. Fl. Jul–Aug.

Forest understories; 3300–3800 m. S Xizang (Gyirong) [India (Sikkim), Kashmir, Nepal].


Leaves reniform or triangular-ovate to hastate, margin toothed or shallowly lobed. Involucres cylindric or narrowly campanulate; phyllaries 3–8, rarely 10. Florets 3–5, rarely more. Pappus white, rarely yellow-brown.

About 20 species: China, N Japan, Korea, Mongolia, Russia; 13 species (nine endemic) in China.


Rhizomes robust, elongate with numerous fibrous roots. Stem solitary, erect, 50–80 cm tall, distinctly sulcate, sparsely pubescent or subglabrous. Leaves petiolate; lower leaves withered and fallen; petiole 3–6 cm, not winged, white crisped and glandular hairy. Median leaves triangular, 4–10 × 5–7 cm, abaxially sparsely puberulent, adaxially glabrous, basally 3–5-veined, lateral veins upward divaricate, base truncate or cuneate, margin irregularly undulate-toothed, teeth obtuse and mucronulate, apex acute. Upper leaves shortly petiolate, lanceolate. Capitula few to 10, pendulous, terminal or in upper leaf axils, corymbose; peduncles 1–3 cm, sparsely crisped- and glandular hairy; bracteoles 3–8, linear. Involucres campanulate, 6–8 × 5–10 mm; phyllaries 8–10, oblong, ca. 8 × 2–3 mm, outside sparsely white pubescent and glandular hairy, bartbate, with broad scabrous margins, apex acuminated. Florets numerous (ca. 38); corolla yellow or yellow-brown, 5–7 mm, with ca. 3 mm tube and campanulate limb; lobes lanceolate, apex acuminate. Anthers caudate at base. Style branches slender, excurred, apically truncate, papillose. Achenes pale brownish, cylindric, 6–8 mm, glabrous, ribbed. Pappus white, equal to achenes or shorter. Fl. Jul–Aug, fr. Sep–Oct. 2n = 40, 60.

Forest understories, slopes, grasslands, forest margins, roadsides. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shanxi [N Japan, Korea, Mongolia, Russia (Far East)].

6. Parasenecio hastatus (Linnaeus) H. Robinson & Brettell, *Senecio sagittatus* Schultz Bipontinus; *Cacalia hastata* var. pubescens (Ledebour; *Hasteola hastata* (Linnaeus) Pojarkova; *Koyamacalia hastata* (Linnaeus) H. Robinson & Brettell; *Senecio sagittatus* var. *hastatus* (Hasteola) Pojarkova; *Cacalia hastata* var. *glabra* Ledebour; *Senecio sagittatus* var. *hastatus* (Hasteola) Pojarkova; *Cacalia hastata* var. *glabra* Ledebour, Fl. Altaic. 4: 52. 1833.

*Senecio* hastatus Linnaeus, Sp. Pl. 2: 835. 1753; *Hasteola hastata* (Linnaeus) Pojarkova; *Cacalia hastata* (Linnaeus) H. Robinson & Brettell; *Senecio sagittatus* Schultz Bipontinus; *Cacalia hastata* var. *pubescens* Ledebour; *Hasteola hastata* (Linnaeus) Pojarkova; *Koyamacalia hastata* (Linnaeus) H. Robinson & Brettell; *Senecio sagittatus* Schultz Bipontinus; *Cacalia hastata* var. *pubescens* Ledebour; *Koyamacalia hastata* (Linnaeus) H. Robinson & Brettell; *Senecio sagittatus* Schultz Bipontinus; *Cacalia hastata* var. *pubescens* (Ledebour) Maximowicz.

Leaves abaxially and phyllaries outside densely glandular puberulent.

Forest understories, grasslands along forest margins; 1700–2300 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shanxi [N Japan, Korea, Mongolia, Russia (Far East)].

1a. Leaves abaxially and phyllaries outside densely glandular puberulent ................................ 6a. var. *hastatus*

1b. Leaves glabrous or veins sparsely puberulent; phyllaries outside glabrous or puberulent only at base ...................... 6b. var. *glaber*

6a. Parasenecio hastatus var. *hastatus*

山尖子 (原变种) shan jian zi (yuan bian zhong)
Selecions from the page:


Rhizomes short, stout, ca. 1 cm in diam., with numerous fibrous roots. Stem solitary, erect or curved in lower part, 60–65 cm tall, slender, striate, long naked in lower part, sparsely or densely yellow-brown capitulate stipitate glandular hairy. Lower leaves withered by anthesis; petiole 4–8.5 cm, not winged, expanded into an amplexicaul auricle; auricle entire or laxly toothed, with capitulate stipitate glandular hairs. Stem leaves 2, long petiolate; blade abaxially pale green, adaxially deep green, broadly reniform, 6–9 × 12–14 cm, thinly papery, both surfaces glabrous, capitulate stipitate glandular hairy, basally 3–5-veined, lateral veins upward divaricate, base deeply cordate, margin irregularly undulate coarsely toothed, large teeth angular, stiffly mucronulate, apex obtuse or subtruncate, triangular-rostrate-acute at center. Uppermost leaves reduced to bracteal leaf; bracteal leaves linear, 6–8 mm. Capitula very numerous, apically in a branched panicle; rachis and peduncles densely yellow-brown capitulate stipitate glandular hairy; peduncles 6–13 mm, slender, with 1 or 2 linear bractlets. Involucres cylindrical, 10–11 × 2–3 mm; phyllaries 4, green, linear or linear-lanceolate, 0.5–1 mm wide, outside sparsely capitulate stipitate glandular hairy, margin narrowly scarious, apically acute. Florets 5, exerted from involucres; corolla yellow, 8–9 mm, with ca. 3 mm tube and narrowly campanulate limb; lobes lanceolate, ca. 2 mm. An-
thers caudate at base. Style branches excurred, apex truncate, papillose. Achenes yellow-brown, cylindric, ca. 6 mm, glabrous, ribbed. Pappus white, ca. 7 mm. Fl. and fr. Aug.

- Open places on slopes; ca. 2800 m. Sichuan (Wenchuan).

**Parasenecio maowenensis** is similar to *P. auriculatus* but differs in the shape of leaves, the indumentum, and the number of phyllaries and florets.


**长白蟹甲草** chang bai xie jia cao


Rhizomes ascending or procumbent, 5–15 mm in diam., with numerous fibrous roots. Stem solitary, erect or slightly curved, 30–100 cm or taller, sulcate, glabrous. Radical leaves withered often by anthesis; stem leaves 4–6, thinly papery; lower leaf petiole 1.5–2(–3) × as long as blade, slender, expanded at base only, but without auricle. Lower stem leaves 1 or 2; blade reniform, 2–4 × 4–7 cm, margin with unequally sized large teeth, apex contracted and long acute or sometimes slightly retuse. Median stem leaf petiole equal to blade or 1/4–1/2 as long, basally usually expanded into a small auricle; blade reniform to triangular-reniform, 5–16 × 7–14 cm, margin with equal large teeth or teeth retuse or indistinctly toothed near base, rarely entire, apex deeply retuse or retuse, often angulate, sometimes long acuminate. Upper leaves same shape as median leaves but smaller, triangular or oblong-ovate, shortly petiolate; uppermost leaves lanceolate. Capitula very numerous, terminal, arranged in 4.5–15 cm, narrow racemes, rarely shortly branched in lower part, or few racemose; peduncles pendulous, 1.5–5 mm or 7–9 mm in lower part, slender, glandular hairy and puberulent, with setiform or lanceolate bractlets; bractlets ca. 2 mm. Involucres purple or purple-green to green, cylindrical; phyllaries 5, rarely 4, oblong, 4–8 mm, outside subglabrous, apically slightly acute. Florets 4–7; corolla yellow, 6–8 mm; tube as long as limb. Anthers exerted from corolla, basally caudate. Style branches apically truncate, papillose. Achenes yellowish, cylindrical, 3.5–5 mm, glabrous, ribbed. Pappus white, ca. 7 mm. Fl. Jun–Jul, fr. Sep.

Forest understoreys, forest margins; 1400–1600 m. Heilongjiang, Jilin, Nei Mongol [N Japan, N Korea, Russia (Far East)].


**甘肃蟹甲草** gan su xie jia cao

Rhizomes short and stout, 10–15 mm in diam., with numerous fibrous roots. Stem solitary, erect, 60–80(–100) cm, striate, sparsely puberulent or subglabrous, long naked in lower part. Leaves long petiolate, lower leaves fallen by anthesis, median stem leaves papery; petiole 5–8 cm, basally expanded into an ovate or rounded amplexicaul auricle; auricle 1.5–2.5 cm wide, entire or laxly toothed, sparsely puberulent; blade abaxially gray-green, adaxially green, triangular-hastate, 9–13 × 9–14 cm, abaxially puberulent on veins, adaxially sparsely adpressed puberulent, basally 5- or 6-veined, lateral veins upward divericate, branched, veins convex abaxially, concave adaxially, base hastate-cordate, apex acute or acuminate; central lobes large, lateral lobes triangular, upper ones long, lower ones smaller, margin irregularly undulate-toothed, teeth mucronulate. Upper leaves similar, like median stem leaves but smaller, shortly petiolate; uppermost leaves triangular-hastate to lanceolate, with broad amplexicaul auricle or sessile. Capitula numerous, apically or in upper axils racemose-paniculate; rachis and peduncles with capitate stipitate glandular hairs; peduncles 1–2 mm, with 1 or 2 linear bractlets. Involucres cylindrical, 6–7 × ca. 2 mm; phyllaries 5, purple-red, linear or linear-lanceolate, 0.5–1 mm wide, outside sparsely glandular or subglabrous, margin narrowly scarious, apically rather acute or obtuse. Florets 5 or 6; corolla yellow, 6–7 mm, with ca. 3 mm tube and broadly tubular limb, lobes lanceolate. Anthers exserted from corolla,

- Forest understoreys on slopes, thickets, shaded places by canals; 1300–2500 m. Gansu, Shaanxi.


**耳翼蟹甲草** er yì xiè jia cáo


Rhizomes not dilated, with numerous fibrous roots. Stem solitary, erect, striate, often purple in lower part, 70–100 cm tall, glabrous. Lower leaves withered by anthesis; stem leaves 4–6, long petiolate; petiole with 5–10 mm wide wings, expanded into an ampexusclial large auricle; blade abaxially gray-green, adaxially green, broadly ovate-cordate or broadly cordate, 10–16 × 11–19 cm, papery, abaxially sparsely arachnoid or subglabrous, adaxially sparsely brown glandular, 3–5-veined, lateral veins 3 or 4 pairs, upward divaricate, base cor- motive irregularly undulate-serrate, teeth mucronulate, apex acute or shortly acute. Capitula numerous, terminal, compound racemose; rachis and peduncles glandular puberulent, with 1 or 2 lanceolate-subulate bractlets at base of peduncles; bractlets 1–8 mm, spreading or pendulous. Involucres cylindrical or narrowly campanulate, 5–7 × 2–2.5 mm; phyllaries (3–)5, oblong-lanceolate, 6–7 × 1.5 mm, outside with paleaceous short hairs, margin scabrous, apically obtuse. Florets 3–5; corolla yellow-white, 7–8 mm, with ca. 3 mm tube and narrowly campanulate limb; lobes lanceolate, ca. 1.5 mm. Anthers exserted from corolla, basally long caudate. Style branches ex- curved, truncate, papilllose. Achenes brown, cylindric, 4.5–5 mm, glabrous, ribbed. Pappus white, 6–7 mm. Fl. and fr. Jul–Sep.

- Forest understoreys on slopes, forest margins, shaded places in thickets; 1400–2800 m. Henan, Hubei, Shaanxi, Sichuan.

*Parasenecio otopteryx* is similar to *P. profundorum* but differs by the shape of leaves and in having petioles broadly winged and expanded at the base into an ampexusclial auricle.


**高能蟹甲草** gāo nèng xiè jia cáo


Rhizomes obliquely ascending. Stem solitary, 45–80 cm tall, erect, 2–3.5 mm in diam., glabrous below, densely shortly crisped-pubescent above; branchlets spreading. Basal and lower leaves fallen at anthesis. Stem leaves numerous, petiolate in median leaves; petioles 2.5–5 cm, not winged, usually with axil- lary buds at base, sparsely shortly crisped-pubescent; blade abaxially pale green, adaxially green, hastate-triangular, 4–13 × 4.5–10 cm, both surfaces scaly and shortly hairy, base ± cordate, margin denticulate, apex acuminate or long acuminate; lat- eral lobes acuminate. Upper leaves smaller; uppermost leaves linear. Capitula more numerous, terminal, arranged in panicles, 8–10 mm wide; peduncles 4–10 mm, with 1 or 2 linear bract- lets, crisped-hairy. Involucres cylindric, not calyculate, 7–10 × 4–7 mm; phyllaries 7 or 8, linear-oblong, outside densely shortly crisped-hairy, margin narrowly scabrous, apically obtuse. Florets 10–13; corolla yellow, 8–9 mm, with 2.5–3 mm tube and broadly tubular limb; lobes lanceolate, ca. 1.5 mm, apex an- gularly thickened. Anthers exerted from corolla, basally sagit- tate-caudate. Style branches excurved, apex obtuse, papillose. Achenes cylindric, ca. 5 mm, glabrous, ribbed. Pappus white, ca. 8 mm, fragile. Fl. Aug–Oct.

- Forest margins on slopes; ca. 2900 m. Taiwan.

*Parasenecio nokoensis* is similar to *P. hastatus* in aspect but differs by its leaves unwinged, petioles with axillary buds at the base, phyllaries 7 or 8, and florets 10–13.


**戟状蟹甲草** jǐ zhàng xiè jia cáo

Rhizomes 10–15 mm in diam., with numerous fibrous roots. Stem solitary, erect, 80–100 cm tall, striate, long naked below, sparsely glandular shortly pubescent, densely so in upper part. Leaves crowded, long petiolate; lower leaves fallen at an- thesis; median leaf petioles not winged, 6–10 cm, expanded at base but not ampexusclial, sparsely or densely glandular shortly pubescent, sometimes with axillary ovoid scale buds; blade abaxially pale green or gray-green, adaxially dark green, broadly triangular-hastate or ovate-triangular, 10–15 × 12–15 cm, thinly papery, abaxially densely glandular shortly pubescent on veins, adaxially adpressed hispidulous, basally 3–5-veined, lateral veins upward divaricate and reticulate, base broadly cordate or hastate, apex long acuminate or caudate; lateral lobes broadly triangular, margin with long mucronulate teeth. Upper leaves smaller, similar to median leaves, or ovate-triangular, shortly petiolate; uppermost narrowly triangular to lanceolate, small. Capitula numerous apically and in upper leaf axils in lateral racemes or panicles; rachis and peduncles 1–2 mm or capitula submersile, densely capititate stipitate glandular hairy; peduncles with 1 or 2 linear bractlets. Involucres cylindric or narrowly campanulate, 10–11 × 3–4 mm; phyllaries 5, oblong-lanceolate, ca. 1.5 mm wide, outside sparsely or densely glandular puberulent, margin ciliate, narrowly scarious, apically rather acute or obtuse. Florets 5, often longer than involucres; corolla yellow, 8–9 mm, with ca. 4 mm tube and campanulate limb; lobes lan- ceolate. Anthers exerted from corolla, basally caudate. Style branches excurved, truncate, papillose. Achenes brown, cylindric, 3–4 mm, glabrous, ribbed. Pappus brown, ca. 8 mm. Fl. Sep.

- Riversides in valleys; ca. 2400 m. Yunnan (Lijiang).


**无毛蟹甲草** wú máo xiè jia cáo

Rhizomes procumbent, with fascicled fibrous roots. Stem solitary, erect, ca. 50 cm tall, 4–6 mm in diam. at base, angulate,
Subglabrous except on synflorescence branches, paniculate synflorescences branched above, upward subcurred. Basal leaves withered and fallen at anthesis. Lower stem leaf petioles 4–6.5 cm, not winged, hispidulous, rather expanded at base but without auricle; leaf blade triangular-hastate, 7.5–15 × 10–18 cm, base broadly cordate or subcordate, shortly decurrent, margin with fine or stout teeth, teeth triangular and mucronulate, apex long acute or acuminate; lateral lobes furcate, acute or 2-lobulate; basal lobes longer, narrowly triangular. Upper stem leaves similar, gradually smaller. Uppermost leaves shortly petiolate, sometimes ovate or narrowly ovate, basally 3-veined, palmately divaricate, connected before margins, lateral and reticulate veins slightly prominent on both surfaces, base rounded. Capitula numerous, terminal and in upper leaf axils, pyramidalpaniculate; synflorescence branches spreading, sparsely or densely yellow pubescent; peduncles 1.5–2 mm, hispidulous, basally with linear-lanceolate bractlets; bractlets 3–7 mm, rarely to 15 mm or shorter than 3 mm. Involucre cylindric, 9–11 × 2–3 mm; phyllaries 5, linear-lanceolate, 1.5–2 mm wide, outside pubescent, margin narrowly scarious, apically acute. Anthers exserted from corolla, basally caudate. Style branches excurved, truncate, papilllose. Achenes cylindrical, ca. 4 mm, glabrous, ribbed. Pappus white, equaling corolla lobes. Fl. Jul, fr. Sep.

- Forests, thickets on slopes, meadows, riversides; 800–2300 m. Chongqing (Nanchuan), Fujian, Guangxi, Guizhou, Hubei, Hunan, Jiangxi.

This species was originally described as *Cacalia subglabra* C. C. Chang (Parasenecio subglaber (C. C. Chang) Y. L. Chen), but Y. S. Chen (loc. cit.) demonstrated that the holotype of *C. subglabra*, Z. S. Chang 83429 (IBSC), as designated in the protologue, presumably in error, is in fact a specimen of the species currently known as *Ligularia stenocephala*, into the synonymy of which the names *C. subglabra* and *P. subglaber* must therefore be placed. Y. S. Chen published the new name *P. albus* for the species originally described as *C. subglabra*, designating as the holotype Z. S. Chang 83438 (IBSC), which was annotated as “*Cacalia subglabra* Chang” by C. C. Chang and, as it agrees perfectly with the description and illustration in his protologue, was evidently his intended holotype.


川鄂蟹甲草 chuan e xie jia cao

_Senecio vespertilio_ Franchet, J. Bot. (Morot) 8: 359. 1894; _Cacalia vespertilio_ (Franchet) Handel-Mazzetti.

Plants 90–120 cm tall. Stem erect, robust, distinctly sulcate, simple, glabrous in lower part, sparsely hispidulous and brown glandular hairy. Leaves few, long petiolate; petiole 15–20 cm, stout, not winged, shortly hairy and brown glandular hairy above; blade abaxially pale green, adaxially dark green, pentagonal-reniform, 20–22 × ca. 30 cm, abaxially hispidulous on veins, adaxially sparsely hispidulous, basally 7–9-veined, lateral veins upward furcate and laxly reticulate, base broadly deeply cordate, margin undulate-toothed, teeth mucronulate, apex shortly acute or rounded. Upper leaf petioles short, ca. 10 cm; leaf blades cordate or pentagonal-cordate, smaller, margin undulate-dentate, teeth mucronulate, apex homlike acuminate. Capitula numerous, terminal, arranged in panicle ca. 50 × 20 cm, spreading at anthesis; peduncles 2.5–3.5 cm, slender, with 2 or 3 linear bractlets, sparsely puberulent and brown glandular hairy. Involucres cylindric or narrowly campanulate, 1.3–1.5 cm × 5–7 mm; phyllaries 8(or 9), ovaceous, oblong-lanceolate, outside sparsely puberulent and glandular hairy, margin narrowly scarious, apically acuminate or acute. Florets 16–19; corolla yellow, 8–10 mm, with 3–3.5 mm tube and broadly tubular limb; lobes ovate-lanceolate, apically puberulent. Anthers exserted from corolla, basally long caudate. Style branches excurved, truncate, penicillate-papilllose. Achenes cylindric, 5–6 mm, glabrous, ribbed. Pappus white, ca. 9 mm. Fl. Jul–Aug, fr. Sep.

- Forest margins, canal sides, shaded places on mountains; 1200–2400 m. Chongqing (Chengkou), W Hubei (Shennongjia).


兔儿风花系 tu er feng hua xi

Leaves polygonal or reniform, 5–7-lobed or coarsely toothed. Capitula many, small, sessile or with very short peduncles. Involucres cylindric; phyllaries 2–5. Florets 3–5. Pappus white or yellowish brown.

- Three species: China.


两似蟹甲草 liang xi xie jia cao

Rhizomes robust, with numerous fibrous roots. Stem solitary, erect, striate, 80–150 cm tall, sparsely hairy or glabrous below, adpressed shortly pubescent in upper part. Leaves long petiolate; petiole not winged, 10–18 cm, glabrous; blade abaxially pale green, adaxially green, polygonal or reniform-triangular, abaxially sparsely shortly hairy, glabrescent, adaxially glabrous, 5–7-veined, lateral veins divarically branched, base cordate or truncate, margin undulate-toothed, apex acute. Upper leaves smaller, shortly petiolate. Uppermost leaves narrowly ovate, bractlike, entire or laxly denticulate. Capitula small, very many, terminal and in upper leaf axils, arranged in ca. 10 cm, branched, broad panicles, sessile or subsessile, often with 1 subulate bractlet; rachis puberulent or subglabrous below. Involucres cylindric, ca. 5 × 1 mm; phyllaries 3 or 5, rarely 4, distinctly striate, linear, subleathery, glabrous, barbate, margin scarious, apically obtuse. Florets 3 or 5, rarely 4; corolla white, 4–5 mm with slender tube and broadly tubular limb; lobes lan-

- Forest understories, forest margins, thickets, grasslands on slopes; 1200–2400 m. Hebei, Henan, Shaanxi, Shansi.

1a. Leaves papery; phyllaries and florets 3, rarely 4

1b. Leaves thickly papery, petioles stout; phyllaries and florets 5, rarely 4

18a. Parasenecio ambiguus var. ambiguus

18b. Parasenecio ambiguus var. wangkanus


Rhizomes robust, with numerous fibrous roots. Stem solitary, erect, 60–100 cm tall, striate, glabrous below, yellow-brown puberulent in upper part and on branches of synflorescences. Lower leaves fallen by anthesis. Median leaves 5–8, long petiolate; petiole 5–10 cm, not winged; blade cordate-reniform or orbicular-reniform, 8–12–(20) × 8–12–(20) cm, abaxially shortly pubescent on veins, adaxially laxy adpressed shortly hairy or subglabrous, veins abaxially prominent, basally 5-veined, lateral upward furcately branched, base broadly cor- date or subtruncate, margin often trian gularly 5–7-lobed, irregularly serrate, apex acute. Upper leaves homomorphic to lower leaves but smaller, broadly ovate, 3–5-lobed, shortly petiolate. Capitula small, numerous, terminal or in upper leaf axils, racemose or compound racemose; synflorescence branches spreading; peduncles short or very short. Involucres cylindric, 6–8 × 1.5–2 mm; phyllaries 5, linear or linear-lanceolate, outside glabrous, margin scarious, apically obtuse or rounded, purulent. Florets 5; corolla white, ca. 8 mm, with slender tube, and broadly tubular limb; lobes triangular-lanceolate. Anthers exserted from corolla, basally long cadate. Style branches excurved, apically truncate, papillose. Achenes cylindric, 3–4 mm, glabrous, ribbed. Pappus white or sordid white, 5–6 mm. Fl. Jul–Aug, fr. Sep–Oct.

- Forest margins, forest understories, thickets, grasslands on slopes; 1000–2000 m. Guizhou, W Hubei, Hunan, Sichuan.

Parasenecio ainsliaeiflorus differs from P. ambiguus by its peduncles, phyllaries, and florets 5 and its pappus white.


- Forest under stories on slopes; ca. 1400 m. Gansu (Kangxian).

矢兰花 xie jia cao

*Senecio rubescens* S. Moore, J. Bot. 13: 228. 1875; *Calicula rubescens* (S. Moore) Matsuda.

Plants 50–80–(100) cm tall. Stems erect, green or sometimes purple tinged, distinctly striate, glabrous, simple. Basal leaves fall at anthesis. Lower and median leaves long petiolate; petiole not winged, 3–4.5 cm, glabrous; blade abaxially pale green, adaxially green, broadly triangular, 10–18 × 5–16 cm, 3–5-lobed; lobes triangular, basal lobes sometimes rudimentary, both surfaces glabrous or puberulent on veins, base cuneate or truncate, margin stiffly mucronulate-denticulate. Pappus white or reddish brown, ca. 7 mm. Fl. Jul–Aug, fr. Sep.

- Forest understories, forest margins, thickets in valleys; 800–1400 m. Anhui, Fujian, Hunan, Jiangxi.


天目兰花甲草 tian mu shan xie jia cao


Stems robust, erect, distinctly striate, green or purple above, to 120 cm tall, ca. 1.2 cm in diam. at base, branched above; branches ascending or spreading, often divaricate. Leaves long petiolate; petiole ca. 10 cm, not winged, glabrous; lower leaves fall at anthesis; median stem leaves large; blade abaxially green, adaxially green, broadly pentagonal or hastate, 15–20(–30) × 8–25 cm; terminal lobes large, apically acute; lateral lobes narrowly triangular, small, obscurely angled, both surfaces glabrous, basally 3-veined, veins upward furcately branched, base broadly cuneate or truncate, margin mucronulate-denticulate. Capitula many, 2–2.5 cm when dry, terminal or in upper leaf axils, arranged in broad panicles; peduncles 2.5–5 cm, stout, apex often dilated; bractlets 1 or 2, linear or linear-lanceolate, glabrous. Involucres campanulate, 1.3–1.5 × 1.7–2 cm, not calyculate at base; phyllaries 12, oblong or oblong-lanceolate, subequal, sometimes ± connate, outside puberulent, margin scarious, apically obtuse. Florets ca. 38; corolla yellow, with slender, ca. 3 mm tube and limb; lobes lanceolate, ca. 2 mm. Anthers exserted from corolla, basally sagitate. Style branches excurred, obtuse, slightly dilated, papillose. Achenes yellow-brown, cylindrical, ca. 6 mm, glabrous, ribbed. Pappus white or reddish brown, ca. 7 mm. Fl. Jul–Aug, fr. Sep.

- Roadsides, by canals on slopes; ca. 1000 m. Anhui, Zhejiang (Tianmu Shan).


About 25 species: China, Himalayan region, Japan; 24 species (23 endemic) in China.


阔柄 jihadiao
dan hua xie jia cao


Plants 50–80(–100) cm tall. Stems erect, green or sometimes purple tinged, distinctly striate, glabrous, simple. Basal leaves fall at anthesis. Lower and median leaves long petiolate; petiole not winged, 3–4.5 cm, glabrous; blade abaxially pale green, adaxially green, broadly triangular, 10–18 × 5–16 cm, 3–5-lobed; lobes triangular, basal lobes sometimes rudimentary, both surfaces glabrous or puberulent on veins, base cuneate or truncate, margin stiffly mucronulate-denticulate, apex acute. Upper leaves shortly petiolate, gradually smaller upward. Uppermost leaf blades ovate-lanceolate, 5–10 × 3–6 cm, apex acuminate. Capitula numerous, terminal or in upper leaf axils in furcate broad panicle; peduncles ascending, 5–15 mm, stout, sparsely pubescent or subglabrous, with 1 or 2 linear bractlets. Involucres narrowly campanulate, 10–12 × 5–10 mm; phyllaries 7 or 8(–10), oblong or oblong-lanceolate, outside glabrous, margin scarious, apically obtuse or rather acute. Florets 8–10; corolla yellow, 7–8 mm, with ca. 3 mm tubular tube and limb; lobes lanceolate. Anthers exserted from corolla, basally caudate. Style branches excurred, obtuse or truncate, papillose. Achenes yellowish brown, cylindrical, ca. 6 mm, glabrous, ribbed. Pappus white or reddish brown, ca. 7 mm. Fl. Jul–Aug, fr. Sep.

- Forest understories, forest margins, thickets in valleys; 800–1400 m. Anhui, Fujian, Hunan, Jiangxi.

wing, margin irregularly serrate, teeth mucronulate, apex acute or acuminate. Upper leaves shortly petiolate, gradually smaller upward, triangular or triangular-lanceolate. Uppermost leaves lanceolate or linear-lanceolate, margin subentire or finely 1- or 2-toothed. Capitula numerous, terminal or upper leaf axils in racemes or compound racemes, lateral, at first spreading, pendulous at anthesis; peduncles 2–3 mm, with 1–3 linear bractlets, arachnoid or subglabrous. Involucres cylindrical, 6–8(–10) mm; phyllaries 3, oblong-lanceolate, outside glabrous, margin ciliate, narrowly scarious, apically obtuse or slightly acute. Florets 5 or 6; corolla yellow, 6–7 mm, with ca. 3 mm tube and campanulate limb; lobes ovate-lanceolate. Anthers exserted from corolla, basally long caudate. Style branches excurred, truncate, papillose. Achenes yellow-brown, cylindrical, ca. 6 mm, glabrous, ribbed. Pappus white, ca. 6 mm. Fl. Jul–Aug, fr. Sep.

- Forest understories of *Abies* forests, forest margins, thickets; 3200–4100 m. SW and W Sichuan, NW Yunnan.

丽江蟹甲草 lijiang xie jia cao


Rhizomes shortly robust, 1.5–2 cm in diam., with many fibrous roots. Stem solitary, erect, usually red-purple below, distinctly striate, (30–)45–65 cm tall, often long naked except for few brown ovate scales, sparingly arachnoid at middle part. Leaves usually at middle to upper part; petiole as long as or shorter than blade, slender or expanded to 4–15 mm in diam. rounded auricle; blade adaxially green, thin, triangular or hastate-triangular, (5–)6–10 × 5–11 cm, abaxially densely white arachnoid-tomentose except on veins, adaxially densely hirsute, veins furcate at base, lateral veins connected reticulately, abaxially prominent, base truncate or subcordate, cuneate-decurrent into narrow or broad petiole, subamphicaulis, margin equally deeply undulate-toothed, teeth mucronate, apex acute or acuminate, mucronulate. Upper leaves smaller, lanceolate or linear-lanceolate, shortly petiolate. Capitula 12–18, terminal or in upper leaf axils, arranged in racemes or compound racemes; bracts linear-lanceolate, ca. 1 cm; peduncules 2–5(–10) mm, pendulous, white arachnoid. Involucres cylindric or narrowly campanulate, 8–10 × 2–5 mm; phyllaries 6–8, linear-lanceolate, ca. 10 × 1.5–2 mm, glabrous, few veined, margin narrowly scarious, apically obtuse, barbate; bractlets ca. 1/3 as long as phyllaries. Florets 9–12(–14); corolla yellow, or rarely orange-yellow, apically obtuse, barbate; bractlets ca. 1 cm; peduncles 2–5(–10) mm, pen- dulous, white arachnoid-tomentose except on veins, adaxially densely hispidulous, veins furcate at base, lateral veins connected reticulately, abaxially prominent, base truncate or subcordate, cuneate-decurrent into narrow or broad petiole, subamphicaulis, margin equally deeply undulate-toothed, teeth mucronate, apex acute or acuminate, mucronulate. Upper leaves smaller, lanceolate or linear-lanceolate, shortly petiolate. Capitula 12–18, terminal or in upper leaf axils, arranged in racemes or compound racemes; bracts linear-lanceolate, ca. 1 cm; peduncules 2–5(–10) mm, pendulous, white arachnoid. Involucres cylindric or narrowly campanulate, 8–10 × 2–5 mm; phyllaries 6–8, linear-lanceolate, ca. 10 × 1.5–2 mm, glabrous, few veined, margin narrowly scarious, apically obtuse, barbate; bractlets ca. 1/3 as long as phyllaries. Florets 9–12(–14); corolla yellow, or rarely orange-yellow, apically obtuse, barbate; bractlets ca. 1 cm; peduncles 2–5(–10) mm, pen- dulous, white arachnoid-tomentose except on veins, adaxially densely hispidulous, veins furcate at base, lateral veins connected reticulately, abaxially prominent, base truncate or subcordate, cuneate-decurrent into narrow or broad petiole, subamphicaulis, margin equally deeply undulate-toothed, teeth mucronate, apex acute or acuminate, mucronulate. Upper leaves smaller, lanceolate or linear-lanceolate, shortly petiolate. Capitula 12–18, terminal or in upper leaf axils, arranged in racemes or compound racemes; peduncles spreading or pendulous by anthesis, short, (3–)5–7 mm, slender, arachnoid, with 1 or 2 linear or linear-lanceolate brackets. Involucres cylindric, 8–10 × 2–2.5 mm; phyllaries 5, linear-lanceolate, 1.3–2 mm wide, sparsely puberulent or subglabrous, margin narrowly scarious, apically obtuse, ciliate. Florets (6–)8 or 9; corolla yellow, 7–8 mm, with 2.5–3 mm tube and broadly tubular limb; lobes linear-lanceolate, 1.5–2 mm. Anthers exserted from corolla, basally long caudate. Style branches truncate, papillose. Achenes yellow-brown, cylindric, 4–4.5 mm, glabrous, ribbed. Pappus white, 6–7 mm. Fl. Jul–Aug, fr. Sep.

- Open slopes, understories of Abies forests; 3000–3400 m. Yunnan (Dali, Zhongdian).

Parasenecio taliensis is similar to P. lidjiangensis but differs in having leaves 3 or 4, crowded at the middle; blade orbiculate or broadly ovate, abaxially densely white arachnoid-tomentose; and petiole not winged, not expanded at the base.


九龙蟹甲草 jiulong xie jia cao

Rhizomes procumbent or ascending, slender, with many fibrous roots. Stem solitary, erect, striate, scapiform, 30–35 cm tall, slender. Leaves 3 or 4, crowded near base, long petiolar, persistent at anthesis; petiole not winged, (3–)4–6 cm, glabrous, base slightly expanded, subamphicaulis; blade abaxially becoming purple-red when dry, adaxially green, broadly ovate-cordate or cordate, papery, abaxially laxly hirsute, subglabrous, ciliate, adaxially glabrous, basally 3–5-veined, lateral veins upward furcately branched, base cordate or subtruncate, margin undulate-toothed, teeth mucronulate, apex obtuse or slightly acute, mucronulate. Capitula 8–10, in upper part of stem, arranged in spicate racemes; peduncles 2–4–(–5) mm, with 1 or 2 linear or linear-lanceolate brackets, excurved or pendulous, sparsely arachnoid or ± glabrescent. Capitula inserted on one side. Involucres cylindric, ca. 10 × 2–3 mm; phyllaries 5, linear or linear-lanceolate, 10 × 0.5–1 mm, outside glabrous, margin narrowly scarious, apically acute or obtuse. Florets 5; corolla yellow, 5–6 mm, with slender 1.5–2 mm tube and narrowly campanulate limb; lobes lanceolate, ca. 2 mm, apically obtuse. Anthers exserted from corolla, basally long caudate. Style branches excurved, truncate, papillose. Achenes yellow-brown, cylindric, ca. 3 mm, glabrous, ribbed. Pappus white, 5–6 mm. Fl. and fr. Sep–Oct.

- Understories of Pinus or Picea forests on slopes; 3400–3500 m. Yunnan (Lijiang).


大理蟹甲草 da li xie jia cao

Senecio taliensis Franchet, J. Bot. (Morot) 8: 357. 1894; Cacalia taliensis (Franchet) Handel-Mazzetti.

Rhizomes subglobose, short, with many tomentose, fibrous roots. Stem solitary, erect, striate, 25–40 cm tall, slender, simple or sometimes laxly branched above, sparsely arachnoid or subglabrous, often naked in lower part. Leaves lax at middle to upper part, long petiolate; petiole not winged, 3–5(–8) cm, sparsely arachnoid or later glabrescent, not expanded at base; blade adaxially dark green, broadly ovate or ovate-oblrate, 3–5 × 3.5–6(–7) cm, membranous or submembranous, abaxially densely white or gray-white tomentose, adaxially densely or sparsely hirsute, veins abaxially prominent, basally 5-veined, lateral veins upward branched, base truncate or subcordate, margin inconspicuously undulate or irregularly triangular coarsely toothed, rarely subentire, teeth mucronulate, apex acute or obtuse. Upper leaves smaller, ovate or ovate-triangular, shortly petiolate. Capitula 5–7, terminal or in upper leaf axils, arranged in racemes or compound racemes; peduncles spreading or pendulous by anthesis, short, (3–)5–7 mm, slender, arachnoid, with 1 or 2 linear or linear-lanceolate brackets. Involucres cylindric, 8–10 × 2–2.5 mm; phyllaries 5, linear-lanceolate, 1.3–2 mm wide, sparsely puberulent or subglabrous, margin narrowly scarious, apically obtuse, ciliate. Florets (6–)8 or 9; corolla yellow, 7–8 mm, with 2.5–3 mm tube and broadly tubular limb; lobes linear-lanceolate, 1.5–2 mm. Anthers exserted from corolla, basally long caudate. Style branches truncate, papillose. Achenes yellow-brown, cylindric, 4–4.5 mm, glabrous, ribbed. Pappus white, 6–7 mm. Fl. Jul–Aug, fr. Sep.

- Understories of Picea forests; ca. 2700 m. Sichuan (Jiulong).


盐丰蟹甲草 yan feng xie jia cao


Plants with fascicled tomentose roots. Stem solitary, striate, erect, 55–65 cm tall, glabrous, long naked, with few scales. Leaves often crowded at middle of stems. Lower leaf petiole as long as blade or shorter, slender, not winged; blade broadly ovate-triangular or reniform-triangular, ca. 9 × 12–15 cm, with prominent angles on nearly basal margins, base truncate or slightly cordate, broadly cuneate-attenuate into petiole, apex
acut or shortly acute. Upper leaves shortly petiolate, gradually smaller upward, abaxially pale or becoming red-brown when dry, adaxially dark green, triangular or subpentagonal, narrow, papery when dry, basally 3-veined, rarely 5-veined, lateral veins extended-branched, both surfaces glabrous, veins prominent abaxially, margin cartilaginous mucronulate-denticulate, apex shortly acuminate. Capitula many, terminal or in upper leaf axils, arranged in lax racemes, pendulous; bracts linear-lanceolate, ca. 5 mm, submembranous; peduncles 3–5 mm, with 1 or 2 linear bractlets. Involucres cylindric, ca. 10 × 1.5–2 mm; phyllaries 3, linear-lanceolate, ca. 10 × 1.5 mm, glabrous, with many fine veins, margin narrowly scarious, apically acute or obtuse. Florets 2 or 3; corolla yellow, 8–10 mm, with ca. 4 mm tube and narrowly campanulate limb; lobes excised from corolla, basally long caudate. Style branches excised, apically obtuse or slightly acute, apic. Achenes cylindric, 3–4 mm, glabrous, ribbed. Pappus white, 7 or 8 mm. Fl. Aug–Sep.

- Understories of mixed forests; 2700–3200 m. Yunnan.


瓜拉坡蟹甲草 gua la po xie jia cao

*Senecio koulapensis* Franchet, J. Bot. (Morot) 8: 356. 1894; *Cacalia koulapensis* (Franchet) Handel-Mazzetti; *S. leclerei* H. Lévêillé.

Rhizomes short, stout, with tomentose fibrous roots. Stem solitary, erect, strigate, 30–80 cm tall, simple, brown multicellular villous in lower part. Median and lower stem leaves 3 or 4; petiole not winged, 3–5 cm, densely brown villous; blade abaxially pale green, sometimes turning purple, adaxially green, broad ovate-triangular or broadly ovate, rarely rhombic or cordate, 5–15–18 × 6–15 cm, papery, abaxially yellow-brown villous especially on veins, adaxially adpressed hispidulous, base truncate or subrounded, rarely cordate, margin usually triangularly toothed, teeth mucronulate, sometimes inconspicuous, apex obtuse or shortly acute. Upper leaves shortly petiolate or subsessile, gradually smaller or very small, bracteal-leaflike, lanceolate or linear-lanceolate, entire. Capitula numerous, terminal or in upper leaf axils, arranged in simple or rarely branched narrow panicles; peduncles ca. 2 mm, on one side, spreading, pendulous later, with 1 or 2 linear bractlets. Involucres cylindric, 6–8 × 1.5–2 mm; phyllaries 5, linear-oblong, 1–1.5 mm wide, glabrous, margin narrowly scarious, apically obtuse or slightly acute. Florets 5; corolla yellow, ca. 8 mm, with slender, ca. 3 mm tube and tubular limb; lobes lanceolate. Anthers exserted from corolla, basally caudate. Style branches excised, truncate, papillose. Achenes cylindric, 4–5 mm, glabrous, ribbed. Pappus white, 6–7 mm. Fl. Aug–Sep., fr. Oct.

- Understories of mixed forests on slopes; 2800–3200 m. Yunnan.


Prenanthes quinqueloba Wallr. ex Candolle, Prodr. 7: 195. 1838; *Cacalia pentaloba* Handel-Mazzetti; *C. quinqueloba* (Wallich ex Candolle) Kitamura; *Koyamacalia quinqueloba* (Wallich ex Candolle) H. Robinson & Brettell; *Senecio quinquelobus* (Wallich ex Candolle) J. D. Hooker & Thomson ex C. B. Clarke (1876), not (Thunberg) Candolle (1838).

Leaf blade margin lobed in distal 1/3; capitula arranged in narrow panicles ................................. 29a. var. quinquelobus

1b. Leaf blade margin 3-lobed in distal 3/4, lobes 2- or 3-lobed in distal 1/3; capitula arranged in broad panicles .... 29b. var. simuates

29a. Parasenecio quinquelobus var. quinquelobus

瓜拉坡蟹甲草(原变种) wu la po xie jia cao (yuàn biàn zhòng)

*Prenanthes quinqueloba* Wallrich ex Candolle, Prodr. 7: 195. 1838; *Cacalia pentaloba* Handel-Mazzetti; *C. quinqueloba* (Wallich ex Candolle) Kitamura; *Koyamacalia quinqueloba* (Wallich ex Candolle) H. Robinson & Brettell; *Senecio quinquelobus* (Wallich ex Candolle) J. D. Hooker & Thomson ex C. B. Clarke (1876), not (Thunberg) Candolle (1838).

Leaf blade margin lobed in distal 1/3. Capitula arranged in narrow panicles.

- Understories of *Quercus* or *Abies* forests, alpine meadows; 2800–4100 m. SW Sichuan, Xizang, NW Yunnan [Bhutan, N India, Myanmar, Nepal].


瓜拉坡蟹甲草 shen lie wu la xie jia cao


Leaf blade margin 3-lobed in distal 3/4, lobes 2- or 3-lobed in distal 1/3. Capitula arranged in broad panicles.

- Understories of *Abies* forests; 3000–3600 m. Xizang [Bhutan].

叶龙蟹甲草 yu long xie jia cao


Rhizomes procumbent, with numerous fibrous roots. Stem solitary, erect or slightly curved below, often purple, striate, 35–50 cm tall, shortly pubescent or arachnoid in upper part. Leaves usually 5, crowded at middle of stem, paniculate synflorescence branched above. Petiole narrowly winged, 1.5–2 cm; leaf blade adaxially green, broadly triangular, 6–9 × 4–6 cm, base truncate or cuneate, middle 3-lobed, central lobe shallowly 3-lobed, lateral lobes shallowly 2-lobed; lobes to 2.5 cm wide, abaxially densely gray-white arachnoid-lanate, adaxially sparsely or densely furfuraceous-hispidulous, palmately veined, margin deeply undulate-toothed, teeth mucronulate, apex acuminate. Uppermost leaves narrowly lanceolate, 3-fid upward into bracts; bracts purple tinged, linear, 1–1.2 cm, acute or acuminate. Capitula mostly at apex of stem, arranged in lax racemes; peduncles 2–3 mm, densely arachnoid, pendulous. Involucres cylindrical, 8–11 × 2–3 mm; phyllaries 4 or 5, pale green, linear or linear-lanceolate, 1.5–2 mm wide, margin ciliate, narrowly scarious, ± purple, obtuse or slightly acute. Florets 4 or 5; corolla yellow, 1–1.1 cm; tube ca. 1/2 as long as limb, slender; limb cylindrical-campanulate; lobes lanceolate. Anthers exserted from corolla, basally caudate. Style branches truncate. Achenes cylindrical, ca. 3 mm, glabrous, ribbed. Pappus white, shorter than corolla. Fl. Aug, fr. Oct.

- Forest margins on slopes; ca. 2400 m. Yunnan (Lijiang, Weixi).


川西蟹甲草 chuan xi xie jia cao


Rhizomes 1.3–1.4 cm in diam., with numerous tomentose fibrous roots. Stem solitary, erect or often slightly curved, striate, (20–)30–60 cm tall, long naked in lower part, glabrous. Leaves usually at middle and lower part of stem; petiole expanded at base, with incised or divided auricle, subamplexicaul; blade reniform-triangular or broadly ovate, 5–6 × 4–5 cm, 3–5-lobed; lobes spreading, lobulate or irregularly toothed, abaxially white arachnoid-tomentose, adaxially densely brown hispidulous, 3-veined, veins abaxially prominent, base truncate or slightly cordate, decurrent into broadly winged petiole, apex acute or slightly acute. Upper leaves smaller, ovate or ovate-lanceolate, incised or lobulate at base. Capitula numerous, terminal or in upper leaf axils, arranged in lax racemose panicles, spreading, pendulous later; peduncles 2–5 mm, densely shortly pubescent, with 1–3 linear bractlets. Involucres cylindrical or narrowly campanulate, ca. 7 × 3–4 mm; phyllaries 5, oblong-lanceolate, 1.5–2 mm, glabrous, margin narrowly scarious, apically obtuse or slightly acute, puberulent. Florets 8, rarely 10; corolla yellow, 6–7 mm, with slender, ca. 2 mm tube and narrowly campanulate limb; lobes lanceolate, ca. 1.5 mm. Anthers exserted from corolla, basally caudate. Style branches truncate, papillose. Achenes cylindric, ca. 3 mm, glabrous, ribbed. Pappus white, 5–6 mm. Fl. and fr. Aug–Sep.

- Understories of forests or thickets, grasslands, shaded and wet slopes; 3100–3700 m. SW and W Sichuan.


轮叶蟹甲草 lun ye xie jia cao


Rhizomes robust, ca. 1.5 cm in diam. Stem solitary, erect, 80–100 cm tall, long naked, or with few ovate scales in lower part, sparsely arachnoid above, subglabrous below, sulcate. Lower leaves fallen by anthesis; petiole expanded into ca. 2.5 cm wide, entire or laxly toothed auricle; blade adaxially green, obovate-spatulate, 5–10(–16) × 3–8(–10) cm, papery, lyrate-pinnate; lobes ovate-oblong or obovate, abaxially sparsely or densely arachnoid-tomentose, or ± glabrescent, adaxially sparsely apressed shortly hairy, base decurrent into broadly winged petiole, apex acute or slightly acute, unequally triangularly toothed, teeth mucronulate. Upper leaves smaller; uppermost leaves often rudimentary as linear or linear-lanceolate bracts. Capitula numerous, arranged in racemes, or sometimes 1- or 2-branched, lateral, pendulous; peduncles very short, 2–4 mm, with linear-lanceolate bractlets at base. Involucres cylindrical, 8–10 × 2–3 mm; phyllaries 5 or 6, lanceolate, 8–10 × ca. 1.5 mm, puberulent, margin scarious, apically obtuse. Florets 5 or 6(or 7); corolla yellow, ca. 8 mm, with slender tube and ca. 3 mm, narrowly campanulate limb; lobes lanceolate. Anthers exserted from corolla, basally caudate. Style branches excrated, truncate, papillose. Achenes yellow-brown, cylindrical, ca. 4 mm, ribbed. Pappus white, 6–7 mm. Fl. and fr. Aug–Sep.

- Understories of forests on slopes, forest margins, grasslands, roadsides; 2200–3600 m. W Sichuan.

Parasenecio cyclotus is similar to *P. souliei* but differs in having leaves lyrate-pinnate, petiole with entire or toothed auricle ca. 2.5 cm wide, and florets 5 or 6.


蛛毛蟹甲草 zhu mao xie jia cao

Rhizomes robust, procumbent, with many fibrous roots. Stem solitary, erect, striate, 60–100 cm tall, simple, usually white arachnoid or later glabrescent. Petiole not winged, 6–10 cm, sparsely arachnoid; leaf blade adaxially green, narrowly triangular, 8–13 × 8–10 cm, rachis sparsely shortly hairy or subglabrous, abaxially white or gray-white arachnoid, basally 5-veined, lateral veins furcately branched, prominent on both surfaces, margin irregularly serrate, teeth mucronulate, apex acute or acuminate. Upper leaves smaller, similar to median leaves or narrowly ovate or narrowly triangular, but with short petioles. Capitula numerous, usually terminal or in upper leaf axes, arranged in pyramidal lax panicles on one side, spreading pendulous; peduncles ca. 3 mm, same as rachis arachnoid, shortly pubescent. Involucres cylindrical, 8–13 × 1–1.5 mm; phyllaries 3(4), rarely 2, yellow-green, linear-oblong, glabrous, few finely veined, margin narrowly scarious, apically obtuse, puberulent. Florets usually 3 or 4, rarely 1 or 2; corolla white, 8–10 mm, with slender tube and ca. 3 mm broadly tubular limb; lobes lanceolate. Anthers exserted from corolla, basally caduate. Style branches excurved, truncate, papillate. Achenes cylindrical, 3–4 mm, glabrous, ribbed. Pappus white, 7–8 mm. Fl. Jul–Aug, fr. Sep–Oct.

- Understories of forests on slopes, forest margins, thickets, grasslands; 1700–3400 m. Gansu, Qinghai, Shaanxi, Sichuan, E Yunnan.


辛家山蟹甲草  xin jia shan xie jia cao


Rhizomes slender, with many fibrous roots. Stem solitary, erect, striate, 40–75 cm tall, arachnoid or gradually glabrescent. Leaves usually crowded at middle part; petiole 6.5–8 cm, broadly or narrowly winged; blade thinly papery; median leaves broadly cordate, 8–10 × 10–12.5 cm, abaxially sparsely arachnoid on veins, later ± glabrescent, adaxially sparsely pubescent, base 3-veined, lateral veins furcate, veins prominent on both surfaces, base cordate, margin irregularly sharply serrate, teeth mucronulate, apex shortly acute or caduate-acuminate. Upper leaves smaller; petiole 3.5–5 cm, narrowly winged, not expanded at base. Capitula numerous, usually arranged in terminal racemes or branched in lower part, to 17 cm; peduncles 3–7 mm, slender, arachnoid and densely shortly glandular hairy, with 2 linear or linear-lanceolate involucres. Involucres cylindrical or narrowly campanulate, 9–11 × ca. 1.5 mm; phyllaries 3, linear-lanceolate, arachnoid or subglabrous, margin scarious, apically obtuse. Florets 3; corolla yellow, 6–7 mm; limb broadly tubular; lobes lanceolate. Anthers exserted from corolla, ca. 4 mm, basally caduate. Style branches excurved, truncate, papillate. Achenes brown, cylindrical, 3–4 mm, glabrous, ribbed. Pappus white, 6–7 mm. Fl. Jun–Jul, fr. Aug.

- Understories of dense forests on slopes; 2300–2600 m. Shaanxi.


玉山蟹甲草  yu shan xie jia cao

Stem solitary, erect or curved, 47–70 cm tall, paniculate-branched above, glabrous below, upper part and branches crisped-pubescent. Leaves papery, sparsely distributed. Lower leaves long petiolate; petiole ca. 12 cm, not winged; blade abaxially pale green, adaxially green, subtrigangular-reniform, ca. 13 × 19 cm, abaxially densely lanate, adaxially crisped-pubescent, base cordate, marginal teeth mucronulate, apex acute. Upper leaves smaller, shortly petiolate. Capitula numerous, arranged in terminal panicles; peduncles 1–3.5 mm, slender, with 1 or 2 subulate bractlets. Involucres cylindrical, 8.5–11 mm, calyculate; phyllaries 2, narrowly oblong, 1.5–2 mm wide, glabrous, apex obtuse. Floret 1; corolla yellow, 8.5–10.5 mm; lobes lanceolate, ca. 1.5 mm. Achenes cylindrical, ca. 5 mm, glabrous. Pappus white, 6–7 mm. Fl. Aug.

- Mountain summits; ca. 3000 m. Taiwan (Jiayi, Yilan).


深山蟹甲草  shen shan xie jia cao

*Senecio profundorum* Dunn, J. Linn. Soc., Bot. 35: 507. 1903; *Cacalia profundorum* (Dunn) Handel-Mazzetti; *Koyamacalia profundorum* (Dunn) H. Robinson & Brettell.

Rhizomes procumbent, robust. Stem solitary, erect, 50–120 cm tall, often naked below, striate, sparsely arachnoid, later glabrescent, ferruginous-brown glandular, shortly pubescent. Leaves long petiolate; petiole 5–8 cm, basally subamplexicaul; blade broadly ovate or ovate-rhombic, membranous, abaxially sparsely arachnoid, later glabrescent, adaxially hispidulous, base truncate or slightly cordate, cuneately narrowed into winged petiole, apex acute or shortly acute, teeth densely mucronulate. Middle stem leaves 10–13 × 10–12 cm, basally 3-veined, lateral veins furcately branched, veins abaxially prominent. Upper leaves shortly petiolate, smaller. Capitula numerous, arranged in terminal leaf panicles; peduncles slender, sparsely glandular shortly pubescent, with 1–3 linear bractlets. Involucres cylindrical, 8–10 × ca. 3 mm; phyllaries 5, linear-lanceolate, 8–9 × 1.5–2 mm, glabrous or subglabrous, margin scarious, apex obtuse, puberulent. Florets 5; corolla yellow, ca. 8 mm, with slender ca. 3 mm tube, broadly tubular; limb lobes lanceolate, 1.5–2 mm. Anthers exserted from corolla, basally caduate. Style branches excurved, truncate, papillate. Achenes cylindrical, ca. 6 mm, glabrous, ribbed. Pappus white, shorter than corolla. Fl. and fr. Aug–Sep.

- Dense forests, forest margins on slopes, wet places in valleys, ravines, cliffs; 1000–2100 m. Chongqing, W Hubei, E Sichuan.


苞螃蟹甲草  bao lin xie jia cao

*Senecio phyllolepis* Franchet, J. Bot. (Morot) 8: 360. 1894; *Cacalia hupenhensis* Handel-Mazzetti; *C. phyllolepis* (Franchet) Handel-Mazzetti; *Koyamacalia hupenhensis* (Handel-Mazzetti) H. Robinson & Brettell; *K. phyllolepis* (Franchet) H. Robinson & Brettell.

Rhizomes robust, with fascicled fibrous roots. Stem solitary, erect, 60–90 cm tall, simple, striate or sulcate, arachnoid,
long naked below, often purple tinged. Leaves ca. 5, usually crowded at middle part, long petiolate; petiole 8–12 cm, obscurely narrowly winged or nearly not winged; blade abaxially pale green, adaxially dark green, broadly ovate, ovate-triangular, or ovate-cordate, 10–16 × 8–10 cm, thinly papery, abaxially sparsely arachnoid, later glabrescent, adaxially sparsely brown hispidulous, veins prominent on both surfaces, basally 3-veined, lateral veins furcately branched, base cordate or cuneate, rarely truncate, margin unequally serrate, teeth mucronulate, apex caudate-acuminate. Upper leaves smaller, ovate, shortly petiolate. Uppermost leaves bracteate, lanceolate or linear-lanceolate. Capitula numerous, terminal or in upper leaf axils, arranged in racemes or narrow racemose panicles; peduncles 6–10 mm, erect or pendulous, shortly hairy, with 2 or 3 unequal bractlets. Involucres cylindric or narrowly campanulate, 8–10 × 3–4 mm; phyllaries 5(or 6), green, oblong-lanceolate, 8–10 × 1.5–2 mm, herbaceous, sparsely shortly hairy or subglabrous, margin scarious, apically obtuse or slightly acute, puberulent. Florets 5 or 6; corolla yellow, 8–9 mm, with slender 3–4 mm tube and narrowly campanulate limb; lobes lanceolate. Anthers exerted from corolla, basally caudate. Style branches excurred or involute, truncate, papillose. Achenes yellow-brown, cylindric, 5–6 mm, glabrous, ribbed. Pappus white, 7–8 mm. Fl. and fr. Sep–Oct.

- Understories of forests on slopes, by canals; 1000–2500 m. Chongqing, W Hubei, E Sichuan.


紫背蟹甲草  zi bei xie jia cao

Senecio ianthophyllus Franchet, J. Bot. (Morot) 8: 361. 1894; Cacalia ianthophylla (Franchet) Handel-Mazzetti.

Rhizomes short, slender, with few tomentose fibrous roots. Stem solitary, erect, or oblique, 20–40 cm tall, slender, glabrous, striate, naked below. Stem leaves usually 2 or 3, crowded at middle part of stem; lower leaves fallen by anthesis, long petiolate; petiole not winged, 5–7 cm, sparsely arachnoid or glabrous; blade abaxially purple-blue or purple, adaxially green, thinly papery, broadly cordate-ovate-ribulcic, or ovate-cordate, 5–14 × 8–11 cm, abaxially sparsely arachnoid, later glabrescent, adaxially sparsely hispidulous, basally 5–7-veined, lateral veins upward furcately branched, veins prominent on both surfaces, base deeply cordate, margin unequally serrate, teeth mucronulate, apex acuminate or caudate. Capitula numerous, usually on one side, arranged in terminal large panicles, synflorescence branches spreading, glabrous or uppermost hispidulous; peduncles 2–4 mm, spreading or pendulous, densely shortly hairy. Involucres pink-purple, cylindric, 12–14 × 1.5–2 mm, glabrous, margin narrowly scarious, apically slightly acute. Florets 5 or 6; corolla yellow, ca. 8 mm; tube shorter than limb; lobes lanceolate. Anthers exerted from corolla, basally caudate. Style branches excurred, truncate, papillose. Achenes cylindric, glabrous. Pappus white, ca. 8 mm. Fl. Jul–Aug.

- Mixed or coniferous forests; 1400–1600 m. Chongqing (Chengkou), W Hubei.

Parasenecio ianthophyllus is easily distinguished by its stem leaves 2 or 3, often crowded at the middle, and blade broadly cordate-ribulcic, abaxially blue-purple, with veins conspicuously prominent on both surfaces.


白头蟹甲草  bai tou xie jia cao

Senecio leucocephalus Franchet, J. Bot. (Morot) 8: 360. 1894; Cacalia leucocephala (Franchet) Handel-Mazzetti.

Rhizomes procumbent, with numerous tomentose fibrous roots. Stem solitary, erect, often purple tinged, conspicuously striate, 40–80 cm tall, naked below, glabrous, white arachnoid or later glabrescent above. Leaves long petiolate; lower leaves fallen by anthesis; petioles 4–9 cm, not winged, glabrous or subglabrous. Median leaves adaxially green, ovate-triangular or hastate-triangular, rarely cordate, 8–12 × 18–14 cm, abaxially white or gray-white arachnoid, adaxially hispidulous, palmately 3–5-veined, lateral veins upward furcate, veins prominent on both surfaces, base cordate or truncate, margin irregularly serrate, teeth mucronulate, apex shortly acute or caudate. Upper leaves smaller, petioles shorter. Capitula many, terminal and in upper leaf axils, arranged in narrow panicles; peduncles 2–17 mm, with 2 or 3 linear bractlets, densely tomentose. Involucres cylindric or cylindric-campanulate, 8–10 × 4–5 mm; phyllaries 5, oblong or oblong-lanceolate, 8–10 × 2–4 mm, white lanate, margin scarious, apically obtuse. Florets 10–13; corolla yellow, 8–11 mm, with slender ca. 3 mm tube and tubular limb; lobes lanceolate. Anthers exerted from corolla, basally long caudate. Style branches excurred, truncate, papillose. Achenes cylindric, 5–6 mm, glabrous, ribbed. Pappus white, 6–8 mm. Fl. Aug–Sep, fr. Oct.

- Forest understories, forest margins, grasslands; 1200–3000 m. Chongqing (Chengkou, Wushan), W Hubei.

Parasenecio leucocephalus is easily distinguished by its stems and leaves abaxially densely arachnoid; phyllaries rather broad, densely white lanate; and florets 10–13.


长穗蟹甲草  chang sui xie jia cao


Rhizomes robust, with many fibrous roots. Stem solitary, erect, striate, to 100 cm tall, slender, stiff, strict, branched above, adpressed arachnoid and shortly glandular pubescent. Leaves long petiolate; petiole not winged, 3–5 cm. Median leaves papery, broadly cordate, 10–15 × 17–20 cm, abaxially gray-white tomentose, adaxially articulately shortly hairy, palmately 5-veined, lateral veins furcately branched, veins prominent on both surfaces, base cordate, margin deeply undulate-dentate, teeth sometimes long mucronulate, apex shortly acute or obtuse. Uppermost leaves shortly petiolate, reniform, sometimes with buds in leaf axils. Capitula numerous, terminal and in upper leaf axils, arranged in raceme-panicles, or lateral synflorescences rudimentary, spreading or pendulous; rachis arachnoid, tomentose; bracts linear-lanceolate; uppermost bracts to 1 cm; peduncles 1–3 mm, usually with 1 bractlet. Involucres cylindric, 8–10 × 1.5–2 mm; phyllaries 3 or 4, green, linear, 10–
11 × ca. 1.5 mm, glabrous or sparsely pubescent. Florets 2–4; corolla yellow, ca. 8 mm, with slender, 2–3 mm tube and cylindrical-campanulate limb; lobes lanceolate, ca. 1 mm. Anthers slightly exerted from corolla, ca. 5 mm, basally caudate. Style branches truncate, papillose. Achenes brown, cylindrical, ca. 5 mm, rugulose. Pappus white. Fl. Jul–Aug, fr. Sep–Oct.

- Thickets, grasslands on slopes; 2000–3100 m. Sichuan.


珠芽蟹甲草


Plants ca. 85 cm tall, with fascicled fibrous roots. Stem solitary, erect, often becoming purple, finely sulcate, naked at base, sparsely arachnoid. Leaves lax; petioles 3–5 cm, not winged; leaf blade adaxially green, broadly triangular-ovate or broadly ovate, 6–12 × ca. 15 cm, herbaceous, abaxially sparsely arachnoid, glabrescent, adaxially sparsely shorty brown hairy on veins, palmately 5–7-veined and 1 or 2 lateral veins, base angular-cordate, margin undulate, stoutly toothed, or 9–11-lobeulate, apex obtuse or shortly acute. Upper leaves shortly petiolate, all leaf axes with ovoid, ca. 7 mm scaly buds; buds brown, tomentulose. Capitula numerous, spreading, arranged in terminal racemes or compound racemes, to 40 cm; lower bracts with sparse buds; uppermost bracts to 8 mm; bracts lanceolate, ca. 6 mm, submembranous; peduncles 1–2 mm, tomentose, with 1 bractlet. Involucres cylindrical-campanulate; phyllaries 5 or 6, lanceolate, 11–13 mm, glabrous, margin scarious, apically obtuse. Florets 8–10; corolla yellow, ca. 1 cm, with ca. 4 mm tube and cylindrical, broader, ca. 6 mm limb; lobes linear, ca. 1 mm, involute. Anthers exerted from corolla, purple when dry, basally caudate. Style branches truncate, papillose, ovary glabrous, cylindrical. Pappus white, shorter than corolla. Fl. Sep.

- Wet places in valleys; 1000–2200 m. W Hubei, Hunan (Hengshan), Shaanxi (Hanzhong).


蜂斗菜


Rhizomes robust, with many fascicled fibrous roots. Stem solitary, erect, 100–150 cm tall, striate, sparsely arachnoid. Leaves long petiolate, papery; petiole 5–14 cm, not winged, shortly pubescent or subglabrous; median leaves adaxially green, broadly ovate-cordate, 9–16 × 12–20 cm, abaxially densely white arachnoid or later glabrescent, adaxially sparsely adpressed shortly hairy or subglabrous, palmately 5–7-veined, veins abaxially prominent, adaxially impressed, base deeply cordate, margin stoutly undulate-toothed, teeth mucronulate, apex acute or shortly acuminate. Upper leaves shortly petiolate, gradually smaller upward. Capitula numerous, usually arranged in crowded spicate racemes; peduncles ca. 9 mm, with 3 linear-lanceolate bractlets, arachnoid. Involucres cylindric, 1.2–1.4 cm; phyllaries 5, oblong-lanceolate, glabrous, margin scarious, apically rounded-obtuse. Florets 5–8; corolla yellow or white, ca. 8 mm, tube slender, ca. 3 mm, limb broadly tubular; lobes triangular. Anthers exerted from corolla, basally caudate. Style branches excurved, apically truncate, papillose. Achenes cylindrical, 5–7 mm, glabrous, ribbed. Pappus white, 7–9 mm. Fl. Aug–Sep, fr. Oct.

- Wet places of forest understories on slopes; 1700–2200 m. Guizhou, Sichuan.


黄山蟹甲草


Plants erect, 25–50 cm tall. Rhizomes robust, ca. 2.5 cm in diam., with many fascicled tomentose fibrous roots. Stem solitary, simple, striate or sulcate, sparsely arachnoid, gradually glabrescent, naked in lower part, with 2 withered ovate scales. Leaves usually 3 or 4, crowded at middle part; petiole often shorter than leaf blade, petioles in lower part to 9 cm, obscuringly narrowly winged, sparsely arachnoid or subglabrous, base expanded and subamplexicaul; leaf blade adaxially dark green, broadly reniform or ovate-orbicular, 6–12(–15) × 8–15 cm, membranous when dry, abaxially thinly white arachnoid, adaxially sparsely or on veins more densely brown strigillose, basally 3-veined, lateral veins furcate in 3–5 pairs, veins prominent on both surfaces, base cordate, shortly euneate, decurrent into petiole, margin deeply undulate or equalily finely toothed, teeth mucronulate, apex acute or rounded-obtuse. Upper leaves shortly petiolate, ovate-cordate, smaller, apex acute or slightly acute. Uppermost leaves bractlike, ovate or ovate-lanceolate. Capitula many, arranged in 8–18 cm lax panicles; rachis slender, arachnoid and brown shortly pubescent; peduncles 3–5 mm or subsessile, with 1 or 2 subulate bractlets. Involucres narrowly campanulate-cylindric, ca. 10 × 1.5–2 mm, margin broadly scarious, apically obtuse, puberulent. Florets 7 or 8; corolla yellow, ca. 8 mm; tube slender, ca. 3 mm; limb narrowly campanulate, 4–5 mm; lobes ovate-lanceolate, apex puberulent. Anthers exerted from corolla, basally shortly caudate. Style branches excurved, apically truncate, penicillate, papillose. Achenes brown, cylindric, 4–5 mm, glabrous, ribbed. Pappus white, ca. 7 mm. Fl. Jun–Aug, fr. Sep.

- Grasslands at mountain summits, shaded wet places on slopes; 1500–1800 m. Anhui, Jiangxi, Taiwan, Zhejiang.

Parasenecio hwangshanicus is quite similar to *P. rufipilis* in aspect, but the latter differs in having petioles and stems red-brown villous; capitula arranged in dense narrow panicles, rachis densely arachnoid; and florets 5.


红毛蟹甲草
**Senecio rufipilis** Franchet, J. Bot. (Morot) 8: 359. 1894; *Cacalia rufipilis* (Franchet) Y. Ling; *Koyamacalia rufipilis* (Franchet) H. Robinson & Brettell.

Plants erect, 60–80 cm tall. Rhizomes robust, with many tomentose fibrous roots. Stem solitary, striate, simple, red-brown hyaline villous in lower part, white arachnoid-villos in upper part. Leaves long petiolate; lower leaves withered by anthesis; petiole not winged, 5–10 cm, red-brown villous. Median leaf blades broadly ovate-cordate or reniform, 7.5–13 × 8–19 cm, with red-brown hyaline glandular hairs, palmately 5–7-veined, veins raised abaxially, impressed adaxially, base deeply cordate, margin trianqularly 5-lobulate or deeply serrate, apex acute. Upper leaves smaller, shortly petiolate. Capitula many, arranged in panicles at apex of stem; synflorescence branches crowded; rachis and peduncles white arachnoid; peduncles very short, with 1–3 triangular bractlets. Involucres cylindrical, 10–13 × ca. 3 mm; phyllaries 5 or 6, linear-lanceolate, shortly brown pubescent, margin scarious, apically rounded-obtuse. Florets 5; corolla yellow, ca. 1 cm; tube slender, ca. 3 mm; limb broadly tubular; lobes triangular. Anthers exserted from corolla, basally ciliate. Style branches excurved, apically truncate, papillose. Achenes cylindrical, ca. 5 mm, glabrous, ribbed. Pappus white, ca. 1 cm. Fl. Jul–Aug, fr. Sep.

- Grasslands, thickets, forests on slopes; 1100–1800 m. Gansu, Henan, Shaanxi, Sichuan.

*Parasenecio rufipilis* differs from *P. dasythyrsus* and *P. bulbiferoides* by its plants red-brown hyaline glandular pubescent; leaf axils without scaly buds; capitula more dense, larger; and peduncles and involucrels red-brown villous.


*山interval 茶*  shan xie jia cao


Plants 65–90 cm tall. Rhizomes procumbent, with fibrous roots. Stem solitary, straight or slightly curved, striate, long naked, articulate, glandular pubescent or subglabrous in lower part, arachnoid or shortly glandular hairy in upper part. Lower leaves often fallen by anthesis. Median leaves crowded, long petiolate; petiole 7–14 cm, not winged, glandular hairy; blade abaxially pale green, adaxially dark green, broadly ovate-cordate or cordate, 10–15 × 13–20 cm, thinly papery, palmately 7-veined, lateral veins furcately branched, abaxially sparsely arachnoid and glandular hairy, adaxially brown striglilose, base ciliate, rarely subtruncate, basll margin with deeply undulate stout teeth, teeth mucronulate, apex acute or slightly obtuse. Upper leaves shortly petiolate, very small. Capitula many, apically in dense or lax narrow panicles; peduncles 3–4 mm, with 1–3 linear bractlets at base; rachis and peduncles arachnoid and glandular hairy; capitula spreading, pendulous later, arachnoid and glandular hairy. Involucres narrow cymulate or cylindric; phyllaries 4 or 5, pale green and nitid, broadly linear-lanceolate, 10–12 × 1.5–2 mm, sparsely glandular hairy, margin narrowly scarious, apex slightly acute or obtuse. Florets 5 or 6; corolla orange, exserted from involucre; tube slender, as long as limb, or rather short; limb narrowly campanulate; lobes lanceolate, ca. 3 mm. Anthers exserted from corolla, basally long ciliolate. Style branches excurved, apically truncate, pennisilate, papillose. Achenes cylindrical, 2–3 mm (immature), glabrous. Pappus white, as long as corolla. Fl. and fr. Aug–Sep.

- Grasslands on slopes; 700–1200 m. Gansu, Shaanxi, Shanxi.

*Parasenecio dasythyrsus* is similar to *P. rufipilis* in aspect but differs by its articulate glandular hairs, orange florets, and longer peduncles.


*翠雀叶组* cui que ye zu


Stem leaves many; blade palmately medially to deeply 5–7-lobed, palmately veined. Phyllaries 3–5, rarely 7 or 8. Florets 3–5, rarely 10–14. Pappus white or red-brown.

Nine species: Bhutan, China, Japan; six species (four endemic) in China.

**北蟹甲草** cui que xie jia cao


Plants 80–150 cm tall; rhizomes not seen. Stem solitary, erect, striate, often becoming purple in lower part, shortly pubescent or subglabrous. Leaves petiolate; lower leaves withered by anthesis. Median leaves 3 or 4; petiole not winged, 4–6.5 cm, shortly yellow-brown hairy; blade broadly reniform or ovate-reniform, 9.5–16 × 11–18 cm, base truncate, patently lobed, apex long cuate-acute; lobes 5–7, narrowly obovate or oblong-ovate, sometimes secondarily pinnately lobed, abaxially yellow-brown pubescent, adaxially adpressed shortly hairy, veins raised abaxially, impressed adaxially, basally 5-veined, lateral veins upward branched, margin sparsely serrate, teeth mucronulate, apex cuate or acuminatus. Upper leaves shortly petiolate, small. Capitula many, terminal, arranged in narrow panicles; rachis and peduncle densely glandular shortly hairy; peduncles ca. 1 mm, with 1 or 2 linear or triangular bractlets. Involucres cylindric, 5–6 × 2–3 mm; phyllaries 5, linear-lanceolate, 1–1.5 mm, outside glabrous, apex slightly obtuse. Florets 5; corolla yellow, ca. 8 mm; tube slender, ca. 3 mm; limb broadly tubular. Anthers exserted from corolla, basally long cuate. Style branches excurved, slender, truncate, papillate. Achenes cylindric, 2–3 mm, glabrous, ribbed. Pappus yellow-brown, 5–6 mm. Fl. Jul–Aug, fr. Sep.

- Forests on slopes, shaded wet places, watersides in valleys; 1200–2500 m. Gansu, Qinghai, Shaanxi.


**中华蟹甲草** zhong hua xie jia cao


Plants erect, to 1 m tall. Rhizomes short, stout, with numerous fibrous roots. Stem solitary, striate, glabrous, naked in lower part, with withered scales or fibrous, with many leaves in lower 1/2. Leaves large; petiole 10–12 cm, narrowly winged; leaf blade abaxially pale, adaxially green, reniform or broadly ovate-triangular, 10–20 × 12–24 cm, thinly papery, usually pinnately deeply 5–7-lobed; lobes lanceolate or elliptic-lanceolate, abaxially glabrous, axially brown strigose on veins, basally 3–5-veined, lateral veins furcate near base, veins raised abaxially, impressed adaxially, base cordate or subcordate, margin stiffly ciliate and sparsely cartilaginous mucronulately or undulate finely toothed, apex acuminatus; central lobe larger, lateral lobes often 1-lobulate, lobule obliquely triangular. Upper leaves smaller, hastately 3-lobed. Uppermost leaves shortly petiolate, very small. Capitula many, terminal or in upper leaf axils, arranged in large, broad panicles to 15–20 cm; peduncles 8–15 mm, stout; rachis shortly brown hairy, base with 2 or 3 subulate bractlets. Involucres cylindric; phyllaries 7 or 8, linear-lanceolate or linear, 8–10 × ca. 1 mm, outside glabrous, apex acute, puberulent. Florets 6–14; corolla yellow or purple, ca. 8 mm; tube slender, ca. 3 mm; limb broadly tubular, lobes triangular-lanceolate, ca. 1.5 mm. Anthers exserted from corolla, basally shortly cuate. Style branches excurved, apiculate truncate, penicillate, papillate. Achenes brown, oblong-cylindric, 5–6 mm, glabrous, ribbed. Pappus red-brown, 7–8 mm. Fl. Jul–Aug, fr. Sep.

- Shaded wet places of forest understories on slopes, forest margins by canal sides; 1000–2000 m. Henan, Shaanxi.


**太白蟹甲草** tai bei xie jia cao

*Senecio pilgerianus* Diels, Bot. Jahrb. Syst. 36(Beibl. 82): 106. 1905; *Cacalia pilgeriana* (Diels) Y. Ling; *Koyamacalia pilgeriana* (Diels) H. Robinson & Brettell.

Plants erect, 60–100 cm tall. Rhizomes not dilated, with numerous fibrous roots. Stem solitary, striate, glabrous or sparsely arachnoid in lower part, shortly pubescent in upper part and synflorescence branches, long naked in lower part by anthesis. Lower leaves often withered by anthesis; leaves petiolate; petiole not winged, (8–)10–20 cm; blade abaxially pale green, adaxially green, reniform or broadly reniform, 15–22 × 20–30 cm, papery, patently medially to deeply lobed; lobes 5–7, obovate or oblong, pinnately lobed, abaxially shortly hairy on veins, adaxially adpressed shortly pubescent, basally 5-veined, lateral veins upward furcate, base cordate or truncate, margin undulate toothed, teeth mucronulate, apex acute. Upper leaves shortly petiolate, smaller. Uppermost leaves very small, bractlike. Capitula many, usually arranged in crowded branched panicles; rachis and peduncle densely brown shortly hairy, subsessile, with 1 linear-lanceolate bractlet at base. Involucres cylindric, 5–6 × ca. 1.5 mm; phyllaries 3, linear-lanceolate, ca. 1 mm wide, striate, margin narrowly scarious, apically obtuse, puberulent. Florets 3; corolla white or pale yellow, 6–7 mm; tube slender, ca. 3 mm; limb broadly tubular. Anthers exserted from corolla, basally long cuate. Style branches excurved, slender, truncate, papillate. Achenes cylindric, 2–3 mm, glabrous, ribbed. Pappus yellow-brown, 5–6 mm. Fl. Jul–Aug, fr. Sep.

- Forests on slopes, shaded wet places, watersides in valleys; 1200–2500 m. Gansu, Qinghai, Shaanxi.


**湖北蟹甲草** hu bei xie jia cao
Herbs, perennial, to 1 m tall. Rhizomes short, with numerous elongate fibrous roots. Stem solitary, erect, striate, glabrous. Leaves petiolate; petiole 2.5–9.5 cm, glabrous; blade green on both surfaces, orbicular-ovate, 16–27 × 15–35 cm, thinly papery, palmately and deeply (5)6–9-lobed; lobes lanceolate or elliptic-lanceolate, both surfaces glabrous, basally 3- or 4-veined, lateral veins furcate near base, veins raised abaxially, impressed adaxially, base subcordate, margin undulate. Finely toothed, apex acuminate. Capitula numerous, discoid, arranged in panicles ca. 20 cm; peduncles 4–6 mm, 3-lobed; lobe margin entire, apex acuminate. Involucres cylindric, 10–12 × ca. 3 mm; phyllaries 5, linear, 7–8 × ca. 1 mm, outer surface glabrous, margin membranous, apex acute. Flores cymosum, 5; corolla tube ca. 4 mm; limb broadly tubular, ca. 4 mm; lobes 5, lanceolate, ca. 1 mm. Anthers exerted from corolla, basally shortly ciliate. Style branches excurved, apically truncate, papillose. Achenes brown, cylindrical, ca. 3 mm, glabrous, longitudinally ribbed. Pappus white, ca. 8 mm.

● Hubei (Fangxian).

Senecio dissectus is known only from the type gathering, A. Henry 6687, which was made in 1885–1888 in Hubei, possibly in Fangxian. It is similar to P. sinicus but differs in having leaves larger, phyllaries and florets 5, achenes shorter, and a pappus white.


掌裂蟹甲草 zhāng xiè jiǎ cáo

Plants erect, 50–100 cm tall. Rhizomes robust, with numerous tomentose fibrous roots. Stem solitary, striate. Leaves long petiolate; lower leaves fallen by anthesis; petiole not winged, 4–7 cm, sparsely shortly pubescent or subglabrous; median leaf blade abaxially pale green or gray-green, adaxially green, broadly ovate-ornicular or pentagonal-cordate, 5–14 × 12–14 cm, abaxially white crisped-hairy or only pubescent on veins, adaxially sparsely apressed shortly hairy or glabrous, pinnately-palmately 5–7-divided; lobes oblong, oblong-lanceolate, or spatulate, rarely linear, 2–9 × 2–4 cm, pinnately lobed, or unequally 2–4-denticulate; terminal lobe larger, lateral lobes narrow and small. Upper leaves smaller, same as middle leaves, shorter petiolate. Capitula many, arranged in terminal racemes or lax panicles, spreading or pendulous after anthesis; peduncles 3–5(–7) mm, with 1 or 2 linear bractlets. Involucres cylindric, 8–10 × 2.5–3 mm; phyllaries 4, green or sometimes becoming purple, linear-oblong, margin narrowly scarious, apically obtuse. Flores 4 or 5, rarely 6 or 7; corolla yellow, 8–12 mm; tube slender, ca. 3 mm; limb narrowly campanulate, lobes ovate-lanceolate. Anthers exerted from corolla, basally ciliate. Style branches excurved, apically truncate, papillose. Achenes cylindric, 5–6 mm, glabrous, ribbed. Pappus white, 5–6 mm. Fl. Jul.–Aug, fr. Sep.–Oct.

Forest understories, forest margins, thickets on slopes; 2400–3800 m. SW and W Sichuan, E Xizang, NW Yunnan [Bhutan].

1a. Stems, rachis, peduncles, and phyllaries sparsely shortly pubescent or subglabrous; leaves abaxially pubescent only on veins ............. 51a. var. palmatisectus

1b. Upper stems, rachis, peduncles, and phyllaries shortly glandular pubescent or glandular hairy; leaves abaxially white crisped-hairy .......... 51b. var. moupinensis

51a. Parasenecio palmatisectus var. palmatisectus

掌裂蟹甲草(原变种) zhāng xiè jiǎ cáo (yuán biàn zhòng)


Stems, rachis, peduncles, and phyllaries sparsely shortly pubescent or subglabrous. Leaves abaxially pubescent only on veins.

● Forest understories, forest margins, thickets on slopes; 2600–3800 m. SW and W Sichuan, E Xizang, NW Yunnan.


掌毛掌裂蟹甲草 xiāng máo zhāng xiè jiǎ cáo

Senecio quinquelobus (Thunberg) Candolle var. moupinensis Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 10: 40. 1887; Cacalia palmatisecta var. moupinensis (Franchet) H. Koyama; C. palmatisectus f. pilipes H. Koyama; C. palmatisectus var. pubescens (Jeffrey) C. Y. Wu; C. pentaloba Handel-Mazzetti var. moupinensis (Franchet) Handel-Mazzetti; Senecio moupinensis (Franchet) C. C. Chang; S. palmatisectus var. pubescens Jeffrey.

Upper stems, rachis, peduncles, and phyllaries shortly glandular pubescent or glandular hairy. Leaves abaxially white crisped-hairy.

Forests, forest margins, secondary thickets on slopes; 2400–2900 m. SW and W Sichuan, E Xizang [Bhutan].


昆明蟹甲草 kūn mín gān xiè jiǎ cáo


Plants (30–)50–90 cm tall. Rhizomes short, stout, 1.5–2 cm in diam., with numerous brown fibrous roots. Stem solitary, green or base purple-tinged striate, stiff, glabrous. Lower leaves small or withered by anthesis; other leaves usually crowded at middle, gradually smaller. Petiole ca. 1/2 as long as blade, unequally shortly winged, without auricle at base; leaf blade abaxially pale green, adaxially dark green, broadly ovate, 7–10 × 6–11 cm, both surfaces glabrous, palmately veined, veins distinctly raised adaxially, base slightly cordate, truncate, or broadly cuneate, palmately 3–7-divided, lobes broadly obovate-spatulate, apex obtuse or slightly acute, terminal lobe ± lobed, lateral lobes 2-lobed or divided, margin sparsely toothed or

Forest understories, forest margins, thickets on slopes; 2400–3800 m. SW and W Sichuan, E Xizang, NW Yunnan [Bhutan].
mucronulate only, thicker in texture. Capitula many, terminal or arranged in upper leaf axis in a branched narrow panicle; branches obliquely ascending; capitula upward arranged in racemes, pendulous, glabrous or sparsely shortly pubescent; bracts of lower part similar to leaves, but smaller; upper bracts linear or linear-lanceolate, 5–6 mm; peduncles (2–)3–5 mm, slender, with 1–3 subulate-linear bractlets, pendulous. Involucres cylindric, 8–9 × 1.5–2 mm; phyllaries 3, pale brown, linear-lanceolate or narrowly lanceolate, 7–9 × 1–1.5 mm, herbaceous, glabrous, margin narrowly or broadly scarious, apically obtuse or slightly acute, puberulent. Florets 3 or 4; corolla yellow, 6–7 mm; limb broadly tubular; lobes lanceolate, ca. 2 mm. Anthers exserted from corolla, basally long caudate. Style branches truncate, papillose. Achenes yellow-brown, cylindric, 4–5 mm, glabrous, ribbed. Pappus white, ca. 5 mm. Fl. Jul–Aug, fr. Oct.

- Lax forests or grasslands on slopes; 1900–3100 m. Yunnan.

*Parasenecio tripteri* is similar to *P. palmatisectus* but differs in the leaf thickness, the type of division of leaves, and the numbers of phyllaries and florets.


#### 假橐吾属 *jia tuo wu shu*

Chen Yilin (陈艺林 Chen Yi-ling); Bertil Nordenstam

Herbs, perennial. Rhizomes robust, short, with many fibrous roots. Stem with relict petioles at base. Leaves alternate, papery, basal leaves persistent by anthesis, long petiolate, oblong-cordate or broadly ovate-cordate, base cuneate, decurrent into winged petiole; petiole basally expanded and subamplexicaul, but not vaginate. Median leaves similar to lower leaves but smaller, shortly petiolate; petiole winged, gradually expanded from middle to base into leaflike ovate auricles, amplexicaul. Capitula discoid, in terminal racemes; peduncles with 2 bractlets. Involucres cylindric or narrowly campanulate, 1.5–2 mm in diam., not calyculate; phyllaries uniseriate, 4, linear-lanceolate, margin narrowly scarious. Receptacle foveolate. Florets 4, discoid, distinctly overtopped by disk, bisexual; corolla yellow, tubular limb narrowly campanulate, 5-lobed; lobes lanceolate, apex acute. Anthers linear, exserted from corolla, basally obtuse, apex with lanceolate appendages, antheropodium cylindric. Style branches excurred, obtuse or truncate, papillose. Achenes cylindric, glabrous, ribbed. Pappus purple-brown, uniseriate, serrulate, caducous.

- One species: China.

This genus is not only in aspect but also in the head arrangement closely related to *Ligularia*; however, it differs by its petioles winged, expanded and subamplexicaul, but not vaginate at base; capitula discoid, in terminal racemes; and florets 4, all tubular. The genus is also related to *Parasenecio* but differs by its anthers obtuse, not caudate at base; stem leaf base with relict petioles; and basal leaves persistent by anthesis.


#### 假橐吾 *jia tuo wu*


Rhizomes short, stout, with many fibrous roots. Stem solitary, erect, 60–100 cm tall, green or becoming purple in lower part, striate, arachnoid and shortly pubescent, glabrescent, base often with withered relict petioles; basal leaves persistent by anthesis, long petiolate; petiole 9–20 cm, basally expanded and subamplexicaul; blade abaxially pale green, oblong-cordate or broadly ovate-cordate, 5.5–13(–16) × 6.5–14.5 cm, papery, abaxially sparsely arachnoid, or later ± glabrescent, adaxially glabrous, midvein stout, lateral veins furcate branched, raised abaxially, impressed adaxially, base deeply cordate, cuneate-decurrent into ca. 1 cm wide winged petiole, margin serrate, apex shortly acuminate or obtuse. Middle stem leaves similar to lower leaves but smaller; petiole shorter, broadly winged, base distinctly expanded into ovate, leaflike, amplexicaul, large auricle, margin brown ciliate. Upper leaves sessile, ovate-lanceolate to lanceolate, base expanded into a denticate-amplexicaul auricle, apex acute or acuminate. Capitula many, discoid, arranged in terminal 20–25(–50) cm racemes; rachis and peduncle densely arachnoid and glandular hairy; peduncles 2–3 mm, with 2 or 3 linear or subulate bractlets. Involucres cylindric or narrowly campanulate, 6–7 × 1.5–2 mm; phyllaries 4, green or becoming purple, linear-lanceolate, 0.5–1 mm, sparsely glandular hairy, margin narrowly scarious, apically slightly acute or obtuse, puberulent. Florets tubular, 4, distinctly overtopping involucres; corolla yellow, ca. 6 mm; limb narrowly campanulate; lobes lanceolate. Anthers exserted from corolla, 3–4 mm, basally obtuse. Style branches excurred, apically truncate, papillose. Achenes brown, cylindric, 3–4 mm, glabrous. Pappus purple-brown or purple. Fl. Jul, fr. Aug–Sep.

- Forests on slopes, grasslands; 1500–2100 m. Gansu, Shaanxi.


#### 兔儿伞属 *tu er san shu*

Chen Yilin (陈艺林 Chen Yi-ling); Bertil Nordenstam

Herbs, perennial, robust. Basal leaves peltate, palmately parted, long petiolate, densely crisped-hairy when young. Cotyledon involute before blade opens; stem leaves alternate, petiole basally amplexicaul. Capitula discoid; florets tubular, many, arranged in terminal corymb or panicles. Involucres narrowly tubular or cylindric, base with 2 or 3 linear bractlets; phyllaries 5, unequal, inner...
phyllaries broader, outer phyllaries narrow. Receptacle flat, glabrous, alveolate. Florets pale white to pale red, bisexual, fertile, irregularly lobed. Anthers basally hastate, appendages shortly acute. Style branches elongate, outside hairy, apically obtuse or triangular. Achenes cylindric, glabrous, many ribbed. Pappus many, unequal or subequal, finely bristly; seedlings with a single cotyledon.

Seven species: E Asia, mainly in China, Japan, and Korea; four species (three endemic) in China.

1a. Capitula arranged in panicles; leaves 12–20(–25) cm in diam. ................................................................. 4. S. subglabrata

1b. Capitula arranged in flat-topped corymbs.

2a. Leaf segments narrow, 2.5–8 mm wide ................................................................. 1. S. aconitifolia

2b. Leaf segments usually broader than 8 mm.

3a. Leaves submembranous when dry; synflorescence branches spreading .................................................... 2. S. australis

3b. Leaves subleathery when dry; synflorescence branches not spreading .................................................... 3. S. hayatae

兔儿伞

*Cacalia aconitifolia* Bunge, Enum. Pl. China Bor. 37. 1833; *Senecio aconitifolius* (Bunge) Turczaninow.

Herbs, erect, 70–120 cm tall. Rhizomes procumbent, short, with many fibrous roots. Stem purple-brown, simple, glabrous. Stem leaves usually 2(or 3). Lower leaves long petiolate, peltate; petiole 10–16 cm, not winged, glabrous, base amphicallic; blade abaxially gray, adaxially pale green, 20–30 cm in diam., palmately parted, segments 7–9, twice 2- or 3-fid, lobes 2.5–8 mm wide, linear-lanceolate, initially reflexed, closed umbraculiform, densely arachnoid-to-mentose, later open umbraculiform, glabrescent, apex acuminate, irregularly reticulate. Median leaf petioles 2–6 cm; blades smaller, 12–24 cm in diam.; segments 4 or 5. Uppermost leaves sessile or shortly petiolate, bractlike, lanceolate. Capitula many, discoid, arranged in dense compound corymbs, 6–7 mm in diam.; peduncles 5–16 mm, with few linear bractlets. Involucres cylindrical; phyllaries 5, oblong-lanceolate, ca. 10 × 2–3.5 mm, apex sparsely villous. Florets 10, all tubular, fertile; corolla 9–10 mm; limb campanulate, ca. 7 mm, lobes lanceolate, ca. 2 mm, apical puberulent. Anthers exserted from corolla, basally hastate. Style branches excruciately, apically penicillate-puberulent. Achenes cylindric, 4–5 mm, glabrous, ribbed. Pappus of many bristles, white or reddish. Fl. Feb–Aug, fr. Oct.

- Forest margins on slopes, roadsides; 700–900 m. Anhui, Zhejiang.

Syneilesis australis is distinguished from *S. aconitifolia* by its larger, submembranous, basally broadly peltate leaves, with broader segments, and synflorescence branches spreading.


台湾兔儿伞


Herbs, rhizomatous. Rhizomes procumbent, short. Stem erect, 80–160 cm tall, ca. 7 mm in diam. in lower part, glabrous, sometimes with bulblets in leaf axils, corymbose branched in upper part. Stem leaves 2, lower leaves long petiolate; petiole to 20 cm, not winged, base amphicallic; blade peltate-ovarilc, ca. 35 cm in diam., subleathery, palmately parted; segments 5–9, 2-fid, lobules 15–20 mm wide, margin irregularly serrate, apex acute. Middle stem leaves smaller, segments few, shortly petiolate. Upper leaves distant, bractlike, linear-lanceolate, gradually smaller upward, apex acuminate. Capitula many, 8–10 mm in diam., arranged in terminal compound corymbs; peduncles 5–16 mm; bracts linear, 3–4 mm. Involucres tubular, 9–10 mm, base with 3 or 4 linear bractlets; phyllaries uniseriate, 4 or 5, oblong, glabrous, margin scarious, apically obtuse. Florets 14–16; corolla white, 1–1.3 cm; tube narrow, 4–5 mm, apex 5-lobed. Anthers black-purple, basally hastate. Ovary cylindric, glabrous. Style branches elongate, apically triangular, puberulent. Pappus of many bristles, reddish, ca. 1 cm, subequal. Fl. May.

- Forest understories; 300–500 m. Taiwan (Miaoli, Xiaozi).

高山兔儿伞 gao shan tu er san


Stem erect, striate, 50–85 cm tall, glabrous, synflorescence branched in upper part, shortly pubescent. Stem leaves 3 or 4, lower leaves peltate; petiole 4–5 cm, basally white villous at nodes; blade abaxially gray, adaxially green, orbicular, 12–20(–25) cm in diam., thick, palmately 5–7-parted, segments obovate, twice 2-parted, lobules lanceolate, 1–1.5 cm wide, both surfaces sparsely pubescent, margin sparsely acutely toothed, apex acuminate. Upper leaves gradually smaller upward, palmately parted or 3-fid, bractlike, linear-lanceolate. Capitula many, arranged in terminal panicles, ca. 10 × 6–8 mm; peduncles 1–4 mm, densely shortly pubescent, with 3 linear bractlets at apex. Involucres tubular, ca. 8.5 × 5–7 mm; phyllaries uniseriate, 5, oblong, ca. 8.5 × 2–3 mm, thick, outside glabrous, apically obtuse, puberulent. Florets 6–8; corolla 8–9 mm, 5-lobed; tube narrow, 2–2.5 mm. Anthers black-purple, basally hastate. Ovary cylindric, glabrous. Style branches elongate, apically puberulent. Pappus of many bristles, sordid white, 7–8 mm. Fl. Jun, fr. Sep.

- Alpine areas in mountains; 1700–2800 m. Taiwan.


款冬属 kuan dong shu

Chen Yilin (陈艺林 Chen Yi-ling); Bertil Nordenstam

Herbs, scapigerous. Rhizomes perennial, repent or procumbent. Leaves developed after anthesis; basal leaves ovate or triangular-cordate. Scapes few, with many bractlike leaves. Capitulum 1, heterogamous, radiate. Involucres campanulate; phyllaries 1- or 2-seriate, equal, lanceolate, apically acuminate. Receptacle flat, glabrous. Florets yellow; ray florets female, numerous, fertile; disk florets functionally male, few; corolla tubular, 5-lobed. Anthers entire or subauriculate at base, filaments apically with equally sized cells. Style entire, apically obtuse, stigma papillose. Achenes narrowly cylindric, 5–10-ribbed. Pappus of many fine bristles, white.

One species: temperate N Africa, Asia, Europe.


款冬 kuan dong

Plants perennial. Rhizomes long creeping, subterranean, brown. Fruiting stems 5–10 cm tall, densely white lanate, with scale-shaped alternate purple-violet bracteate leaves. Basal leaves appearing after anthesis, long petiolate; petiole 5–15 cm, white lanate; blade orbicular-cordate, 3–12 × 3–14 cm, abaxially densely white tomentose, palmately reticulate veined, margin undulate, unequally toothed. Capitula solitary, terminal, 2.5–3 cm in diam., nodding (or drooping) before and after anthesis. Involucres campanulate, 1.5–1.8 cm at fruiting; phyllaries 1- or 2-seriate, linear, white villous, glabrate, sometimes black glandular hairy, apically obtuse, often purple tinged. Ray florets female, many seriate, yellow, radiate; stigma 2-fid. Disk florets few, functionally male; corolla tubular, 5-lobed; anthers sagittate at base; stigma capitate, usually sterile. Achenes cylindric, 3–4 mm. Pappus white, 1–1.5 cm.

Wet places, forest understories, valleys; 600–3400 m. Anhui, Gansu, Guizhou, Hebei, Henan, Hunan, Jiangsu, Jiangxi, Jilin, Nei Mongol, Ningxia, Shaanxi, Sichuan, Xianjiang, Xizang, Yunnan, Zhejiang [India, Nepal, Pakistan, Russia; N Africa, SW Asia, W Europe].

The immature capitula and leaves of *Tussilago farfara* are used medicinally for relieving coughs and improving breathing; the plants are also used as honey plants and are widely cultivated in medicinal gardens in China.


蜂斗菜属 feng dou cai shu

Chen Yilin (陈艺林 Chen Yi-ling); Bertil Nordenstam

*Nardosmia* Cassini.

Herbs, perennial, subdioecious. Rhizomes as stems robust, node-shaped or at least more robust in lower part. Basal leaves long petiolate; blade broadly cordate or reniform-cordate, margin incised or basally lobed, parallel to furcate. Stem leaves bract-shaped, sessile, subamplexicaul. Capitula radiate, disciform or discoid, hetero- or homogamous. Involucres campanulate, basally with bractlets; phyllaries 1–5-seriate, equal. Receptacle flat, glabrous, petiulate. Florets in female capitula fertile; corolla filiform, apex obliquely truncate or ± indistinctly radiate, or lamina longer; functionally male florets: corolla tubular, 5-toothed; anthers entire or obtuse at base, or rarely shortly hastate; style apically clavate, conical, 2-fid, style in female florets filiform, 2-fid. Achenes cylindric, glabrous, ribbed. Pappus of many bristles, white.

Nineteen species: Asia, Europe, North America; six species (two endemic) in China.
1a. Leaves palmate-pinnately divided (segments not to middle), reniform, terminal segment 3-lobed, segments with incised, mucronulate teeth; involucres ovate-oblong, synflorescences corymbose and densely paniculate; female florets indistinctly radiate ................................................................. 1. P. tatewakianus

1b. Leaves undivided, angular or toothed, ± reniform.

2a. Capitula numerous, arranged in cymose panicles or panicles, bracteal leaves ovate-oblong, lanceolate, or ovate-lanceolate, apex acute or acuminate.

3a. Involucres of female capitula campanulate, 8–9 mm, style exerted from corolla, male capitula with peduncles 10–15 mm, peduncles of female capitula stout, 7–15 mm ...................................................... 2. P. formosanus

3b. Involucres of female capitula subcyllindric, 10–12 mm, peduncles as long as capitula or longer, to 8 cm ................................................................................................................................. 3. P. tricholobus

2b. Capitula few, racemose or corymbose, rarely 2- or 3-branched in lower part, bracteal leaves oblong or ovate-lanceolate.

4a. Leaves papery, reniform, 3–5.5 × 5–9 cm; capitula 6–9, arranged in corymbs; peduncles slender, 1–4(–6) cm; involucres obonic, 8–10 mm, female florets shortly radiate, 2- or 3-toothed ......................... 4. P. rubellus

4b. Leaves thin, larger, deeply cordate or orbicular-reniform; capitula numerous, arranged in corymbs or racemes; peduncles ca. 5.5 cm.

5a. Bracteal leaves oblong or ovate-lanceolate, apex obtuse; capitula arranged in dense, terminal corymbs, racemose after anthesis; phyllaries narrowly oblong, apex obtuse .............................................. 5. P. japonicus

5b. Bracteal leaves broadly ovate, stem leaves and lower bracteal leaves lanceolate, apex acuminate; capitula racemose; phyllaries 11–15, linear, apex obtuse or slightly acute ........................................ 6. P. versipilus


掌叶蜂斗菜 zhang ye feng dou cai

Rhizomes long, creeping, 4–10 mm. Scapes of male florets ca. 50 cm tall, of female florets over 50 cm tall, arachnoid-crissed throughout. Bracteal leaves sessile, ovate-oblong, 4.4–5 × 1.5–1.6 cm, densely crisped, parallel veined, margin entire, apex obtuse. Upper bracts oblong, rudimentary. Leaves all basal, long petiolate; petiole 20–30 cm, initially crisped-villous, glabrescent; blade adaxially green, reniform or orbicular-reniform, 19–23 × 20–40 cm, or broader, palmately dissected (not to middle); segments 7–9, cuneate, terminal segment usually 3-lobed, with mucronulate teeth, abaxially densely white crisped, hairs thin, adaxially crisped-puberulent. Male capitula corymbose or paniculate; peduncles 4–8 cm. Synflorescences of male capitula ca. 40 cm, heterogeneous; involucres ca. 7 × 10–14 mm; male florets numerous, filiform, ca. 6 mm, apex truncate, style ca. 8 mm, 2-fid; male florets ca. 6.5 mm, tube narrow, ca. 3.5 mm. Female capitula homogeneous or heterogeneous; ray florets female. Central florets male, purplish or white; involucres hemispheric, ca. 10 × 10 mm, base with linear-lanceolate bracts; phyllaries uniseriate, imbricate, narrowly oblong, crisped-pubescent, apex obtuse. Female florets fertile, filiform, ca. 10 mm; lamina ca. 1 mm, style 2-fid. Male florets: corolla tubular, ca. 10.5 mm, tube narrow, ca. 6 mm, lobes ca. 3 mm; anthers basally 2-fid; filaments nodiform dilated; style slightly exceeding corolla, apex clavately dilated, with small ring below stigma 2-fid, puberulent. Achenes cylindric, 3–3.5 mm, glabrous, apex truncate. Pappus in female florets white, 9–12 mm, finely bristly. Pappus in male florets few, ca. 7 mm, bristly. Fl. Jun–Jul.

Sandy and stony banks of forest rivers and streams, forming huge thickets. Heilongjiang [Russia (Far East, Sakhalin)].


tai wan feng dou cai

Rhizomes long creeping, ca. 1 cm in diam., with many fibrous roots. Stems scapiform, few, fascicled, erect, 25–30 cm tall, simple, densely brown shortly pubescent and arachnoid-lanate. Basal leaves long petiolate; petiole 15–30 cm, base dilated, glabrous; blade adaxially green, cordate or reniform, 5–8 × 7–12 cm, abaxially sparsely arachnoid-pubescent especially on veins, adaxially shortly pubescent, basally palmately veined, thicker, base deeply or slightly cordate, margin with mucronulate teeth, apex rounded. Stem leaves sessile, bractlike, oblong-lanceolate or oblong, rarely ovate-oblong, 2–4(–6) × 1–1.8 cm, densely arachnoid, parallel veined, base subamplexicaul, margin entire, apex acute or acuminate. Capitula numerous, arranged in a paniculate synflorescence; synflorescence of male capitula 8–10 cm wide, synflorescence of female capitula 7–8 cm wide; peduncles 5–20 mm, slender, shortly brown pubescent; bracts 2–5, linear or linear-lanceolate, 4–5 mm. Involucres campanulate, 8–9 × 10–14 mm; phyllaries uniseriate, purple when dry, oblong or oblong-lanceolate, 3- or 4-veined, apex acute or acuminate, sparsely puberulent. Florets in male capitula mostly or entirely male; corolla tubular, 7–10 mm; limb campanulate–funnel-shaped, 5-lobed; lobes ovate, 1–1.5 mm; anthers basally obtuse; style dilated in upper part, 2-fid below stigma, papillose; corolla in female florets filiform, 8–9 mm, apex irregularly 4-lobed; lobes linear, unequal, ca. 2.5 mm; style filiform, exceeding corolla, apex 2-fid. Male florets few in female capitula; peduncles 7–15 mm, stout. Achenes cylindric, glabrous. Pappus of many capillary-like bristles, white, ca. 6 mm. Fl. May.

● Grasslands on mountains; 1500–2500 m. Taiwan.


毛裂蜂斗菜 mao lie feng dou cai

Ligularia petelotii Merrill; Petasites himalaicus Kitamura;
**P. mairei** H. Léveillé; **P. petelotii** (Merrill) Kitamura; **P. vaniotii** H. Léveillé.

Plants subdioecious. Rhizomes short, with numerous fibrous roots, thinly arachnoïd-lanate. Scapes emerging from rhizomes in early spring. Stems of female synflorescences 27–60 cm tall, with scale-shaped leaves; bracteal leaves ovate-lanceolate, 3–4 cm, basal leaves long petiolate; blade broadly reniform-cordate, 2–8 cm, both surfaces white lanate, or later ± glabrescent, palmately veined, margin finely toothed, with cartilaginous mucronulate teeth. Male capitula arranged in terminal corymbs or panicles; corolla tubular, segments lanceolate; style exceeding corolla, stigma capitulate, slightly branched. Female capitula densely arranged in terminal cymose panicles, 8–12 mm in diam.; peduncles 1–2.5(–8) cm, with 1 to few lanceolate bracteal leaves; involucres campanulate, 10–12 mm; phyllaries uniseriate, 10–12, lanceolate or lanceolate-oblong, ca. 7 mm, calyculate; corolla apically 4- or 5-lacerate; segments unequal, filiform or subulate; style exceeding corolla, stigma 2-fid. Achenes cylindrical, glabrous. Pappus of many fine bristles in female florets, in male few, shorter than corolla. Fl. Apr–Jun.

Roadsides, by streams in valleys; 700–4300 m. Gansu, Guizhou, Henan, Qinghai, Shaanxi, Shanxi, Sichuan, Xizang, Yunnan [Bhutan, India, Nepal, Vietnam].

The plants of *Petasites tricholobus* are used medicinally as in *P. japonicus*.


长白蜂斗菜 chang bai feng dou cai

*Tussilago rubella* J. F. Gmelin, Syst. Nat., ed. 13[bis], 2: 1225. 1792; *Nardosmia saxatilis* Turczaninow; *Petasites saxatilis* (Turczaninow) Komarov.

Rhizomes repent, thin, with fibrous roots. Stem solitary, erect, 5–25 cm tall, simple, arachnoïd in upper part. Basal leaves small, long petiolate; petiole 3–10 cm, densely crisped-pubescent, base slightly expanded; blade abaxially pale green, adaxially green, reniform or reniform-cordate, 3.5–5 × (4)5–9 cm, thickly papery, with short, thick hairs on petiole and especially on veins abaxially, base slightly cordate, margin acutely toothed, teeth emarginate, apex rounded. Stem leaves scale-shaped, ovate-lanceolate, 1.5–2 × 0.5–1 cm, glabrous, shortly white ciliate on margin, parallel veined, basally amplexicaul, apically obtuse or slightly acute. Capitula 6–9, arranged in corymbs; peduncles 1–4(–6) cm, slender, with linear bracts. Involucres conical, 8–10 × 5–10 mm; phyllaries biseriate, subequal, narrowly oblong, 1–1.5 mm wide, glabrous or nearly so, apically obtuse. Male florets few, sterile; corolla yellow, ca. 9 mm; tube 3.5–4 mm; limb campanulate, 5-denticulate, lobes ovato-oblong; style basally 2-fid, stigma branches clavate, apex acute, puberulent. Female florets white, 6–7 mm, shortly radiate, apically 2- or 3-denticulate. Achenes oblong, 3–3.5 mm, truncate, costate at bases. Pappus of many fine bristles, white, 9–11 mm. Fl. and fr. May–Jul.

Alpine regions, adjacent forests, forest margins; 1800–2800 m. Ji-lin (Changbai Shan), Liaoning [Korea, Mongolia, Russia (Far East, Siberia)].

### 5. Petasites japonicus (Siebold & Zuccarini) Maximowicz, Award 34th Demidovian Prize, 212. 1866.

蜂斗菜 feng dou cai

*Nardosmia japonica* Siebold & Zuccarini, Fl. Jap. 1843; *Petasites albus* A. Gray (1857), not Linnaeus (1753); *P. liukiuensis* Kitamura; *P. spurius* Miquel; *Tussilago petasites* Thunberg.

Rhizomes creeping, with subterranean procumbent branches, with membranous ovate scales, and numerous fibrous roots. Stems 15–30 cm tall, basally 7–10 mm in diam., simple, densely or laxly shortly brown pubescent. Basal leaves long petiolate; blade adaxially green, orbicular or reniform-orbicular, 15–30 × 15–30 cm, papery, abaxially arachnoid, later glabrescent, adaxially crisped-pubescent when young, base cordate, margin finely toothed. Bracteal leaves oblong or ovate-oblong, 3–8 cm, parallel veined, apically obtuse. Male scapes with numerous capitula (20–30) crowded in a terminal corymb, homogamous; involucres tubular, ca. 6 × 7–8(–10) mm, base with lanceolate bracts; phyllaries biseriate, subequal, narrowly oblong, glabrous, apically obtuse; all florets tubular, functionally male; corolla white, 7–7.5 mm, tube ca. 4.5 mm; anthers basally obtuse; style cladately thickened with small ring below stigma, apex 2-fid. Female scape 15–20 cm tall, densely bracteate, often elongated after anthesis, ca. 70 cm tall, in dense corymbs, rarely branched; capitula homogamous; florets numerous, corolla filiform, ca. 6.5 mm, apex obliquely truncate; stigma distinctly exserted from corolla, capitulate, 2-fid, papillose. Achenes cylindrical, ca. 3.5 mm, glabrous. Pappus of many fine bristles, white, ca. 12 mm. Fl. Apr–May, fr. Jun.

Streamides, grasslands, thickets. Anhui, Fujian, Henan, Hubei, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Zhejiang [Japan, Korea, Russia (Far East)].

The rhizomes of *Petasites japonicus* are used medicinally for treating injuries, trauma, swelling, and fractures, and for detoxification of snakebites. The stalk is cultivated as a vegetable, and the young immature capitula are delicious.


盐源蜂斗菜 yan yuan feng dou cai

Rhizomes with numerous fibrous roots. Flowering scape solitary, 5–15 cm tall, slender, 3–4 mm in diam.; bracts broadly ovate to narrowly lanceolate, ca. 2 cm, abaxially and marginally crisped-hairy, apex long acuminate. Leaves long petiolate, broadly reniform, ca. 2 × as long as broad, subleathery, palmately veined, base deeply cordate, abaxially and petiole crisped, glabrate, densely glandular furfuraceous, margin sparsely cartilaginous, finely mucronate-toothed. Capitula numerous, arranged in lax racemes. Female capitula campanulate, 10–11 mm, narrow; phyllaries brown, 10–15, linear, 1–1.5 mm wide, glabrous, 3-veined, margin broadly brown scarious, apically obtuse or slightly acute, base with few bractlets; peduncles erect or pendulous, slender, apically dilated; florets numerous, exceeding involucres; female florets filiform, 4.5–7 mm; lobes 5, 0.5–0.8 mm; ovary glabrous; style very short, 2-lobed; pap-
pus white, shorter than corolla, connected in a short ring at base. Male florets tubular; tube slender, 2–4 mm; limb campanulate, 2–2.5 mm; lobes ovate, margin involute; anthers very short, base with small auricle; ovary hairy; style not exceeding corolla, stigma clavate; pappus shorter than those in female florets. Fl. Apr–Jun.

- Alpine grassy slopes, forest understories, thicket margins; 2700–3800 m. SW Sichuan, NW Yunnan.

2. Subtribe TEPHROSERIDINAE

狗舌草亚族 gou she cao ya zu

Chen Yilin (陈艺林 Chen Yi-ling), Liu Ying (刘莹), Yang Qiner (杨亲二); Bertil Nordenstam, Charles Jeffrey

Antheropodia cylindric, narrow, without enlarged marginal basal cells; anther endothecial tissue with cell wall thickenings polar, or polar and radial, cells short; stigmatic areas of disk floret styles confluent, contiguous or discrete. $x = 24, 30$, rarely 13.

Three genera and ca. 100 species: Asia, Europe, North America; three genera and 60 species (48 endemic) in China.

1a. Leaves pinnately lobed ............................................................................................................................................ 105. Nemosenecio
1b. Leaves palmately lobed or unlobed.

2a. Disk floret corolla limb campanulate, rarely funnelform; leaves palmately veined, rarely pinnately veined; endothecial cell wall thickenings polar, or radial and polar; involucres calyculate or not; phyllaries 8–17 .................................................................................................................................................... 103. Sinosenecio
2b. Disk floret corolla limb funnelform, never campanulate (except in *T. koreana*); leaves pinnately veined, never palmately veined; endothecial cell wall thickenings polar and radial; involucres not calyculate; phyllaries 13–25 ................................................................................................................................................................... 104. Tephroserts


蒲儿根属 pu er gen shu

Chen Yilin (陈艺林 Chen Yi-ling), Liu Ying (刘莹), Yang Qiner (杨亲二); Bertil Nordenstam, Charles Jeffrey

Herbs, perennial, rarely annual or biennial, erect, rhizomatous, sometimes stoloniferous, with fibrous roots. Stems scapiform, subscapiform, or leafy, often villous or arachnoid-tomentose, at least when young. Leaves simple, petiolate, all or mostly radical or both radical and stem leaves present; radical leaves rosulate, persistent at anthesis except in some species with leafy stems; blade orbicular or reniform to ovate, rarely ovate-oblong or elliptic, palmately or rarely pinnately veined, moderately deeply to shallowly palmately lobed, toothed, angled, or subentire, basally cordate to subtruncate or rarely rounded or cuneate; pedioles of basal leaves sometimes expanded or winged, pedioles of stem leaves sometimes winged, base usually expanded into conspicuous, subamplexicaul, entire or toothed auricle. Capitula solitary to numerous, arranged in terminal subumbelliform simple or compound corymbose cymes, heterogamous, radiate, pedunculate. Involucres not calyculate or very occasionally calyculate, cylindric, obconic, or campanulate to broadly campanulate; receptacle flat or convex, alveolate or ciliate; phyllaries (7 or)8–13(–17), uniseriate (or nearly so), linear to ovate, usually lanceolate, apex and on upper margins ciliate or fimbriate-ciliate, margins scarious. Ray florets 6–18, usually 13; lamina yellow, usually oblong or lanceolate-oblong, 4–10-veined, apically shortly denticate. Disk florets numerous; corolla yellow, limb campanulate, lobes 5. Anthers oblong, basally rounded to obtuse, rarely shortly obtuse-sagittate; antheropodia cylindric, somewhat broader than filament, cells uniform; endothecial cell wall thickenings polar, or polar and radial. Style branches recurved, short, truncate or slightly convex, with apical papillae. Achenes cylindric or obvoid-cylindric, ribbed, glabrous or shortly pubescent on ribs, papillate or smooth. Pappus capillary-form, uniform, white, persistent or rarely caducous, present in all florets, absent from ray florets, or absent from all florets. $x = 24, 30$, rarely 13.

Forty-one species: all occurring in China, mainly in the C and SW regions, only two extending into Myanmar, Thailand, and Vietnam; 41 species (39 endemic) in China.

Several lines of evidence (morphological, cytological, and molecular) strongly indicate that *Sinosenecio* as circumscribed herein is still not a monophyletic group and needs a further re-circumscription, even after *S. koreanus* has been transferred to the genus *Tephroserts* and *S. hainanensis* established as a new genus of its own, i.e., *Hainanecio*. It seems that only those *Sinosenecio* species with $x = 30$ and with strictly polar endothecial cell wall thickenings should be retained in the genus *Sinosenecio* as redefined, whereas those with $x = 24$ (rarely 13), and with polar and radial endothecial cell wall thickenings may be described as a new genus or transferred to the genus *Nemosenecio*. No formal taxonomic treatment at the generic level, however, is made herein pending further study.

1a. Pappus absent in all florets, absent at least in ray florets.
2a. Pappus absent in ray florets only, present in disk florets; ovaries and achenes glabrous in ray florets, pubescent in disk florets .................................................................................................................................................... 23. *S. oldhamianus*
2b. Pappus absent in all florets; ovaries and achenes glabrous in all florets, rarely sparsely glandular.
3a. Leaf blade pinnately veined, cuneate, truncate, or rounded at base ............................................................................. 29. *S. jishouensis*
3b. Leaf blade palmately veined, cordate at base.
14a. Capitula small; involucres 2–3 mm in diam. ................................................................. 28. S. phalacrocarpoides
14b. Capitula large; involucres more than 5 mm in diam.
5a. Petioles of radical leaves not expanded at base; peduncles not dilated distally; receptacle hairy.
6a. Stem scapiform; leaves all basal or subbasal, rosulate.
7a. Capitula usually 1 or 2; leaf blade ovate, broadly ovate-orbicular, or reniform, 2–4–(5) × 2.2–5.5 cm, margin subentire to repand-dentate, apex acuminate or shortly caudate ................................................................. 10. S. homogyniphyllus
7b. Capitula usually 2–9 in subumbelliform corymb; leaf blade ovate or broadly ovate, 4–9 × 4.5–9.5 cm, margin repand or sinuate-dentate, apex rounded ............................................... 11. S. chienii
6b. Stem not scapiform, with 2–5 stem leaves.
8a. Capitula solitary; leaf blade 1.7–5.5 × 2–6.5 cm, adaxially glabrous or very sparsely pubescent, shiny ................................................................. 12. S. yilingi
8b. Capitula solitary or several; leaf blade 5–9 × 5–10 cm, adaxially pubescent, not shiny .......... 13. S. sichuanicus
5b. Petioles of radical leaves expanded at base; peduncles distally dilated; receptacle usually glabrous.
9a. Stem scapiform; leaves all basal or subbasal, rosulate ......................................................... 41. S. qii
9b. Stem leafy; both basal and stem leaves present.
10a. Leaf blade abaxially and phyllaries thinly arachnoid-tomentose at least when young; achenes sparsely glandular ................................................................. 27. S. phalacrocarpus
10b. Leaf blade and phyllaries not arachnoid-tomentose; achenes glabrous.
11a. Leaf blade irregularly 3–5-lobed or repand-dentate; plants stoloniferous or not stoloniferous.
12a. Phyllaries abaxially fulvous villous, glandular puberulent, or subglabrous; plants with long stolons or not stoloniferous ................................................................. 24. S. globiger
12b. Phyllaries abaxially purplish red puberulent; plants with short stolons ............................... 25. S. leiboensis
11b. Leaf blade regularly 7–9-lobed to 1/4–1/2; plants not stoloniferous.
13a. Leaf blade 7–9-lobed to 1/2, at first sparsely puberulent, later glabrescent on both surfaces; lobes oblong-lanceolate; veins yellowish green ...................................................... 26. S. palmatisectus
13b. Leaf blade 7–9-lobed to 1/4–1/3, adaxially pubescent with spreading hairs, abaxially pubescent or sometimes glabrescent; lobes deltoid; veins white ........................................... 30. S. albonervius
13c. Leaf blade 0.8–1.7 × 0.8–2 cm, dark green above; stem subglabrous .................................. 39. S. trinervius
13d. Leaf blade 4–9 × 4.5–9.5 cm, margin repand or sinuate-dentate, apex rounded ............... 36. S. changii
13e. Leaf blade 4–5 × 3–6 cm, dark green above; stem subglabrous ......................................... 40. S. nanchuanicus
13f. Leaf blade 4–5 × 3–6 cm, green above; stem fulvous villous ............................................... 3. S. dryas

1b. Pappus present in all florets, at least when young.
14a. Ovaries and achenes pubescent.
15a. Petioles of stem leaves basally auriculate.
16a. Stem slender, erect or flexuous; stem leaves 1–3; leaf blade adaxially villous with spreading hairs, leaf auricles smaller in size ................................................................. 14. S. latouchei
16b. Stem somewhat stouter, erect; stem leaves 3–7; leaf blade adaxially pubescent with appressed hairs or sparsely or densely white tomentose, leaf auricles larger in size ................................. 15. S. jiuhuashanicus
15b. Petioles of stem leaves basally expanded or winged but not auriculate.
17a. Petioles of stem leaves basally expanded; leaf blade adaxially pubescent or glabrescent, abaxially densely white tomentose, or villous or glabrescent .................................................. 16. S. guangxiensis
17b. Petioles of stem leaves basally winged; leaf blade abaxially sparsely arachnoid, later glabrescent .......... 19. S. hunanensis
14b. Ovaries and achenes glabrous.
18a. Leaf blade pinnately veined.
19a. Leaf blade ovate-oblong or elliptic, base cuneate, sparsely puberulent on both surfaces ........................................ 39. S. trinervius
19b. Leaf blade ovate-oblong, base cordate, floccose-tomentose on both surfaces .......................... 36. S. changii
18b. Leaf blade palmately veined.
20a. Capitula solitary.
21a. Leaf blade ovate-cordate; capitula 4–5 cm in diam.
22a. Leaf blade abaxially densely white lanate; pappus hairs few, shorter than corolla tube, soon deciduous ................................................................. 5. S. cyclaminfolius
22b. Leaf blade abaxially densely fulvous tomentose; pappus hairs numerous, equaling or exceeding corolla tube, persistent ................................................................. 6. S. hederifolius
21b. Leaf blade orbicular or reniform-orbicular; capitula 2–3 cm in diam.
23a. Stem without bracts on upper part ................................................................. 7. S. rotundifolius
23b. Stem with several small bracts on upper part.
24a. Leaf blade 0.8–1.7 × 0.8–2 cm, dark green above; stem subglabrous .......................... 40. S. nanchuanicus
24b. Leaf blade 3–6 × 4–6 cm, green above; stem fulvous villous ........................................... 3. S. dryas
20b. Capitula usually 2 to many.
25a. Stem leafy, usually with at least 4 stem leaves only slightly smaller than basal leaves, rarely fewer.
26a. Petioles of stem leaves basally auriculate.
27a. Plants 20–75 cm tall; leaf blade 2–5 × 3–8 cm; stem villous-pubescent especially basally; pappus 5–6 mm ................................................................. 20. S. euosmus
27b. Plants 35–140 cm tall; leaf blade 4–14 × 6–17 cm; stem sparsely pubescent; pappus 3–4 mm ... 33. S. denticulatus
26b. Petioles of stem leaves basally expanded but not auriculate.
28a. Leaf blade ovate-cordate, not divided, margin denticulate .................................................. 31. S. baojingenesis
28b. Leaf blade reniform, orbicular-reniform, broadly flabellate, or suborbicular, repand-dentate or palmately lobed.
29a. Plants less than 25 cm high; leaf blade 2.5 × 3 cm or less, both surfaces glabrous ................... 17. S. wayiensis
29b. Plants more than 30 cm high; leaf blade 3–6 × 4–6 cm, abaxially variously pubescent.
30a. Leaf blade repand-dentate, sparsely villous or glabrescent abaxially ................................. 32. S. hupingshanensis
30b. Leaf blade palmately lobed, arachnoid or white tomentose abaxially.
31a. Leaf blade 7–9-lobed to 1/2; lobes oblong; phyllaries not purplish on upper margin .......... 22. S. fangianus
31b. Leaf blade shallowly 5–7-lobed, or undivided, only denticulate; lobes broadly deltoid or ovate-deltoid, denticulate; phyllaries purplish on upper margin ............................ 21. S. sungpanensis
25b. Stem scapiform or subscapiform, leafless or with fewer than 4 stem leaves, otherwise with only lanceolate or linear bracts or at most a few reduced, bractlike leaves markedly smaller than radical leaves.
32a. Capitula cylindric; phyllaries 8–10.
32b. Capitula campanulate; phyllaries more than 10.
33a. Leaf blade ovate-cordate or suborbicular.
33b. Leaf blade reniform.
35a. Stem leaves 1 or 2 near base; leaf blade smaller, 4–9 × 5–8 cm, arachnoid abaxially ........ 9. S. subrosulatus
35b. Stem leaves absent or with a bractlike leaf on upper part; leaf blade of basal leaves larger, 7–20 × 5–22 cm, villous abaxially ................................................................. 8. S. ligulariosides
36a. Rhizome collar and stem base densely sericeous-villous; capitula 1–3, up to 3 cm in diam. ............................................................................................................. 4. S. subcoriaceus
36b. Rhizome collar and stem base not densely sericeous-villous; capitula few or many, usually 1–2 cm in diam.
37a. Stem villous with reddish brown hairs, more densely so on lower part; leaf blade ciliate at margin.
37b. Stem subglabrous, sparsely arachnoid, or arachnoid-tomentose; leaf blade not ciliate at margin.
39a. Stem arachnoid-tomentose; leaf blade densely white tomentose abaxially.
39b. Stem subglabrous or sparsely arachnoid; leaf blade usually not white tomentose abaxially, rarely so and later glabrescent.
41a. Leaf blade broadly flabellate or suborbicular, dentate or palmately lobed to 1/2, lobes apically 2- or 3-denticulate, glabrous on both surfaces ................................. 17. S. wayiensis
41b. Leaf blade reniform or suborbicular, regularly 5–7-palmatilobed, lobes ovate-triangular, glabrous on both surfaces or sometimes white tomentose abaxially and later glabrescent ......................................................... 18. S. saxatilis


毛柄蒲儿根 mao bing pu er gen


Herbs, scapigerous. Rhizomes 5–6 mm in diam., densely lanate with long fulvous hairs or sericeous. Stems solitary, erect or somewhat flexuous, to 60 cm tall, lanate with fulvous hairs or sericeous, simple or branched above middle. Leaves few, radical, long petiolate; petiole 5–22 cm, villous with fulvous hairs or sericeous; blade ovate-cordate, 6–13 × 4–10 cm, thickly papery, abaxially densely lanate with fulvous hairs or sericeous, adaxially sparsely sericeous-villous and densely adpressed puberulent, palmately 7–9-veined, veins prominent abaxially, obscure adaxially, base cordate, margin repand-dentate with mucronulate teeth, apex acute or subobtuse, mucronulate. Capitula 8–13 arranged in terminal corymbs, ca. 2 cm in diam.; peduncles 2–4 cm, densely tomentose, ± glabrescent, with a basal linear bract; bracteoles 3 or 4, linear-sulcate, membranous. Involute cylindric, broadly campanulate when flattened, 6–8 × 5–7 mm, not calyculate; phyllaries 8, oblong-lanceolate, 1.5–
3.2 mm wide, glabrescent after anthesis, apex acute, subacute, or acuminate. Ray florets 6–10; corolla tube ca. 3 mm; lamina yellow, oblong, 8–15 × 2–2.5 mm, 4-veined, apically obtuse and 3-denticulate. Disk florets numerous; corolla yellow, 6–11 mm, with 3–4 mm tube and campanulate limb; lobes ovate-triangular, apically acute, papilllose. Anthers ca. 2 mm, basally obtuse to rounded, appendages ovate-oblong. Style branches ca. 0.8 mm, apex truncate, papilllose. Achenes cylindric, ca. 3 mm, smooth, glabrous, ribbed. Pappus white, ca. 6 mm. Fl. Apr–Jun, fr. May–Jul. 2n = 60*.

- Woods, in bushes, on dry rocks near mountain summits; 300–1600 m. E Chongqing, W Hubei, NW Hunan, C Sichuan.

**Sinosenecio eriopodus** is similar to *S. villifer* but is easily distinguished by the ovate-cordate leaf blade, which is abaxially densely lanate with fulvous hairs or sericeous. Specimens from Shizhu, E Chongqing, previously referred to *S. villifer*, belong to this species. Specimens from Luding, W Sichuan, previously identified as this species, actually belong to *S. subcoriaceus*.

2. **Sinosenecio villifer** (Franchet) B. Nordenstam, Opera Bot. 44: 51. 1978 ["villiferus"].

紫毛蒲儿根 zn mao pu er gen

**Senecio villifer** Franchet, J. Bot. (Morot) 8: 362. 1894 ['villiferus']; *Ligularia villifera* (Franchet) Diels.

*Herbs, scapigerous. Rhizomes stout, to 10 mm in diam., clad in persistent blackish brown petiole bases. Stems solitary, erect, scapiform, 25–40 cm tall, with or without few villous bracts, villous with long reddish brown hairs. Leaves few, radical, rosulate, long petiole; petiole 9–11 cm, densely villous or pubescent with long reddish brown hairs; blade suborbicular, 3.5–8.5 × 3.5–11 cm, papery or subleathery, both surfaces villous or pubescent with redish brown hairs, sometimes glabrescent by anthesis, base cordate, margin shallowly repand-dentate with deltoid mucronulate teeth. Capitula radiate, usually 5–8 in terminal subumbelliform corymbs; peduncles 1–2.5 cm, villous with long reddish brown hairs, with basal bract and 2–4 bracteoles; bracteoles linear-subulate, 5–10 mm, membranous, densely villous, 1-veined, apically acute. Involucres cylindrical, obconic-campanulate when flattened, 6–8 × 10–8 × 6–8 mm, not calyculate; phyllaries 10–13, lanceolate or oblong-lanceolate, 8–10 × 2–2.5 mm, herbaceous, densely villous and shortly glandular hairy, margin scarious, apically acuminate and green or reddish purple. Ray florets 10–13, ca. 14 mm; corolla tube ca. 3.5 mm; lamina yellow, ovate-oblong, ca. 11 × 2–2.2 mm, 7-veined, apically 3-denticulate. Disk florets many; corolla yellow, ca. 7 mm, with 3–3.5 mm tube and campanulate limb; lobes oblong-obovate, ca. 2 mm, apex acute, papilllose. Anthers oblong, ca. 2.5 mm, basally obtuse, appendages ovate-oblong. Style branches ca. 1 mm. Achenes (immature) cylindric, 3.5–5 mm, smooth, glabrous. Pappus white, 4–6 mm. Fl. May–Jun, fr. Jul–Aug. 2n = 60*.

- Stony slopes, wooded cliffs; 2000–2100 m. E Chongqing (Wushan), W Hubei.

**Sinosenecio dryas** is similar to *S. villifer* but differs in having plants and leaves smaller, rhizomes slender, and capitula strictly solitary.


革叶蒲儿根 ge ye pu er gen

*Herbs, scapigerous. Rhizomes ca. 5 mm in diam., clad in persistent brownish petiole bases, collar densely sericeous-villous. Stems 1–3, erect, scapiform, 10–40 cm tall, slender, simple, sericeous-villous at base, laxly so in lower part, subglabrous or glabrous in upper part. Leaves several, radical, rosulate, long petiole; petiole 10–20 cm, sparsely villous or subglabrous; blade abaxially pale green or purplish, adaxially green, orbicular, 3–6 × 3–8 cm, subleathery, abaxially glabrous or sparsely villous on veins, adaxially glabrous, palmately veined, base deeply or sometimes shallowly cordate, margin irregularly repand-dentate with broadly deltoid, obtuse, apiculate teeth. Capitula 2.5–3 cm in diam., 1–3 in terminal corymbs; peduncles elongate, slender, with basal bract and 2 or 3 brac-
teoles in upper part; bracteoles linear, 8–15 mm, sparsely vil-

lous, apex acute. involucres broadly campanulate, hemispheric

when flattened, 8–10 × 6–10 mm, calyculate with 4 or 5 linear

bracteoles; phyllaries 16 or 17, oblong-linear, 2–2.5 mm wide,

herbaceous, tomentose at base or glabrous, margin narrowly

scarious, apically purplish, ciliate, and acuminate. Ray florets

10–13; corolla tube 5–5.5 mm, glabrous; lamina yellow, ovate-

oblong, 16–18 × ca. 2.2 mm, 7-veined, apically 3-denticulate.

Disk florets many; corolla yellow, ca. 6.5 mm, with ca. 3.5 mm

tube and funnelform campanulate limb; lobes ovate-lanceolate,

c. 1.5 mm, apically acute. Anthers ca. 2.5 mm, base obtuse to

rounded, appendages ovate-oblong. Style branches ca. 1 mm.

Achenes cylindric, ca. 4.5 mm, smooth, glabrous. Pappus white

or sometimes yellowish at base, ca. 6 mm. Fl. Apr–Jun. fr. May–

Jul. 2n = 60*.

● On rocks below waterfalls, by streams, woods, shaded places;

800–1800 m. Chongqing (Fengdu, Nanchuan).

Sinosenecio suborciacus can be easily distinguished by its rela-

tively larger and fewer capitula. Populations from different habitats vary

greatly in plant and leaf size. Individuals growing in woods are up to 40

cm tall, with larger (up to 8 cm wide) and abaxially green leaf blades,

whereas those growing on rocks below waterfalls are no more than 15

cm tall, with smaller (ca. 3 cm wide), sometimes abaxially purplish leaf

blades.

5. Sinosenecio cyclaminifolius (Franchet) B. Nordenstam, Opera

Bot. 44: 50. 1978.

仙客来蒲儿根 xian ke lai pu er gen

Sinecio cyclaminifolius Franchet, J. Bot. (Morot) 8: 362.

1894.

Herbs, scapigerous, stoloniferous. Rhizomes procumbent

or ascending, slender, with fibrous roots. Stems solitary or few,

erect, scapiform, equaling or exceeding leaves, 10–30 cm tall,

or ascending, slender, with fibrous roots. Stems solitary, erect,

purplish, scapiform, ca. 20 cm tall, simple,

or ascending, slender, with fibrous roots. Stems solitary, erect, purplish,

scapiform, ca. 20 cm tall, simple,

or ascending, slender, with fibrous roots. Stems solitary, erect, purplish,

scapiform, ca. 20 cm tall, simple,

or ascending, slender, with fibrous roots. Stems solitary, erect, purplish,

scapiform, ca. 20 cm tall, simple,

or ascending, slender, with fibrous roots. Stems solitary, erect, purplish,

scapiform, ca. 20 cm tall, simple,
green or deep green, orbicular or rarely reniform-ombiculur, 1.5–2 × 1.5–2 cm, abaxially sparsely fulvous arachnoid, glabrescent to glabrous, adaxially glabrous, palmately 5–7-veined, veins ± raised abaxially, base cordate, margin subentire or sometimes repand, teeth mucronulate, apex rounded. Capitula terminal, solitary, radiate, 1.5–2 cm in diam. Involucres campanulate, 6–7 × 7–8 mm, not calyculate, densely tomentose below capitulum; phyllaries 13–15, oblong-lanceolate, 1–1.5 mm wide, glabrous, margin narrowly scarious, apically acuminate, purplish, puberulent. Ray florets 11–13, rarely 15; tube 3–3.5 mm; lamina yellow, oblong, 2.5–3 mm wide, 4-veined, apically denticulate. Disk florets numerous; corolla yellow, 5–6 mm, with ca. 2 mm tube and campanulate limb; lobes ovate-lanceolate, apically acuminate, puberulent. Anthers oblong, 2.5–3 mm, basally obtuse. Style branches recurved, apically truncate, papillose. Anthers oblong, 2.5–3 mm, base obtuse to rounded, dark purple and ciliate. Ray florets 8–10; corolla tube 4.4–5 mm; lamina yellow, linear-oblong, 10–11 × 1.5–2 mm, 4-veined, apically 3-denticulate. Disk florets numerous; corolla yellow, 8–9 mm, with 4–4.5 mm tube and campanulate limb; lobes oblong-lanceolate, ca. 1.5 mm, apically acute. Anthers linear-oblong, ca. 3 mm, base obtuse to rounded, appendages ovate-lanceolate. Style branches ca. 1.5 mm. Achenes cylindric, ca. 2.5 mm, smooth, glabrous, ribbed. Pappus white, ca. 6 mm. Fl. Jun–Jul, fr. Jul–Aug. 2n = 60*.

- Woods, in bush; 2400–3000 m. S Gansu, Sichuan (Songpan).

Sinosenecio rotundifolius is somewhat similar to S. dryas in leaf shape and the solitary capitula, but it differs by its rhizomes with short internodes and stem without bracts. In S. dryas, the rhizomes have very long internodes, and the stem bears 3–5 lanceolate bracts. The two species also differ in habitat preference and geographical range.


莲座蒲儿根


Herbs, scapigerous. Rhizomes robust, densely lanate at collar with fulvous silky hairs. Stems solitary, exceeding leaves, ca. 50 cm tall, ca. 4 mm in diam. at base, fulvous villous, simple, sometimes with 1 bractlike leaf in upper part. Leaves radical, rather few, rosulate, long petiolate; petiole stout, to 35 cm, sparsely reddish villous; blade adaxially pale green, reniform, 7–20 × 5–22 cm, thickly papery, abaxially sparsely pubescent-villous, adaxially glabrous, palmately 5–7-veined, with numerous ascending fuscate secondary veins, prominently reticulate abaxially, base cordate, margin irregularly coarsely dentate with large deltoid callose-mucronulate teeth. Capitula ca. 1.5 cm in diam., rather numerous (5–26) in flat-topped terminal corymbs; peduncles 1–4.5 cm, slender, pubescent-villous, bracteate at base and few bracteate below capitula; bracts and bracteoles linear or linear-lanceolate, 5–12 mm. Involucres cylindric, campanulate when flattened, ca. 8 × 5–6 mm, not calyculate; phyllaries ca. 10, oblong, 1.5–2 mm wide, herbaceous, glabrous or subglabrous, conspicuously 3-veined, margin broadly scarious, apically obtuse to subacute, purplish red, and puberulent. Ray florets ca. 8; corolla tube ca. 4 mm, glabrous; lamina yellow, oblong, ca. 8 × 2–2.2 mm, 4-veined, apically 3-denticulate. Disk florets numerous; corolla yellow, 6–6.5 mm, with ca. 3 mm tube and campanulate limb; lobes ovate-lanceolate, ca. 1.5 mm, apex acute. Anthers linear-oblong, ca. 2 mm, base obtuse to rounded. Style branches recurved, truncate, papillose.

Achenes cylindric, ca. 2.5 mm, smooth, glabrous, ribbed. Pappus white, ca. 6 mm. Fl. Jun–Jul, fr. Jul–Aug. 2n = 60*.

- Grassy or rocky slopes; 1600–2300 m. Sichuan (Baoxing, Emei, Hongya).

Recognizable by the large, reniform leaves, Sinosenecio ligularioides is very similar to Ligularia, but the petioles are not sheathing at the base.


莲座蒲儿根


Herbs, subscaigerous. Rhizomes procumbent, slender, ca. 3 mm in diam., clad in scalelike persistent petiole bases. Stems solitary, erect, or ascending in lower part, scapiform, 20–35 cm tall, at first arachnoid-tomentose, glabrescent to subglabrous, simple. Leaves radical or subradical, rosulate, long petiolate; petiole 6–8 cm, slender, densely arachnoid-tomentose, glabrescent to glabrous, basally expanded; blade adaxially green or dark green, reniform, 4–9 × 5–8 cm, membranous, abaxially at first grayish or fulvous arachnoid, ± glabrescent, adaxially glabrescent, base cordate, margin subentire, repand or sometimes dentate with deltoid mucronulate teeth. Capitula 1.5–2 cm in diam., 2–5 in lax terminal corymbs; peduncles 1–6 cm, slender, sparsely arachnoid and puberulent, bracteate at base and 2- or 3-bracteolate in upper part; bracts and bracteoles linear-subulate or linear. Involucres cylindric, obconic or campanulate when flattened, 5–8 × 3–5 mm, not calyculate. Phyllaries ca. 10, lancelolate or oblong-lanceolate, 5–7 × 1–1.5 mm, herbaceous, glabrous or sparsely pubescent at base, margin narrowly scarious, apically acute, dark purple and ciliate. Ray florets 8–10; corolla tube 4.4–5 mm; lamina yellow, linear-oblong, 10–11 × 1.5–2 mm, 4-veined, apically 3-denticulate. Disk florets numerous; corolla yellow, 8–9 mm, with 4–4.5 mm tube and campanulate limb; lobes oblong-lanceolate, ca. 1.5 mm, apically acute. Anthers linear-oblong, ca. 3 mm, base obtuse to rounded, appendages ovate-lanceolate. Style branches ca. 1.5 mm. Achenes cylindric, ca. 2.8 mm, smooth, glabrous. Pappus white, 8–9 mm. Fl. Jun–Jul, fr. Jul–Aug. 2n = 60*.

- Woods, in bushes; 2700–4100 m. S Gansu, Sichuan.


肾叶蒲儿根


Herbs, scapigerous. Rhizomes ca. 2 mm in diam., densely villous with long fulvous hairs and clad in persistent brownish petiole bases. Stems solitary, erect, scapiform, 10–30 cm tall, simple, sparsely villous, with long fulvous hairs, especially at base and near apex, usually with 1–4 linear-spatulate bracts in upper part. Leaves few to several, radical, rosulate, long petio-
olate; petiole 2.5–9 cm, densely villous, with long fulvous hairs or sometimes subglabrous; blade abaxially green or purple, adaxially green, ovate, broadly ovate-ovulicural, or reniform, 2–4(–5) × 2.2–5.5 cm, membranous, sparsely villous on both surfaces, palmately 5–7-veined, base cordate, margin repand-dentate or subentire, with obscure mucronulate teeth, apex rounded. Capitula ca. 2 cm in diam., solitary or 2(–7) arranged in lax terminal subumbelliform corymbs; peduncles 2–3.5 cm, slender, with a basal linear bract and a few linear-spatulate bracteoles in upper part. Involucres obconic, 4–5 × 3–6 mm, not calyculate; phyllaries 7–10, rarely 13, oblong or oblanceolate, 1–1.5 mm wide, herbaceous, dark green, or purplish in upper part, apex obtuse to acuminate and fimbriate-ciliate. Receptacle rather convex, hairy. Ray florets 8–17, ca. 12.5 mm; corolla tube ca. 3 mm, glabrous; lamina oblong, 9–9.5 × 3–3.5 mm, 4-veined, apically 3-denticulate. Disk florets many; corolla yellow, ca. 4.5 mm, with ca. 3 mm tube and campanulate limb; lobes ovate-lanceolate, ca. 1.2 mm, apically acute. Anthers linear-oblong, ca. 2 mm, basally obtuse to rounded, appendages ovate-lanceolate. Style branches recurved, ca. 0.8 mm. Achenes obovoid-cylindric, 2–2.5 mm, smooth, glabrous. Pappus absent, rarely of several hairs, soon deciduous. Fl. Apr–Jul, fr. Jun–Aug. 2n = 60*.

- Woods, stream sides, grasslands, damp places; 800–2800 m. W Sichuan.


雨农蒲儿根  yu nong pu er gen


Herbs, scapigerous. Rhizomes ca. 4 mm in diam., villous with long fulvous hairs and clad at nodes with persistent brownish petiole bases. Stems solitary or paired, erect, scapiform, 20–30 cm tall, simple, fulvous villous or ± glabrescent. Leaves few to several, radical, rosulate, long petiolate; petiole 10–15 cm, rather stout, fulvous villous, ± glabrescent; blade abaxially pale green or purplish, adaxially green or dark green, ovate or broadly ovate, 4–9 × 4.5–9.5 cm, submembranous, abaxially sparsely villous and glabrescent, adaxially sparsely fulvous pilose, basally palmately 5–7-veined, veins prominent, base cordate, margin repand or sinuate-dentate with broadly deltoid callose-apatulate teeth, apex acuminate or shortly caudate, apiculate. Capitula ca. 2.5 cm in diam., 2–9 in terminal subumbelliform corymbs; peduncles 2.5–7 cm, slender, with a basal bract and 1–5 linear bracteoles. Involucres obconic-campanulate, 6–7 × 3.5–5 mm, not calyculate; phyllaries 8–10, lanceolate, 4–5 × 1.5–2 mm, herbaceous, sparsely villous or subglabrous, obscurely 3-veined, apically fulvous ciliate and purplish, acute to obtuse. Receptacle slightly convex, alveolate-ciliate. Ray florets ca. 10, ca. 12 mm; corolla tube 1.5–2 mm; lamina oblong, 8–10 × 2.5–3.5 mm, 4-veined, apically 3-denticulate and obtuse. Disk florets many; corolla yellow, ca. 4 mm, with ca. 1.5 mm tube and broadly campanulate limb; lobes lanceolate, ca. 1.5 mm, apically acute. Anthers oblong, ca. 1.5 mm, appendages ovate-oblong, basally obtuse to rounded. Style branches recurved, ca. 0.7 mm. Achenes obovoid-cylindric, ca. 2.7 mm, smooth, glabrous. Pappus absent or rarely of several ca. 1.5 mm hairs, soon deciduous. Fl. Apr–Jul, fr. May–Aug. 2n = 60*.

- Woods, stream sides, grasslands, damp places; 800–2800 m. W Sichuan.

The record of the occurrence of Sinosenecio chienii in Lijiang, NW Yunnan, is a mistake resulting from the incorrect note of the collecting locality of a specimen.

Sinosenecio chienii is closely related to S. homogyniphyllus, and they are largely sympatric in geographical range. It differs from S. homogyniphyllus mainly by its larger, ovate or broadly ovate leaves, acuminate or shortly caudate at the apex and with repand or sinuate-dentate margin. Although both species are readily distinguishable from each other as to populations from Emei, Hongya, and Tianshan, their delimitation becomes rather obscure in other sites, e.g., Baoshan, Leibo, Mabian, and Shifang. Further studies are needed to clarify their relationships.


艺林蒲儿根  yi lin pu er gen

Herbs, subscapigerous. Rhizome 2–3 mm in diam. Stems solitary or sometimes several, erect, 10–40 cm tall, simple, densely sericeous at base, sparsely sericeous or glabrescent in upper part. Leaves several, both radical and stem leaves present. Radical leaves usually 1–3, long petiolate; petiole 4–9 cm, densely sericeous at base, sparsely or so or glabrescent in upper part; blade abaxially pale green, adaxially green to dark green, shiny, reniform or broadly ovate, 1.7–5.5 × 2–6.5 cm, thinly leathery to membranous, glabrous or very sparsely pubescent on both surfaces, palmately veined, base cordate or deeply so, margin repand or dentate with mucronulate teeth, apex obtuse or sometimes acute. Stem leaves 2–5, smaller, with shorter petioles. Capitula solitary, terminal, 2.5–3 cm in diam.; peduncle sparsely sericeous or glabrescent in lower part, densely sericeous in upper part. Involucres obconic, 7–10 × 5–7 mm, not calyculate; phyllaries 11–13, green, oblong or oblanceolate, 1.5–2.5 mm wide, herbaceous, subglabrous, apex acute or acuminate, fimbriate-ciliate. Ray florets ca. 13; corolla tube ca. 2.5 mm, glabrous; lamina yellow, oblong-elliptic, ca. 10 × 3 mm, 6- or 7-veined, apically 3-dentate. Disk florets many; corolla yellow, ca. 4 mm, with ca. 3 mm tube and campanulate limb; lobes ovate-lanceolate. Anthers ca. 2 mm, base obtuse, appendages ovate-oblong. Style branches ca. 1 mm. Achenes obovoid-cylindric, ca. 1.5 mm, smooth, glabrous. Pappus absent. Fl. May–Jun, fr. Jun–Jul. 2n = 60*.

- Deciduous broad-leaved forests; 2100–2200 m. Sichuan (Baoxing).

Sinosenecio yilingii resembles S. homogyniphyllus but is readily distinguishable by the presence of 2–5 stem leaves, the axadially shiny leaf blades, and the strictly solitary capitula. They are also somewhat different in phenotype when they grow together. At the type locality of S. yilingii, both species occur in the same ravine. However, individuals of S. yilingii usually grow in shaded places along forest margins or on streamsides and flower in May and June, while those of S. homogyniphyllus prefer more open, sunny places and flower in June and July.

四川蒲儿根 *si chuan pu er gen*

Herbs, subsapugrigerous, with radical and 2 or 3 stem leaves; stolons absent. Rhizomes 6–7 mm in diam. Stems solitary or several, erect, 20–30 cm tall, simple, densely fulvous sericeous at base, sparsely so in upper part. Leaves several, both radical and stem leaves present. Radical leaves 1 or 2, long petiolate; petiole 6–14 cm, pubescent, densely sericeous at base; blade abaxially pale green, adaxially green, cordate or broadly cordate to reniform in outline, 5–9 × 5–10 cm, submembranous, both surfaces pubescent, palmately veined, base deeply cordate to cordate, margin repand or sinuate-dentate with micromacular teeth, apex acuminate or acute, apiculate. Stem leaves 2 or 3, smaller, with shorter petioles. Capitula solitary or several, 3.5–4 cm in diam.; peduncles 4–8 cm, sparsely fulvous sericeous in lower part, fulvous sericeous in upper part. involucres obconic-campanulate, 5–8 × 8–12 mm, ecalyculate. Phyllaries 13, green, oblong or oblong-lanceolate, ca. 8 × 2–3 mm, herbaceous, fulvous sericeous, apex acuminate or acute and fimbriate-ciliate. Ray florets 12 or 13; corolla tube ca. 2 mm, glabrous; lamina oblong or oblong-lanceolate, ca. 7 × 7 mm, not calyculate; phyllaries ca. 13, oblong-lanceolate, 6–7 × 1.5–2 mm, herbaceous, sparsely arachnoid to glabrous, inconspicuously 3–5-veined, margin broadly scarious, apically acute to obtuse, purplish red and ciliate. Ray florets 11–13; corolla tube 3.5–4 mm, glabrous; lamina yellow, oblong, 7–10 × 2.5–3 mm, 4-veined, apically 3-denticulate, obtuse. Disk florets many; corolla yellow, 4–5 mm, with 2–2.5 mm tube and campanulate limb; lobes lanceolate, 1–1.2 mm, apically acute. Anthers ca. 1.3 mm, basally obtuse, appendages ovate-triangular. Style branches ca. 0.8 mm. Achenes ca. 2 mm, puberulent, papillate. Pappus white, ca. 4 mm. Fl. Mar–May, fr. May–Jun. 2n = 48*.

- Wet places, canal sides, wet rocky cliffs, woods; 200–400 m. Fujian (Nanping, Shaowu, Wuyi), Jiangxi (Lichuan, Nanfeng, Ningdu).

*Sinosenecio latouchei* is closely related to *S. jiuhuashanicus* but differs in the stem slender, erect or flexuous; stem leaves 1–3; leaf blade adaxially villous with spreading hairs; and leaf auricles smaller in size.


九华蒲儿根 *jiu hua pu er gen*

Herbs, subsapugrigerous or with leafy stems. Rhizomes 5–8 mm in diam., collar white tomentose and clad in remains of persistent petiole bases. Stems solitary or several, erect, 13–40 cm tall, simple, villous with multicellular hairs and white with ± decidual floccose tomentum. Radical leaves few, rosulate, long petiolate; petiole 3.5–6 cm, densely brown villous and ± arachnoid-tomentose, basally expanded; blade orbicular, 2–5 × 2–6 cm, abaxially white floccose-tomentose, adaxially pressed pubescent and at first sparsely to densely white tomentose, palmately 5–7-veined, base cordate, margin repand-dentate, with broad micromacular teeth. Stem leaves 3–7, rarely 2; blade similar to basal ones; petiole winged in lower part, expanded into rounded subamplexicaul auricle; auricles larger or smaller upward; uppermost leaves sometimes sessile, blade confluent with auricle. Capitula usually 3–9 arranged in terminal corymbs, ca. 2 cm in diam.; peduncles 1–8 cm, densely white tomentose, not bracteate. Involucres campanulate, ca. 7 × 8 mm, not calyculate; phyllaries ca. 13, oblong-lanceolate, ca. 7 × 1.5–2 mm, white arachnoid-tomentose, ± glabrescent, margin broadly scarious, apically acute or acuminate, reddish purple and ciliate. Ray florets ca. 15; corolla tube 1.5–2 mm; lamina yellow, oblong, 7.5–8 × 1.5–1.7 mm, 4-veined, apically 3-denticulate, obtuse. Disk florets many; corolla yellow, ca. 6 mm, with 1–1.5 mm tube and campanulate limb; lobes ovate-oblong,
ca. 1 mm, apically acute. Anthers ca. 1.2 mm, basally obtuse to rounded, appendages lanceolate. Style branches ca. 0.8 mm. Achenes cylindric, ca. 2 mm, sparsely puberulent, papillate. Pappus white, ca. 2 mm. Fl. Mar–May, fr. May–Jun. 2n = 48*.

- Canal sides, shaded wet places, woods, on rocks near mountain summits; 200–1700 m. Anhui, E Hunan, Jiangxi.

**Sinosenecio jiuhuashanicus** is closely related to *S. latouchei* but differs in the stem somewhat stouter, erect; stem leaves 3–7; leaf blade adaxially pubescent with appressed hairs, or sparsely or densely white tomentose; and leaf auricles larger in size.


广西蒲儿根 guang xi pu er gen

Herbs, scapigerous or subscapigerous. Rhizomes 5–10 mm in diameter, collar densely fulvous tomentose and clad in persistent petiole bases. Stems solitary, erect, subscapiform, 10–35 cm tall, slender, simple, brown villous in lower part, sparsely so to subglabrous in upper part. Radical leaves few, rosulate, long petiolate; petiole 2–6 cm, rather stout, densely fulvous villous, basally somewhat expanded; blade adaxially green or deep green, suborbicular or reniform, 2–7 × 2.5–9 mm, thickly papery or subleathery, abaxially densely white tomentose or sometimes sparsely villous and glabrescent, and then often deep purplish red, adaxially sparsely to somewhat densely fulvous hispid, palmately 5–7-veined, base cordate, margin coarsely dentate or dentate with ovate-deltoid or shallowly ovate-deltoid mucronulate teeth. Stem leaves usually 1–5, similar to radical ones but smaller upward on stem and with shorter petioles slightly expanded but not auriculate at base. Uppermost leaves bractiform, few, linear or linear-lanceolate, 1–1.5 cm, apically acute. Capitula (1 or) 2–7 or more arranged in terminal corymb, 1.5–1.8 cm in diameter.; peduncles 1–5.5 cm, slender, sparsely puberulent or subglabrous, usually bracteate at base and 1–3-bracteolate in upper part; bracts and bracteoles linear, 3–6 mm, apically callose-mucronulate. Involucres campanulate, hemispheric when flattened, 5–8 × ca. 7 mm, calyculate; calyculus of 8–10 bracteoles; bracteoles linear, 3–5 mm, apically callose-mucronulate. Phyllaries ca. 13, oblong-lanceolate, 6–7 × 1.5–2.5 mm, herbaceous, glabrous or subglabrous, apically ± acute, reddish purple and ciliate. Ray florets ca. 13, uniseriate; corolla tube ca. 2 mm; lamina yellow, oblong, 10–11 × 2–3 mm, apically 3-denticulate. Disk florets numerous, 3.5–4 mm, with ca. 1.5 mm tube and campanulate limb; lobes ovate-lanceolate. Anthers oblong, basally obtuse, ca. 1.3 mm. Style branches recurved. Achenes cylindrical, ca. 2 mm, glabrous, papillate. Pappus white, 2–3 mm. Fl. Apr–Sep. 2n = 48*.

- Montane meadows, rocky cliffs; 1200–2200 m. Fujian (Chong'an), Jiangxi.

In the protologue of *Sinosenecio wuyiensis*, the achenes were incorrectly described as sparsely puberulent.


武夷蒲儿根 wu yi pu er gen

Herbs, rhizomatous, with leafy stems or subscapigerous. Rhizomes slender, clad in persistent petiole bases. Stems erect or oblique, (6–)10–23 cm tall, slender, simple or rarely branched, sparsely arachnoid in lower part, glabrous above. Radical leaves rosulate, long petiolate; petiole 3–5 cm, basally slightly expanded; blade abaxially purplish red or green, adaxially green, broadly flabelliform or suborbicular, 1.5–2.5 × 1.5–3 cm, papery or subleathery, both surfaces glabrous, palmately 5–7-veined, coarsely dentate or palmately lobed to 1/2, base cordate or truncate; lobes broadly oblong, 5–6 × 6–7 mm, apically 2–3-denticulate. Stem leaves 2–4 (or 5), similar to radical ones; blade 1.5–2.5 cm, shortly petiolate; petiole slightly expanded and subamplexicaul at base; uppermost leaves sessile, bractlike, ob lanceolate to linear, margin 3–5-lobose or sometimes entire. Capitula usually 1–3, rarely more, arranged in terminal subcorymbs, ca. 2 cm in diameter.; peduncles 2–3.5 cm, slender; bracteoles linear, 5–15 mm, margin entire or sometimes 2–3-denticulate. Involucres campanulate, hemispheric when flattened, 5–6 × 8–10 mm; phyllaries ca. 13, oblong-lanceolate, 1.5–1.5 mm wide, herbaceous, sparsely pubescent or subglabrous, inconspicuously 3-veined, margin scarious, apically acute, purplish and ciliate. Ray florets 13 or 14; corolla tube ca. 2 mm; lamina yellow, oblong, 10–11 × 2–3 mm, apically 3-denticulate. Disk florets numerous, 3.5–4 mm, with ca. 1.5 mm tube and campanulate limb; lobes ovate-lanceolate. Anthers oblong, basally obtuse, ca. 1.3 mm. Style branches recurved. Achenes cylindrical, ca. 2 mm, glabrous, papillate. Pappus white, 2–3 mm. Fl. Apr–Sep. 2n = 48*.

- Montane meadows, rocky cliffs; 1200–2200 m. Fujian (Chong'an), Jiangxi.

In the protologue of *Sinosenecio wuyiensis*, the achenes were incorrectly described as sparsely puberulent.


岩生蒲儿根 yan sheng pu er gen

Herbs, scapigerous or subscapigerous. Rhizomes short, slender, clad in persistent black-brown petiole bases. Stems solitary, erect, 3–12 cm, simple, glabrous or subglabrous. Radical leaves several, rosulate, long petiolate; petiole slender, densely yellow lanate, basally slightly expanded, pilose at upper part; blade abaxially purplish, adaxially green, reniform or suborbicular, 0.5–1 × 1.5–1.5 cm, subleathery, both surfaces glabrous or sometimes white tomentose abaxially and later glabrescent, inconspicuously palmately 5-veined, base cordate or rarely subtruncate, margin reflexed when dry, palmately regularly 5–7-lobed; lobes ovate-triangular, apex acute, mucronulate. Stem leaves 1–3, lower leaves similar to radical leaves but smaller, shortly petiolate, 3–5-lobed; uppermost ones sessile, oblanceolate or spatulate, or sometimes bract-shaped, linear, 2–3 mm. Capitula solitary, sometimes 2, 10–15 mm in diameter. Involucres broadly campanulate, ca. 5 × 7–8 mm, not calyculate; phyllaries 11–13, oblong-lanceolate, ca. 1 mm wide, herbaceous, ob-
scurely 3-veined, glabrous, margin narrowly scarious, apically acute or rather acute. Ray florets 11–13; corolla tube ca. 2 mm; lamina yellow, oblong, 5–6 × ca. 1.5 mm, 5-veined, apically 3-denticulate. Disk florets many; corolla yellow, 3–3.5 mm, with ca. 1 mm tube and campanulate limb; lobes ovate-lanceolate, apically acute. Anthers oblong, basally obtuse. Style branches recurved. Achenes cylindric, ca. 1 mm, glabrous, papillate. Pappus white, ca. 2 mm. Fl. May–Jun, fr. Jun–Jul. 2n = 48*.

● Mountain summits, on rocks, among grasses; 1200–1700 m. Guangdong (Ruyuan), Hunan (Lanshan, Yizhang).

Sinosenecio saxatilis resembles S. wayiensis in posture, plant size, achene morphology, and habitat preference, but it differs in its leaf blade reniform or suborbicular, regularly 5–7-palmatifoliate, lobes ovate-triangular, sometimes abaxially white tomentose and later glabrescent. These two species, together with S. latouchei, all have smaller chromosomes and papillate achenes and most likely constitute a very natural group of species.


湖南蒲儿根  hu nan pu er gen


Herbs, with leafy stems. Rhizomes 5–6 mm in diam., clad in remains of petiole bases, tomentose at collar. Stems solitary, erect, ca. 40 cm, simple, sparsely arachnoid, glabrescent to glabrous. Radical leaves few, rosulate, long petiolate; blade reniform, ca. 4 × 5 cm, membranous, both surfaces thinly arachnoid but soon ± glabrous, palmately 5-veined, base cordate, margin palmately shallowly duplicate-lobed or duplicate-dentate into ca. 9 deltoid, apically calllose-mucronulate, laterally dentate short lobes or coarse teeth. Stem leaves 3, smaller, with narrow lobes and teeth, shortly petiolate; petiole winged at base, wings shortly decurrent. Capitula 5 or 6 arranged in terminal subumbelliform corymb; peduncles ca. 2 cm, densely fulvous puberulent, with filiform bract. Involucres cupuliform, 6–8 mm in diam., not calyculate; phyllaries ca. 13, elliptic-oblong, 7–8 × ca. 2.5 mm, herbaceous, margin scarious, glabrous, apex acute and ciliate. Ray florets ca. 10; corolla tube ca. 3.5 mm, glabrous; lamina yellow, oblong-linear, ca. 13 × 2.5 mm, 4-veined, apically 3-denticulate. Disk florets many; corolla yellow, ca. 6 mm, with slender tube and funnelform limb; lobes lanceolate, apically acute. Anthers oblong, basally obtuse; appendages lanceolate. Style branches recurved. Achenes cylindric, ca. 1.5 mm, puberulent. Pappus white, ca. 4.5 mm. Fl. Mar.

● Forest margins on slopes. Hunan (Yizhang).

Sinosenecio hunanensis is currently known only from a single locality. The type specimen consists of one plant with the synflorescence missing. The species is similar to S. euosmus in leaf shape and texture but differs by the petioles of stem leaves winged at base, the wings shortly decurrent, and the achenes puberulent. Geographically, they are also disjunct. From S. sungpanensis it differs in the puberulent achenes and ± glabrous leaves. On the basis of geographical distribution and the puberulent achenes, this species seems more closely related to S. latouchei and S. jiuhuashanicus, but it is easily distinguished by the leaves not white tomentose and the petiole not auriculate at the base.


耳柄蒲儿根  er bing pu er gen


Herbs, stoloniferous, with leafy stems. Rhizomes ascending or procumbent, slender. Stems solitary, erect, 20–75 cm or taller, ca. 6 mm in diam. at base, simple, ± villous or arachnoid-tomentose, especially in lower part, sometimes glabrescent in upper part. Radical leaves withered by anthesis; median stem leaves long petiolate; blade adaxially green, ovate, broadly ovate, or reniform, 2–5 × 3–8 cm, abaxially arachnoid-tomentose or villous on veins or rarely subglabrous, adaxially villous, sparsely arachnoid, shortly pubescent, or subglabrous, base shallowly cordate to subtruncate, margin shallowly to sometimes rather deeply palmately divided into 5–13 lobes or large teeth; lobes subdeltoid, shallowly crenate or shallowly to deeply mucronulate-dentate, apex rounded to acute. Upper leaves smaller. Uppermost leaves linear, bractlike. Petiole 1–2 × as long as blade, ± villous arachnoid or subglabrous, those of lower leaves not auriculate, slightly expanded at base, those of median and upper leaves usually gradually expanded into ovate or orbicular, entire or dentate subamplexicaul auricles, rarely all leaves inconspicuously auriculate. Capitula 5–15 or more arranged in terminal subumbelliform corymb or compound corymb; peduncles 0.5–5.5 cm, slender, sparsely to densely ascending villous, sometimes with a linear basal bract, without or sometimes with a subulate bracteole. Involucres subcampanulate, 4–6 × 2.5–6.5 mm, not calyculate; phyllaries ca. 13, lanceolate or linear-lanceolate, ca. 1 mm wide, herbaceous, glabrous or subglabrous, margin membranous, apically acute, purplish and ciliate. Ray florets 10–13; corolla tube ca. 2 mm, glabrous; lamina yellow, oblong or linear-oblong, 3.5–4 × ca. 1.5 mm, 4-veined, apically 3-denticulate. Disk florets many; corolla yellow, ca. 4 mm, with ca. 2 mm tube and campanulate limb; lobes oblong, apically acute. Anthers ca. 1.5 mm, basally obtuse to rounded, appendages lanceolate. Style branches ca. 1 mm. Achenes cylindric, ca. 1.8 mm, smooth, glabrous. Pappus white, 5.5–6 mm. Fl. Jun–Aug, fr. Jul–Sep. 2n = 48*.

Woods, grasslands, stream sides; 1800–4000 m. Gansu, Hubei, Shaanxi, Sichuan, Yunnan [Myanmar].

Sinosenecio euosmus is a rather widespread species, which shows great variation in the size and shape of leaf auricles, the indumentum along the stem, and the degree of division of leaves. Its close putative relatives include S. fangianus, S. sungpanensis, and perhaps also S. oldhamianus.


松潘蒲儿根  song pan pu er gen

Herbs, stoloniferous, with leafy stems. Rhizomes 6–8 mm in diam., clad in persistent brown petiole bases. Stems solitary, erect, 40–50 cm tall, 5–6 mm in diam. at base, simple, purplish below, at first sparsely white arachnoid-tomentose, glabrescent. Radical leaves withered by anthesis; lower stem leaves long petiolate; petiole 6–7 cm, somewhat white arachnoid, basally expanded; blade adaxially green, reniform, 3–3.5 × 4–4.5 cm, abaxially densely white tomentose, adaxially sparsely shortly pubescent to subglabrous, palmately divided into 5–7 lobes, or undivided, only denticulate; lobes broadly deltoid or ovate-deltoid, usually coarsely few denticulate and apiculate. Upper stem leaves similar, but shortly petiolate, smaller. Uppermost leaves lanceolate, margin denticulate or entire. Capitula 2–2.5 cm in diam., usually 4 or 5 arranged in terminal subumbelliform corymb; peduncles 2–5 cm, sparsely arachnoid, basally bracteate and sometimes with a median subulate bracteole. Involucres broadly campanulate, ca. 10 × 7–12 mm, not calyculate; phyllaries 15–17, oblong-elliptic, 2–2.5 mm wide, herbaceous, sparsely villous, glabrescent, upper margin purplish red and ciliate, apically acute. Ray florets 12 or 13; corolla tube 4.5–5 mm, glabrous; lamina yellow, oblong, ca. 9 × 2 mm, apically denticulate. Disk florets many; corolla yellow, 6.5–7 mm, with ca. 3.8 mm tube and campanulate limb; lobes lanceolate, ca. 1.5 mm, apically acute. Anthers ca. 1.5 mm, basally obtuse to rounded, appendages lanceolate. Style branches ca. 1 mm. Achenes cylindric, ca. 1.8 mm, glabrous, papillate. Pappus white, 5.5–6 mm. Fl. Jun–Jul, fr. Jul–Aug. 2n = 48.

- Montane meadows, woods; 3300–4300 m. Sichuan (Hongyuan, Songpan).

**Sinosenecio sungpanensis** differs from **S. euosmus** in the leaf blade abaxially white tomentose, involucres larger, and petiole bases only expanded but never auriculate. It is very similar to **S. fangianus** in posture, the palmately lobed leaf blade abaxially white tomentose, the petioles basally expanded but never auriculate, and the achenes glabrous yet papillate. It differs from **S. fangianus** in the leaf blade shallowly 5–7-lobed or undivided, only denticulate, the lobes broadly deltoid or ovate-deltoid, and the phyllaries purplish on upper margin.


**Chishui pu er gen**

Herbs, stoloniferous, with leafy stems. Rhizomes 4–5 mm in diam. Stems solitary, erect, 30–60 cm tall, simple, sparsely white pubescent. Radical leaves withered by anthesis, petiolate; blade adaxially green, reniform, 3–6 × ca. 6 cm, abaxially white arachnoid or pilose, ciliate on margin, adaxially glabrous or sparsely pilose, palmately 5-veined, base deeply cordate, 7–9–palmatifolied nearly to middle; lobes oblong, 1.5–2.5 × 1–2 cm, margin entire or sometimes 2–3-denticulate, obtuse. Median and upper stem leaves similar to lower leaves, but smaller; petioles of lower leaves 3–7 cm, basally expanded, sparsely shortly pubescent. Uppermost leaves small, bractlike, 3–5–lobed or entire, shortly petiolate or subsessile. Capitula radiate, usually 4 or 5 arranged in terminal corymb, rarely solitary, 2.5–2.5 cm in diam.; peduncles 1.5–2 cm, slender, sparsely shortly pubescent with 1 bract. Involucres campanulate, 4–5 × 5–7 mm, not calyculate; phyllaries ca. 15, lanceolate or broadly lanceolate, 1.5–2 mm wide, glabrous, 1–3-veined, margin white ciliate and narrowly scarious, apically acuminate. Ray florets ca. 13; corolla tube ca. 2 mm; lamina yellow, oblong or linear-oblong, 8–10 × 1–1.5 mm. Disk florets many, yellow, with 1.5–2 mm tube and campanulate limb; lobes ovate-lanceolate, apically puberulent. Anthers oblong, ca. 1.5 mm, basally obtuse. Style branches recurved. Achenes cylindric, ca. 1 mm, glabrous, papillate. Pappus white, ca. 3 mm. Fl. Jun–Jul, fr. Jul–Aug.

- Grassy slopes, forest margins, in bushes, canal sides in ravines; 2300–3200 m. Sichuan (Lixian, Maowen).

**Sinosenecio fangianus** differs from **S. sungpanensis** by the leaves 7–9-palmatifolied to the middle, the lobes oblong, and the phyllaries not purplish on upper margin.

23. **Sinosenecio oldhamianus** (Maximowicz) B. Nordenstam, Opera Bot. 44: 50. 1978.

**Senecio oldhamianus** Maximowicz, Bull. Acad. Imp. Sci. Saint-Pétersbourg 16: 219. 1871; **S. martini** Vaniot; **S. savatieri** Franchet; **Sinosenecio savatieri** (Franchet) B. Nordenstam.

Herbs, annual or biennial, rhizomatous, with leafy stems. Stems solitary or few, erect, 40–80 cm or taller, sparsely villous and arachnoid, glabrescent to subglabrous. Radical leaves withered by anthesis, long petiolate; lower stem leaf petioles 3–6 cm, white arachnoid, basally somewhat expanded; blade adaxially green, ovate-ombilicate or suborbicular, 3–5(–8) × 3–6 cm, membranous, abaxially white arachnoid, sometimes ± glabrescent, adaxially sparsely arachnoid or subglabrous, palmately 5-veined, base ciliate, margin shallowly to deeply duplicate-dentate or duplicate-serrate with mucronulate teeth, apex obtuse to acute, acuminate and mucronulate. Upper leaves shortly petiolate, smaller, with ovate or ovate-deltoid, basally cuneate blades; uppermost leaves ovate or ovate-lanceolate. Capitula numerous, arranged in compound terminal corymb; peduncles 1.5–3 cm, slender, sparsely pubescent, usually with a basal linear bract. Involucres broadly campanulate, 3–4 × 2.5–4 mm, not calyculate; phyllaries ca. 13, oblong-lanceolate, ca. 1 mm wide, herbaceous, with membranous margins, white arachnoid or puberulent to glabrous, apically acuminate and sometimes purplish. Ray florets ca. 13; corolla tube 2–2.5 mm, glabrous; lamina yellow, oblong, 8–9 × 1–2 mm, 4-veined, apically 3-denticulate, obtuse. Disk florets numerous; corolla yellow, 3–3.5 mm, with 1.5–1.8 mm tube and campanulate limb; lobes ovate-oblong, ca. 1 mm, apically acute. Anthers oblong, 0.8–0.9 mm, basally obtuse, appendages ovate-oblong. Style branches recurved. Achenes cylindric, ca. 1.5 mm, smooth and glabrous in ray florets, puberulent and papillate in disk florets. Pappus absent in ray florets, in disk florets white, 3–3.5 mm. Fl. Jan–Dec. 2n = 26.

Forest margins, stream sides, wet rocky and grassy places, margins of cultivated fields; 400–2200 m. Anhui, Chongqing, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hebei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shanxi, Sichuan, Yunnan, Zhejiang [Myanmar, Thailand, Vietnam].
**Sinosenecio oldhamianus** is a rather derived species in the genus with respect to floral morphology, chromosome number, and habit. Its achenes have differentiated into two types: those in ray florets larger in size, glabrous, and epappose, and those in disk florets smaller, puberulent, and pappose. Its chromosome number is $2n = 26$, the lowest in the genus. It is the only annual or biennial species of *Sinosenecio* and is the commonest and most widespread one to exhibit weedy tendencies.

### 24. Sinosenecio globiger (C. C. Chang) B. Nordenstam, Opera Bot. 44: 50. 1978

杫艻蒲儿根 *pu zhi pu er gen*

*Herbs, long stoloniferous or not stoloniferous, with leafy stems. Rhizomes 6–10 mm in diam., clad in persistent petiole bases; stolons slender, distally leafy or remotely leafy at nodes. Stems 1–3, erect, 30–80 cm tall, to 6 mm in diam. at base, not branched below synflorescence, sparsely arachnoid, pubescent, villous, puberulent, or glandular. Radical leaves several, rosulate, long petiolate; petiole 6–15 cm, sparsely to densely villous or glandular with long hairs, rarely subglabrous, basally expanded; blade abaxially pale green, adaxially green, ovate-cordate, broadly ovate, or reniform, 2.5–21 × 3–22 cm, papery, abaxially sparsely pubescent or glabrous, adaxially sparsely pubescent or glabrous, palmately 3–5-lobed, obtuse, broadly deltoid, mucronulate, apex obtuse-acuminate-mucronulate. Achenes subequal and glabrous, with 1.5–1.8 mm tube and campanulate limb; lobes oblong-cylindric, ca. 2 mm, smooth, glabrous. Pappus absent. Fl. Apr–Jun, fr. May–Jul. 2n = 48*, 72*.


Two types of plants have been observed within *Sinosenecio globiger* var. *globiger*, one with stolons and the other without. The two types have almost the same geographical distribution, but so far, both types were found to co-occur only in one site of SW Hubei. They seem to have differentiated to some extent in habitat preference, flowering time, and also in some morphological characters. The stoloniferous type has long stolons and a simple synflorescence, flowers in May and June, and grows in woods, whereas the estoloniferous type has a branched synflorescence, flowers in April, and usually grows along streamsides. At this site, only one individual was found to be a possible hybrid between the two types. Further studies are needed to determine if the two types are worthy of formal taxonomic recognition.


止艻蒲儿根 *xian bao pu er gen*


- Streamsides, roadsides, forest margins; ca. 2100 m. Chongqing (Nanchuan), Guizhou (Zheng’an).

Morphologically, *Sinosenecio globiger* var. *adenophyllus* can be readily distinguished from the typical variety and may be recognized as an independent species of its own.


雷波蒲儿根 *lei bo pu er gen*

*Herbs, shortly stoloniferous, with leafy stems. Rhizome elongated, ca. 4 mm in diam. Stems solitary, erect, ca. 60 cm tall, ascending and 5–6 mm in diam. at base, villous, with brownish hairs. Radical and lower stem leaves withered by anthesis; median stem leaves 3 or 4; petiole 7–9 cm, basally somewhat expanded, villous, with fulvous multicellular hairs; blade broadly ovate or reniform, 4–5 × 5.5–7.5 cm, papery, abaxially sparsely pilose mainly on veins, adaxially sparsely pilose, palmately 5–7-lobed, apex obtuse, mucronulate; lobes broadly triangular, teeth callose-mucronulate, lateral callose-unidenticulate. Upper stem leaves shorter petiolar, smaller. Uppersmost leaves shortly petiolar, lanceolate. Capitula 5–9 in terminal corymb; peduncles 0.5–1 cm, puberulent, basally bracteate. Involucres oboconic-campanulate, hemispheric when flattened, 5.6–5 × 5–6 mm, not calyculate; phyllaries 13–15, green, oblong-elliptic, 5–
6 × 2–2.5 mm, herbaceous, abaxially purplish red puberulent, white fimbriate on upper margins and apex, margin scarious, apically acute. Ray florets 13; corolla tube ca. 2 mm, glabrous; lamina yellow, oblong, 9–10 × 2.5–3 mm, 4-veined, apically 3-denticulate, obtuse. Disk florets many; corolla yellow, ca. 3 mm, with 1.8 mm tube and campanulate limb; lobes lanceolate, ca. 1.5 mm, apically acute. Anthers oblong, basally obtuse, ca. 1.5 mm, appendages lanceolate. Ovary cylindric, ca. 1 mm, smooth, glabrous; style branches recurved. Pappus absent. Fl. May–Jun, fr. Jun–Jul. 2

2.5 mm, appendages lanceolate. Ovary cylindric, ca. 1 mm, smooth, glabrous; style branches recurved. Pappus absent. Fl. Apr, fr. May–Jun. 2n = 48*.

Sinosenecio leiboensis is very similar to S. globiger in posture, leaf shape, and the epappose achenes. From the latter, it differs only in the phyllaries purplish puberulent abaxially and in the presence of short stolons.


鄂西蒲儿根 e xi pu er gen

Herbs, with leafy stems. Rhizomes ca. 8 mm in diam. Stems solitary, erect, to 55 cm, 5–6 mm in diam. at base, simple, sparsely pubescent when young, glabrescent. Radical leaves few, long petiolate; petiole 6–16.5 cm, ± glabrous, rather dilated at base; blade abaxially pale green, adaxially green, reniform, 5–15 × 5.5–18 cm, submembranous, both surfaces at first sparsely pubescent or glabrous, palatomely yellowish green 5–7-veined, base broadly cordate or subtruncate, palmatelely 7–9-lobed to middle; lobes oblong-lanceolate, laterally 2–3-dentate or lobulate with callose-mucronulate teeth or lobules, apically acute or acuminate, mucronulate. Stem leaves usually 2–4, lower leaves similar to radical ones, upward smaller, shortly petiolate; uppermost leaves ovate-lanceolate, base cuneate, margin 5–7-dentate or lobulate, apex acute or acuminate. Capitula 2.5–3 cm in diam., 3 or 4(–7), arranged in terminal or axillary subumbelliform corymbs; peduncles 3–5.5 cm, stout, expanded at apex, sparsely fulvous villous, not bracteate. Involucres obconic-campanulate, 7–8 × 6–8 mm; phyllaries 13, oblong-lanceolate, ca. 2 mm wide, 3–5-veined, sparsely fulvous villous, apex rather acute or obtuse, white ciliate. Ray florets ca. 11; corolla tube 2–2.5 mm, glabrous; lamina yellow, oblong-elliptic, ca. 11 × 3–4 mm, 4-veined, apically 3-denticulate, obtuse. Disk florets many; corolla yellow, ca. 3 mm, with ca. 1.5 mm tube and campanulate limb; lobes ovate-lanceolate, apically acute. Anthers oblong, ca. 1.5 mm, basally obtuse, appendages ovato-oblong. Ovary cylindric, 1.3–1.5 mm, smooth, glabrous; style branches recurved. Pappus absent. Fl. Apr, fr. May–Jun. 2n = 48*.

Wet places on slopes, woods; ca. 1400 m. W Hubei (Leibo).

Sinosenecio palmatisectus is very similar to S. albonervius in the leaves palmately divided but differs by the leaf blade at first sparsely pubescent adaxially, later glabrescent, 7–9-palmatifoliated to the middle, the lobes oblong-lanceolate, and the veins yellowish green adaxially.


秃果蒲儿根 tu guo pu er gen

Herbs, rhizomatous, with leafy stems; upper parts arachnoid-tomentose. Stems solitary, erect, ca. 30 cm or taller, robust, hollow, 5–6 mm in diam. at base, not branched below synflorescence. Radical leaves long petiolate, withered by anthesis; median stem leaf petiole 5–7 cm, basally slightly expanded, thinly arachnoid; blade adaxially green, reniform, ca. 6 × 8–9 cm, abaxially thinly arachnoid-tomentose, adaxially sparsely pubescent, palmately 5-veined, margin irregularly sublobed or coarsely dentate, with apically mucronulate deltoid teeth. Upper leaves smaller, shallowly cordate, shortly petiolate. Capitula 5 to many, arranged in terminal and axillary subumbelliform corymbs, ca. 2.5 cm in diam.; peduncles 0.5–2.5 cm, distally slightly dilated, basally not bracteate, sparsely arachnoid-tomentose, glabrescent, not bracteolate. Involucres hemispheric when flattened, ciliate; phyllaries ca. 10, green, lanceolate, herbaceous, sparsely arachnoid or glabrescent, 3-veined, margin scarious, apically ciliate, acute or acuminate. Ray florets ca. 13; corolla tube 2–2.5 mm, glabrous; lamina yellow, oblong, ca. 13 × 3 mm, 4-veined, apically 3-denticulate. Disk florets many; corolla yellow, ca. 4.5 mm, with 1.5–1.7 mm tube and campanulate limb; lobes lanceolate, apically acute. Anthers ca. 1.5 mm, basally obtuse, appendages lanceolate. Style branches ca. 0.8 mm. Achenes cylindric, ca. 1.5 mm, sparsely minutely glandular puberulent. Pappus absent. Fl. Jun.

Sides of rocks, forest margins. Guangdong (Bei Jiang).

Sinosenecio phalacrocarpus is very likely related to S. globiger but differs by the leaf blade abaxially arachnoid-tomentose and the achenes glandular puberulent.


假光果蒲儿根 jia guang guo pu er gen


Herbs, dwarf, with leafy stems. Rhizomes 3–4 mm in diam., clad in persistent brown petiole bases. Stems solitary, to 10 cm tall, branching from near base, sparsely arachnoid, glabrescent. Radical leaves several, long petiolate; petiole 5–8 cm, rather stout, basally slightly expanded, glabrous; blade abaxially pale green, adaxially dark green, subreniform or suborbicular, 3–4 × 3.5–4 cm, glabrous, basally 3-veined, base shallowly cordate or subtruncate, margin palmately shortly duplicate-lobed or coarsely duplicate-dentate, with apically mucronulate deltoid teeth or lobes. Stem leaves 4 or 5, shorter petiolate, smaller. Uppermost leaves ovate-deltoid, lobed or denticate. Capitula small, rather numerous, arranged in contracted terminal compound corymbs; peduncles campanulate, very short, 2–3 mm, sparsely arachnoid or glabrous, not bracteate. Involucres campanulate, 2–3 mm in diam., not calyculate; phyllaries 8 or 9, subseriate, linear, ca. 0.5 mm, herbaceous, glabrous, margin broadly scarious, denticate in upper part, apex acuminate. Ray florets ca. 6; corolla tube ca. 1.5 mm; lamina yellow, ovate-oblong, ca. 1.5 × 0.5–0.6 mm, inconspicuous 4-veined, margin repand, apically rounded. Disk florets ca. 9; corolla yellow, ca. 2.5 mm, with ca. 1.3 mm tube and campanulate limb; lobes
ovate-oblong, apically acute. Anthers ca. 1 mm, basally obtuse, appendages ovate-oblong. Style branches ca. 0.5 mm. Achenes cylindric, 1–1.3 mm, smooth, glabrous. Pappus absent. Fl. Mar.

- Mixed forests; ca. 2700 m. W Yunnan (Yongde).

**Sinosenecio phalacrocarpoides** is distinct in its very small capitula, many arranged in contracted corymbs, very short peduncles, and duplicate-dentate leaves. From the absence of the pappus, this species may be somewhat related to *S. globiger* and its allies.


吉首蒲儿根  ji shou pu er gen

Herbs, rhizomatous, with leafy stems, without stolons. Stems solitary or several, erect, to 40 cm tall, simple, pubescent. Basal leaves long petiolate; petiole 4–16 cm, sparsely pubescent, basally expanded; blade elliptic-lanceolate, 4–14 × 2–5 cm, papery or thinly so, both surfaces sparsely pubescent, pinately veined, lateral veins 6–10, base broadly cuneate, margin irregularly sinuate-dentate, apex acute or acuminate. Stem leaves similar but smaller, with shorter petioles. Capitula 5 to many in terminal corymbs; peduncles 1–2 cm, pubescent, apically dilated. Involucres campanulate, 5–7 × 6–8 mm; phyllaries ca. 13, oblong-lanceolate, 6–7 × 1.5–2 mm, herbaceous, pubescent, apically acute to subacute. Ray florets ca. 13; corolla tube ca. 3 mm, glabrous; lamina yellow, oblong-elliptic, 8–10 × 3–4 mm, 4-veined, apically 3-denticulate. Disk florets numerous; corolla ca. 4 mm, with ca. 2 mm tube and campanulate limb; lobes ovate-lanceolate. Anthers ca. 1.5 mm, basally obtuse, appendages ovate-oblong. Style branches ca. 1 mm. Achenes cylindric, ca. 1.5 mm, smooth, glabrous. Pappus absent. Fl. Mar.–Apr, fr. May. 2n = 48*, 96*.

- Wet soil on limestone, along streams, below waterfalls; ca. 300 m. NW Hunan (Jishou).

**Sinosenecio jishouensis** is readily distinguishable by the pinnately veined leaves and epappose achenes. This species is related to *S. globiger* and its allies in habit and floral structure.


白脉蒲儿根  bai mai pu er gen

Herbs, rhizomatous, with leafy stems; stolons absent. Rhizomes ca. 6 mm in diam. Stems solitary or several, erect, 24–45 cm tall, simple, pubescent or glabrous. Radical leaves long petiolate; petiole 8–20 cm, pubescent or sometimes glabrescent, base expanded, not auriculate; blade abaxially pale green, adaxially matte green, reinnorm to orbicular-reniform in outline, 3–13 × 4–13 cm, submembranous, abaxially pubescent with spreading hairs or sometimes glabrescent, adaxially pubescent, palmately white veined, base shallowly to deeply cordate, shallowly palmately 7–9-lobed to 1/4–1/3, apex acute to obtuse; lobes deltoid, margin remotely denticulate. Upper stem leaves smaller, with shorter petioles. Capitula many in apical compound corymbs; peduncles 1–3 cm, distally expanded, sparsely fulvous villous. Involucres campanulate, 7–8 × 8–9 mm, ecalyculate; phyllaries 12 or 13, green, oblong-lanceolate, ca. 7 × 2 mm, herbaceous, sparsely fulvous villous or sometimes glabrescent, apex fimbriate-ciliate and acuminate or acute. Ray florets 9–13; corolla tube 2–3 mm, glabrous; lamina yellow, oblong-elliptic, ca. 10 × 3 mm, 4-veined, apically 3-denticulate. Disk florets many; corolla ca. 4 mm, tube ca. 3 mm, limb campanulate; lobes ovate-lanceolate. Anthers ca. 1.7 mm, base obtuse, appendages ovate-oblong. Style branches ca. 0.6 mm, apex truncate. Achenes cylindric, ca. 2 mm, smooth, glabrous. Pappus absent. Fl. Apr, fr. May–Jun. 2n = 48*.

- Shaded places along streamsides; 800–1200 m. Hubei (Wufeng), Hunan (Shimen).

**Sinosenecio albonervius** resembles *S. palmatisectus* but differs in the leaf blade adaxially spreading pubescent, 7–9-palmatilobed to 1/4–1/3, the lobes deltoid in outline, and the veins white adaxially.


保靖蒲儿根  bao jing pu er gen

Herbs, rhizomatous, with leafy stems, without stolons. Stems solitary, erect, 75–150 cm tall, simple, villous or lanate. Basal leaves petiolate; petiole 14–28 cm, sparsely lanate, basally expanded, not auriculate; blade adaxially green, ovate-cordate, 12–20 × 10–18 cm, abaxially pale green or whitish lanate, adaxially sparsely villous, palmately veined, base cordate, margin denticulate, apically acute. Upper stem leaves similar but smaller, with shorter petioles. Capitula numerous in terminal compound corymbs; peduncles 1.5–4 cm, sparsely villous. Involucres campanulate, 6–7 × 6–9 mm; phyllaries ca. 13, oblong-lanceolate, 6–7 × 1.5–2 mm, herbaceous, puberulent, apically acute. Ray florets ca. 13; corolla tube ca. 3 mm, glabrous; lamina yellow, oblong-elliptic, ca. 8 × 3–4 mm, 4–7-veined, apically 3-denticulate. Disk florets numerous; corolla ca. 5 mm, with ca. 3 mm tube and campanulate limb; lobes ovate-lanceolate. Anthers ca. 1.5 mm, basally obtuse, appendages ovate-oblong. Style branches ca. 1 mm. Achenes cylindric, ca. 1.5 mm, smooth, glabrous. Pappus white, ca. 3 mm. Fl. Mar.–Apr, fr. May. 2n = 48*.

- Open hillside, in grass beside rice fields; ca. 300 m. NW Hunan (Baojing).

**Sinosenecio baojingensis** is similar to *S. denticulatus* in the leafy stem, tall stature, and smooth, pappose achenes, but it differs by its leaf blade ovate-cordate with margin denticulate and petioles not auriculate. It is the tallest species known in the genus, up to 150 cm.


壶瓶山蒲儿根  hu ping shan pu er gen

Herbs, rhizomatous, with leafy stems; stolons absent. Rhizomes ca. 10 mm in diam. Stems solitary, erect, 16–60 cm tall, simple, pubescent. Radical leaves long petiolate; petiole 5–20 cm, pubescent, base expanded, not auriculate; blade abaxially pale green, adaxially green, reinnorm to orbicular-reniform, 4.5–12 × 5–13 cm, abaxially sparsely villous or sometimes glabrescent, adaxially pubescent, palmately veined, base shallowly to deeply cordate, margin very indistinctly repand-dentate, apex obtuse to acute. Upper stem leaves smaller, with shorter petioles. Capitula many in apical compound corymbs; peduncles 1–4 cm, pubescent or sometimes sparsely to densely villous. In-


volucres campanulate, 7–10 × 6–7 mm, ecalyculate; phyllaries 10–14, green, oblong-lanceolate to oblong-oblancoate, ca. 7 × 1.5 mm, herbaceous, pubescent, apex subentire-ciliate and acuminate or acute. Ray florets ca. 13; corolla tube ca. 3 mm, glabrous; lamina yellow, oblong-elliptic, 10–14 × 2.5–4 mm, 6- or 7-veined, apically 3-denticulate. Disk florets many; corolla ca. 5 mm, tube ca. 4 mm, limb campanulate; lobes ovate-lanceolate. Anthers ca. 1.5 mm, base obtuse, appendages ovate-oblong. Style branches ca. 0.8 mm, apex truncate. Achenes cylindric, 1.5–1.5 mm, smooth, glabrous. Pappus white, ca. 3 mm. Fl. Apr–May, fr. May–Jun. 2

dritic, 1–1.5 mm, smooth, glabrous. Pappus white, ca. 3 mm. Fl. Apr–May, fr. May–Jun. 2n = 48*.

- Broad-leaved forest margins; 1000–1600 m. Hubei (Wufeng), Hunan (Shimen).

Sinosenecio lupinshanensis is similar to S. baotingensis and S. denticulatus in posture, the ray floret lamina 6- or 7-veined, and the achenes glabrous and pappose. From the former, it differs in the leaf blade reniform or orbicular-reniform, margin repand-dentate, smaller size, and much shorter stature; from the latter, it differs in the achenes expanded basally but never auriculate and the shorter stature.

33. Sinosenecio denticulatus


- On rocks, roadsides, shaded places; 1400–2500 m. Chongqing (Wulong), Guizhou (Jiangkou, Songtao).

Sinosenecio fanjingshanicus is similar to S. septilobus in the leaf blade axially white tomentose but differs in the leaf blade axially whitish or pale green, hardly divided, repand, or irregularly shallowly lobed.


- Herbs, subscapigerous, with leafy stems. Rhizomes 3–5 mm in diam., clad in persistent petiole bases. Stems usually solitary, erect, 30–35 cm tall, 2.5–3 mm in diam. at base, simple, sparsely white arachnoid or subglabrous. Radical leaves several, rosulate, long petiolate; petiole 9–12 cm, sparsely villous, glabrescent, basally slightly expanded; blade axially green, orbicular, 3.5–5 × 4–8 cm, axially densely white tomentose, axially thinly adpressed arachnoid to rarely subglabrous, base deeply cordate, margin usually deeply palmately 7–9-lobed to base, lobes deltoid, margin entire or inconspicuously dentate, apex obtuse to rounded, mucronate. Stem leaves 1 or 2, smaller, palmately lobed, shortly petiolate. Capitula 1.5–2 cm in diam., 7–13 arranged in terminal ± subumbrelliform corollas; peduncles 1–3(–7) cm, slender, with a basal oblanceolate or leaflike or 3–7-lobed bract, with 1 or 2 linear bracts in upper part, sparsely pubescent. Involucres campanulate, subhemi-spheric when flattened, 5–6 × 4.5–5.5 mm, not calyculate; phyllaries ca. 13, ovate-oblong or lanceolate-oblong, rarely linear, 1.5–2.5 mm wide, herbaceous, sparsely arachnoid, margin broadly scarious, apically obtuse to subacute and ciliate. Ray florets ca. 13; corolla tube 2.5–3 mm; lamina yellow, oblong, 6–7 × 1.5–2 mm, 4-veined, apically 3-denticulate. Disk florets many; corolla yellow, ca. 4 mm, with ca. 2 mm tube and campanulate limb; lobes lanceolate, 1–1.5 mm, apically acute. An-
thers oblong, ca. 1.4 mm, appendages ovate-lanceolate. Style branches recurved, ca. 0.7 mm. Achenes cylindric, ca. 1.5 mm, smooth, glabrous. Pappus white, ca. 3 mm. Fl. May–Jul, fr. Jun–Jul. 2n = 48*.

- Thickets, on rocks, in bushes, roadsides; 400–2300 m. Chongqing (Nanchuan), Guizhou (Daozhen).

**Sinosenecio septilobus** is easily distinguished by its leaves 7–9-pinnatifid, palmately lobed to the middle, green adaxially owing to the absence of white tomentum, and densely white tomentose abaxially.


Herbs, scapigerous. Rhizomes 5–10 mm in diam., clad in persistent brown petiole bases. Stems solitary, rarely 2, erect, scapiform, 10–40 cm tall, villous with brown hairs, especially in lower part, usually with 1 ovate or spatulate bract-like leaf in upper part. Leaves several, radial, rosulate; petiole 3.5–10 cm, densely villous with long reddish brown hairs; blade abaxially pale green, adaxially lustrous, green or deep green, broadly ovate or broadly elliptic, 3–7 × 2.5–5 cm, subleathery, abaxially sparsely adpressed pilose on veins or glabrous, adaxially sparsely or densely villous, long ciliate with purplish brown hairs on margins, palmately 5–7-veined, base truncate or rounded, margin lobed with ovate-deltoid or deltoid mucronulate teeth. Capitula 1.5–2 cm in diam., 1–7, rarely 9, arranged in terminal coryms, at first rather dense, becoming lax; peduncles 1–6 cm, slender, pubescent or subglabrous, with basal bract and several bracteoles; bracts and bracteoles linear or linear-spatulate, 5–10 mm. Involucres campanulate, 5–7 × 5–7 mm, not calyculate; phyllaries ca. 13, lanceolate or broadly lanceolate, 6–7 × 1–1.5 mm, herbaceous, inconspicuously 3-veined, puberulent, margin broadly scarios, apically acuminate or obtuse, ciliate at apex and on upper margin. Ray florets ca. 13, 9–13 mm; corolla tube 2.5–3 mm, glabrous; lamina yellow, oblong, 8–9 × 1.5–2 mm, 4-veined, apically 3-denticulate. Disk florets many; corolla yellow, ca. 4.5 mm with ca. 2 mm tube and campanulate limb; lobes ovate-lanceolate, ca. 1.5 mm, apically acute. Anthers oblong, ca. 1.5 mm, base obtuse to rounded, appendages lanceolate. Style branches recurved, ca. 0.8 mm. Achenes cylindric, ca. 1.8 mm, smooth, glabrous. Pappus white, 4–4.5 mm. Fl. Mar–Apr, fr. May. 2n = 48*.

- Riverbanks, waterfalls, rocky cliffs; 900–1000 m. Guizhou (Huanguoshu, Xingyi).

**Sinosenecio bodinieri** is very similar to **S. confervifer**, so much so that they may be treated as being conspecific. The former differs mainly by the leaf blade broadly ovate or broadly elliptic, base truncate or rounded, and margin long ciliate.

### 38. Sinosenecio confervifer (H. Léveillé) Y. Liu & Q. E. Yang, comb. nov.

**Basionym:** *Senecio confervifer* H. Léveillé, Fl. Kouy-Tchéou, 105. 1914–1915 ["conferviferus"; p. 104: "conferviferus"]; *S. bodinieri* Vaniot var. elatior Vaniot; *S. bodinieri* var. elatissimus Handel-Mazzetti; *Sinosenecio elatior* (Vaniot) B. Nordenstam; *S. elatissimus* (Handel-Mazzetti) B. Nordenstam.

Herbs, scapigerous. Rhizomes 5–10 mm in diam., clad in persistent brown petiole bases. Stems solitary, sometimes 2–5, erect, scapiform, 10–65 cm tall, villous with brown hairs, especially in lower part, usually 1 ovate or spatulate bract-like leaves in upper part. Radical leaves several, rosulate; petiole 2–7 cm, densely villous with long reddish brown hairs; blade abaxially pale green or purplish,
adaxially lustrous, green or deep green, orbicular or suborbicular, 1.5–6 × 2–6 cm, subleathery, abaxially sparsely villos or pubescent on veins, somewhat shortly ciliate with purplish brown hairs on margins, adaxially densely or sparsely villos or glabrous, palmately 5–7-veined, base cordate or subtruncate, margin repand or lobed, with rounded or broadly deltoid mucronulate or obscurely mucronulate shallow teeth or lobes. Capitula 1.5–2 cm in diam., 1–7(–10 or more), arranged in terminal corymbs, at first rather dense, becoming lax; peduncle 1–6 cm, slender, pubescent or subglabrous, with basal bract and 2 or 3 bracteoles; bracts and bracteoles linear or linear-spatulate, margin broadly scarious, apically acuminate or obtuse, 1–6 cm, slender, pubescent or subglabrous, with basal bract and bracteoles. Style branches recurved, ca. 0.8 mm. Achenes oblong, ca. 1.5 mm, base obtuse to rounded, appendages ovate, ca. 1.5 mm, apically acute. Ray florets: corolla yellow, ca. 4.5 mm, with 2–2.5 mm tube and campanulate limb; lobes ovate-lanceolate, ca. 1.5 mm, apically acute, pubescent. Disk florets many; corolla ca. 4 mm, tube ca. 3 mm, limb campanulate, lobes ovate-lanceolate. Anthers ca. 1.5 mm, base obtuse to rounded, appendages lanceolate. Style branches recurved, ca. 0.8 mm. Achenes cylindric, ca. 1.8 mm, smooth, glabrous. Pappus white, 4–4.5 mm. Fl. Apr–Jun, fr. May–Jul.

• Hillsides, streamssides, woods, shaded places; 500–2200 m. Chongqing, Guizhou, W Hunan, SE Sichuan, NE Yunnan.

Sinosenecio confervifer is very similar to S. bodinieri, distinguishable only by its leaf blade orbicular or suborbicular, base cordate or subtruncate, and margin shortly ciliate.


三脉蒲儿根 san mai pu er gen


Herbs, scapigorous. Rhizomes 3–4 mm in diam. Stems solitary, erect, purple, scapiform, 10–12 cm tall, simple, glabrescent, with several small spatulate, leaflike bracts in upper part. Leaves several, radical, long petiole; petiole 1–4 cm, base expanded, not auriculate; blade abaxially purple, adaxially dark green, orbicular or suborbicular in outline, 0.8–1.7 × 0.8–2 cm, subleathery, nitid, abaxially sparsely pubescent or glabrescent on midvein, adaxially pubescent, palmately veined, veins impressed adaxially, base shallowly coriaceous, shallowly regularly 5–7-lobed with broadly deltoid or rounded, entire, apiculate lobules, margin ciliate, apex acute. Capitula solitary, terminal; peduncules sparsely pubescent or glabrescent in upper part. Involucres campanulate, ca. 7 × 9 mm, ecalyculate; phyllaries 13, green at base, purple in upper part, oblong-lanceolate, ca. 6 × 1.5 mm, herbaceous, sparsely pubescent, apex fimbriate-ciliate and acuminate or acute. Ray florets 14 or 15; corolla tube ca. 1.5 mm, glabrous; lamina yellow, oblong-elliptic, 9 × 1.5 mm, 4-veined, apically 3-denticate. Disk florets many; corolla ca. 4 mm, tube ca. 3 mm, limb campanulate, lobes ovate-lanceolate. Anthers ca. 1.5 mm, base obtuse, appendages ovate-oblong. Style branches ca. 0.5 mm, apex truncate. Achenes cylindric, ca. 1 mm, smooth, glabrous. Pappus white, ca. 2.5 mm. Fl. May–Jun. fr. Jun. 2n = 144*.

• Streamsides, rocky cliffs under waterfalls; 1200–1700 m. Chongqing (Nanchuan).

Sinosenecio nanchuanicus resembles S. confervifer in posture and leaf shape but is distinguished by the leaf blade smaller, adaxially dark green, the veins impressed adaxially, and the capitula strictly solitary.


承经蒲儿根 cheng jing pu er gen

Herbs, scapigorous. Rhizomes short. Stems solitary, scapiform, erect, slender, ca. 32 cm tall, densely white tomentose at base, glabrous in middle and upper parts. Leaves 3, radical, long petiole; petiole ca. 3 cm, densely arachnoid-pubescent; blade orbicular, 5–7 × 5–7 cm, thinly papery, abaxially sparsely pubescent, adaxially pubescent, palmately 7–9-veined, base cordate, margin subentire, ciliate. Capitula many in corymbs; peduncles 2–3 cm, 1-bracteate at middle. Involucres campanulate, 3–5 × 3–4 mm, ecalyculate; phyllaries 10–13, lanceolate, ca. 4 × 1.5 mm, apex acute, glabrous. Ray florets yellow; corolla tube ca. 2 mm; lamina lanceolate, 5–6 × ca. 2 mm, apex acute. Disk florets many; corolla ca. 3 mm, limb campanulate or cupular. Achenes cylindric, ca. 2.5 mm, ribbed, glabrous. Pappus absent. Fl. Jun, fr. Jul.

**狗舌草属 gou she cao shu**

Chen Yilin (陈艺林 Chen Yi-ling); Bertil Nordenstam, Charles Jeffrey


Herbs, erect, perennial, rarely stoloniferous, rhizomatous, or rarely biennial or annual, with fibrous roots. Stems leafy, sometimes subscapiform, often arachnoid-tomentose at least when young. Leaves simple, petiolate or sessile, both radical and on stem. Radical leaves rosulate, persistent at or withered by anthesis; petiole winged or not winged, basally not auriculate; blade broadly ovate or deltoid to linear-spatulate, pinnately veined, base cordate to attenuate, margin coarsely sinuate-serrate or dentate to subentire. Capitula usually few to rather numerous, arranged in terminal, subumbelliform, simple or compound, corymbose cymes, rarely solitary, heterogamous and radiate, sometimes also homogamous and discoid, pedunculate. Involucres hemispheric, campanulate, or cylindric-campanulate, not calyculate, receptacle flat; phyllaries 18–25, rarely 13, uniseriate, linear-lanceolate or lanceolate, herbaceous, margin usually narrowly scarious or membranous. Ray florets 7–15, commonly 13, rarely 18 or 20–25; lamina yellow, orange, or purplish red, oblong, usually 3-denticulate. Disk florets many, corolla yellow, orange, or orange-red, sometimes purple tinged; limb funnelform or rarely campanulate; lobes 5. Anthers linear-oblong, rarely ob-ovate or deltoid to linear-spatulate, pinnately veined, base cordate to attenuate, margin coarsely sinuate-serrate or dentate to subentire. Achenes cylindric, ribbed, glabrous or sparsely to strongly pubescent. Pappus capillary-like, uniform, white, orange, or rarely rubescent, persistent, present in all florets.

About 50 species: temperate and arctic regions of Asia and Europe, and extending into North America; 14 species (four endemic) in China.

**Tephroseris** first appeared in the literature as the epithet of the name of a taxon of *Cineraria* Linnaeus of infrageneric, supraspecific rank (conventionally treated as sectional), validly published by Reichenbach in 1831: C. sect. *Tephroseris* Reichenbach (Fl. Germ. Excurs. 241. 1831). This taxon was later raised to generic rank by Reichenbach in 1841 as *Tephroseris* (Reichenbach) Reichenbach (Deut. Bot. Herb.-Buch (Nom.), 87. 1841). There, Reichenbach accepted three infrageneric, supraspecific taxa (conventionally treated as sections) within his genus, one of which was "3. *Pericallides*" [sic]. This refers to Candolle (Prodr. 6: 340. 1838), who treated "*Pericallis D. Don*" in synonymy under *Senecio* but treated the species of that affinity (loc. cit.: 409) under *S. “Ser. IX. Canarienses”* [a nomen nudum] [§] [i.e., unranked]. 1. *Pericallides* and nowhere there cited Don. However, within that taxon (loc. cit.: 410), Candolle included *S. tussilaginis* (L’Héritier) Lindley, the type (by monotypy, as *P. tussilaginis* (L’Héritier) D. Don) of the generic name *Pericallis* D. Don (in Swartz, Brit. Fl. Gard. 6: 228. 1838). Reichenbach, in citing "3. *Pericallis Dec.*" under *Tephroseris*, effectively transferred *S. [unranked] Pericallis Candolle to *Tephroseris*, as T. sect. *Pericallis* (Candolle) Reichenbach, and thereby implicitly included the type of *Pericallis D. Don* (1838) within *Tephroseris* (Reichenbach) Reichenbach (1841). The latter was therefore nomenclaturally superfluous when published (*Vienna Code*, Art. 52.1), but not illegitimate because it has a basionym (Art. 52.3). The following year, Reichenbach accepted *Tephroseris* (Reichenbach) Reichenbach in his Deutsche Bot. Fl. Sax. (146. 1842), and there (as in the present treatment) the generic name was correct because *Pericallis* was not included.

1a. Plants biennial or annual; pappus hairs conspicuously elongating at fruiting; ray lamina pale yellow ...................... 14. *T. palustris*

1b. Plants perennial; pappus hairs not conspicuously elongating at fruiting; ray lamina yellow, orange, or purplish red.

2a. Plants with long flagelliform stolons arising from base .............................................................................................. 1. *T. stolonifera*

2b. Plants without stolons.

3a. Achenes pubescent at least in part.

4a. Ray lamina yellow, 6–11 mm.

5a. Stem leaves and peduncles densely arachnoid and fulvous pubescent; radical leaves ovate or ovate-oblong, basally cordate or truncate; petioles not winged; achenes sparsely pubescent ...... 11. *T. phaeantha*

5b. Stem leaves and peduncles usually densely arachnoid-tomentose; radical leaves oblong or obovate-oblong, basally cuneate to attenuate; petioles winged; achenes densely hisrute ................ 12. *T. kirilowii*

4b. Ray lamina orange to purplish red, 15–20 mm.

6a. Radical leaves present at anthesis; phyllaries 20–22; ray lamina oblong .............................................................. 10. *T. rufo*

6b. Radical leaves withered by anthesis; phyllaries ca. 25; ray lamina linear .............................................................. 13. *T. flammea*

3b. Achenes glabrous.

7a. Ray lamina orange or dark purplish red; involucres dark purple or fuscous-purple.

8a. Stem 10–20 cm tall, densely glandular villous and multicellular hairy; ray lamina orange with purple streaks, ca. 15 mm; pappus white, ca. 5.5 mm ..................................................... 9. *T. turczaninovii*

- Woods. S Hunan (Jianghua).
8b. Stem to 60 cm tall, floccose-tomentose; ray lamina orange to dark purplish red, ca. 20 mm;
pappus rubescnt, 3.5–4 mm ................................................................. 10. _T. rufa_
7b. Ray lamina yellow; involucres green.
9a. Involucres 7–9 mm; stem floccose-tomentose or arachnoid-tomentose, or rarely glabrescent.
10a. Phyllaries densely fulvous glandular pubescent; ray lamina ca. 17 mm .................. 8. _T. adennelepis_
10b. Phyllaries 20–22, sparsely arachnoid or puberulent.
11a. Stem and leaves arachnoid; involucres 10–14 mm in diam.; ray florets 20–25,
lamina 7–8 mm ........................................................................ 6. _T. pierotii_
11b. Stem and leaves puberulent or subglabrous; involucres 6–8 mm in diam.; ray florets
13–15; lamina ca. 12 mm ................................................................. 7. _T. taitoensis_
9b. Involucres 4–6 mm; stem sparsely arachnoid or ± glabrous.
12a. Phyllaries 20–25, lanceolate, sparsely puberulent; ray lamina ca. 10 mm; stem leaves
basal1ly auriculate and subamplexicaul ........................................ 4. _T. pseudosonchus_
12b. Phyllaries 13–20, glabrous or hairy; ray lamina less than 8 mm; leaves basally not
auriculate.
13a. Leaf blades cordate-hastate; phyllaries 13; ray florets 7 .................... 5. _T. koreana_
13b. Leaf blades spatulate to ovate, not cordate; phyllaries 15–20; ray florets 13–20.
14a. Phyllaries 18–20, glabrous; ray lamina 6–7 mm; leaves spatulate,
linear-spataulate, or ob lanceolate, margin entire or submarginal .......... 2. _T. subdentata_
14b. Phyllaries 15 or 16, arachnoid; ray lamina 5–6 mm; leaves ovate, apically
obtuse to rounded, margin sparsely denticulate .......................... 3. _T. praticola_


蒲枝舌草 _pu zhi gou she cao_


Herbs, stoloniferous, rhizomatous. Stolons slender, flagelliform, with elongated internodes and very small leaves. Stem solitary, erect, leafy, 30–60(–80) cm tall, floccose-tomentose, ± glabrescent. Radical leaves several, rosulate, petiolate, usually present at anthesis; petiole 1.5–12 cm, rather broad, floccose-tomentose, fulvous hirtellous; blade adaxially green, broadly ovate or ovate-spatulate, 5–8 × 3–5 cm, papyraceous, abaxially arachnoid or floccose-tomentose, adaxially thinly arachnoid-tomentose and glabrescent, lateral veins 6, base broadly cuneate or subcordate and narrowly decurrent into petiole, margin subentire or remotely shallowly repand-dentate, apex obtuse to rounded, apiculate. Lower and median stem leaves similar but smaller, more shortly petiolate to subsessile, ovate to lanceolate, 3–6 × 0.5–1.5 cm. Upper leaves lanceolate to linear, sessile, bract-like. Capitula 2.5–3 cm in diam., 5–15 in terminal subumbelliform corymb or compound corymb; peduncles 1.5–3.5 cm, white arachnoid, fulvous hirtellous, with a basal subulate bract, not bracteolate. Involucres broadly campanulate, 7–8 × 5–7 mm, not calyculate; phyllaries ca. 20, linear-lanceolate, 1–1.5 mm wide, herbaceous, with submembranous margin, ± glabrous, apex acuminate and sparsely puberulent. Ray florets 11–13, corolla tube ca. 5 mm; lamina oblong, ca. 9 × 2–2.5 mm, 4-veined, apically 3-denticulate, obtuse. Disk florets numerous; corolla yellow, ca. 7 mm, with 4–5 mm tube and funnelform limb; lobes ovate-lanceolate, ca. 1 mm, apically acute, papillose. Anthers ca. 1.7 mm, basally obtuse to rounded, appendages ovate-lanceolate. Style branches ca. 0.5 mm. Achenes cylindric, 2.5–3 mm, glabrous. Pappus white, ca. 7 mm. Fl. Apr-Jun.

• Wet places, streamsides; 1400–2800 m. SW Sichuan, NW Yunnan.


尖枝狗舌草 _jian chi gou she cao_

_Cineraria subdentata_ Bunge, Enum. Pl. China Bor. 39. 1833; _C. pratensis_ Hoppe ex Reichenbach var. _borealis_ Herder; _Crepis chanetii_ H. Léveillé; _Senecio campestris_ (Retzius) Candolle var. _subdentatus_ (Bunge) Maximowicz; _S. imaii_ Nakai; _S. linearesoides_ Soldano; _S. pratensis_ (Hoppe ex Reichenbach) Candolle var. _polycaphalus_ Regel; _S. pseudosonchus_ Vaniot var. _borealis_ (Herder) S. Y. Hu; _S. pseudosonchus var. polycaphalus_ (Regel) Kitamura; _S. subdentatus_ (Bunge) Turczaninow (1837), not Ledebour (1833); _S. subdentatus var. borealis_ (Herder) Cufodontis; _S. subdentatus var. polycaphalus_ (Regel) Cufodontis; _Tephroseris polycaphala_ (Regel) Barkalov.

Herbs, rhizomatous. Stem solitary, erect, leafy, 20–60 cm tall, at first sparsely arachnoid, ± glabrescent. Radical leaves several, rosulate, usually present at anthesis, long petiolate; petiole 2–13 cm, narrowly winged, sparsely arachnoid, glabrescent, basally expanded; leaf blade spatulate, linear-spatulate, or obovate, 6–15(–22) × 1–2 cm, papyraceous, both surfaces sparsely arachnoid and glabrescent, pinnately veined, base gradually narrowed into petiole, margin entire, subentire, or irregularly mucronulate-dentate, apex obtuse to subacute. Lower stem leaves similar to radical leaves. Median leaves sessile, lanceolate to linear, 4–9 × 0.5–1 cm, smaller upward, margin entire or few toothed, apex acute or acute-acuminate. Upper leaves linear or linear-subulate, bract-like. Capitula 1.5–2 cm in diam., 7–30, arranged in terminal subumbelliform corymb or compound corymb; peduncles 1.5–3 cm, sparsely arachnoid and fulvous puberulent, basally bracteate; bracts linear-subulate, 7–8 mm, apically acuminate. Involucres campanulate, 4.5–5 × 4–5 mm, not calyculate; phyllaries 18–20, lanceolate or linear-lanceolate,
0.5–1 mm wide, herbaceous, with narrow membranous margin, glabrous, apex acuminate or long acuminate and green or somewhat purplish. Ray florets 13–15, corolla tube ca. 4 mm, glabrous; lamina yellow, oblong, 6–7 × 1.5–2 mm, 4-veined, apically 3-denticulate, obtuse. Disk florets many; corolla yellow, 6–7 mm with ca. 3.5 mm tube and funnelform limb; lobes oblong-lanceolate, ca. 1 mm, apically acute, papillose. Anthers ca. 1.5 mm, basally obtuse, appendages ovate-lanceolate. Style branches ca. 0.7 mm. Achenes cylindrical, ca. 2 mm, glabrous. Pappus white, 6–9 mm. Fl. Jun–Jul.

Wet meadows, damp places. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Qinghai [Korea, Russia (Far East, E Siberia)].

Probatova and Barkalov (in Kozhevnikov & Probatova, Fl. Ross. Dal’nego Vostoka, 253. 2006) elevated Senecio pratensis var. polyccephalus to the rank of species, i.e., Tephroseris polyccephala, which is doubtfully specifically distinct.


Tephroseris praticola

Herbs, rhizomatous. Stem solitary, erect, 20–40 cm tall, simple, green or purplish at base, glabrous or sparsely arachnoid. Radical leaves present at anthesis; petiole 3.5–4 cm, not winged or inconspicuously narrowly winged; blade ovate, 2–4.5 × 1–2 cm, both surfaces inconspicuously arachnoid or subglabrous, base narrowed into petiole, margin sparsely denticulate or subentire, apex obtuse to rounded. Lower stem leaves similar to basal leaves. Median stem leaves sessile, usually lanceolate, 3–4 × 0.3–0.5 cm, base subsessile or subsessile, margin entire or dentate, apex rather acute or obtuse. Upper leaves smaller, linear, apex acuminate or acute, base subacute. Capitula 2–12, arranged in terminal corymb; peduncules 1.5–2 cm, not bracteate, white arachnoid. Involucres hemispheric-campanulate, 5–8 × 5–7(–10) mm; phyllaries 15 or 16, herbaceous, linear-lanceolate, sparsely arachnoid or rarely subglabrous, apically acuminate. Ray florets 12–20, corolla yellow, tube 3–4 mm; lamina 5–6 × 1.5–2 mm, apically 3-denticulate. Disk florets numerous; corolla yellow, ca. 7 mm, with ca. 4 mm tube and funnelform limb; lobes lanceolate, ca. 1 mm. Anthers linear-oblong, basally obtuse. Style branches ca. 1 mm. Achenes cylindrical, 2–2.5 mm, glabrous. Pappus white, 7–7.5 mm. Fl. Apr–May.

● Streamsides, wet meadows; 300–400 m. Guizhou, Hebei, Hunan, Shaanxi, Shaxi.


Tephroseris koreana

Herbs, with leafy stems. Rhizomes 10–15 mm in diam., clad in persistent brown petiole bases. Stem solitary, erect, green or purplish, 30–60 cm tall, 3–4 mm in diam. at base, simple, sparsely arachnoid or pubescent, glabrescent. Radical leaves mostly withered at anthesis, long petiole; petiole 5–17 cm, slender, sparsely arachnoid or subglabrous, not winged, basally slightly expanded; blade abaxially pale green, adaxially green, deltoid or deltoid-cordate, 4–7 × 2.5–4 cm, abaxially sparsely arachnoid-tomentose, adaxially sparsely pubescent, base broadly cordate, margin coarsely dentate with deltoid mucronulate teeth, apex acute-acuminate. Lower and median stem leaves mostly withered by anthesis, several, rosulate, long petiolate; petiole 3–17 cm, winged, glabrescent, basally expanded; blade ovate-elliptic to oblanceolate, 6–15 × 2.5–4 cm, papery, both surfaces at first sparsely arachnoid, glabrescent, pinnately veined, lateral veins 10–12, base cuneately narrowed into petiole, margin reexpanded with mucronulate teeth, apex obtuse to rarely acute. Lower stem leaves similar to radical leaves. Median leaves sessile, oblong or oblong-lanceolate, 6–15 × 1–3 cm, smaller upward, base auriculate and amplexicaul, apex obtuse to acute. Upper leaves linear-lanceolate, bractlike. Capitula 2.5–3 cm in diam., 6–12 arranged in simple or compound subumbelliform terminal corymbs; peduncles 1.5–4.5 cm, sparsely pubescent, basally bracteate, not bracteolate, or with a linear-subsulate bract in upper part, slightly dilated at apex. Involucres broadly campanulate or hemispheric, 5–6 × 6–7 mm, not calyculate; phyllaries 20–25, lanceolate, ca. 1.5 mm wide, herbaceous, with membranous margin, sparsely pubescent or glabrous, apically acuminate. Ray florets 13–15, corolla tube ca. 4 mm, glabrous; lamina yellow, oblong, ca. 10 × 2.5–3 mm, 4-veined, apically obtuse, 3-denticulate. Disk florets many; corolla yellow, 7–7.5 mm, with 3.8–4 mm tube and campanulate limb; lobes ovate-triangular, ca. 1.2 mm, apically papillose. Anthers linear-oblong, ca. 2 mm, basally obtuse, appendages ovate-lanceolate; style branches ca. 0.5 mm. Achenes cylindrical, 2–2.5 mm, glabrous. Pappus white, 7–7.5 mm. Fl. Apr–May.

● Streamsides, wet meadows; 3000–3200 m. N Xinjiang (Altay) [Russia (Siberia)].
herbaceous, sparsely puberulent, margin scarious, apically acute to obtuse or shortly acuminate, and white ciliate. Ray florets ca. 7; corolla tube ca. 2.5 cm, glabrous; lamina oblong, ca. 8 × 2.5–3 mm, 4-veined, apically 3-denticulate, obtuse. Disk florets many; corolla yellow, 5.5–6 mm, with ca. 2.5 mm tube and campanulate limb; lobes oblong-lanceolate, ca. 1.5 mm, apically acute. Anthers oblong, ca. 1.7 mm, basally obtuse; appendages ovate-oblong. Style branches recurved. Achenes cylindric, 2–2.5 mm, glabrous, ribbed. Pappus white, ca. 5 mm. Fl. Jun, fr. Aug.

Wet forests. Jilin (Changbai Shan), Liaoning [Korea].

Until recently, Tephroseris koreana was treated in Sino senecio, but it was transferred to Tephroseris on the basis of molecular and other evidence (Nordenstam & Pelser, Compositae Newslett. 49: 5. 2011).

However, one of us (Jeffrey) does not accept the transfer of Sino senecio koreana to Tephroseris; i.e., phenetically, S. koreana is Sino senecio, not Tephroseris, as shown by the combination of leaf shape and venation, low phyllary and ray floret numbers, short ray floret and disk floret corolla tubes, and campanulate disk floret corolla limbs.


浙江舌草 zhe jiang gou she cao


Herbs, rhizomatous. Stem solitary, erect, 50–60 cm tall, rather stout, simple, arachnoid or ± glabrescent. Radical leaves usually present at anthesis, several, rosulate, long petiolate; petiole 4–10 cm, ± winged, at first arachnoid-tomentose, glabrescent, basally expanded; leaf blade oblong, narrowly oblong, or oblongate, 12–20 × 1.5–3 cm, papery, both surfaces at first arachnoid-tomentose, later ± glabrescent, pinnately veined, base cuneate or gradually narrowed into petiole, margin mucronulate-dentate or sometimes subentire, apex obtuse to subacute. Stem leaves rather numerous, sessile; lower leaves oblong to oblongate, base subamplexicaul; upper leaves gradually smaller upward, lanceolate to linear, base broadly subamplexicaul, apex acuminate; uppermost leaves bractlike, linear or linear-subulate, white arachnoid-tomentose, apex acute. Capitula 2.5–3 cm in diam., usually 6–30 arranged in subumbelliform or umbelliform corymb; peduncles to 5 cm, sparsely arachnoid or pubescent, basally bracteate, not bracteolate; bracts linear-subulate. Involucres hemispheric, 7–8.5 × 10–14 mm, not calyculate; phyllaries 20–22, broadly lanceolate, ca. 1 mm wide, herbaceous, with membranous margin, sparsely arachnoid or glabrescent, apex acute-acuminate. Ray florets 20–25; corolla tube 4–6 mm; lamina yellow, 7–8 mm, oblong, 4-veined, apically obtuse, 3-denticulate. Disk florets many; corolla yellow, 7–9 mm, with 5–6 mm tube and funneliform limb; lobes ovate-oblong, 1–1.2 mm, apically acute, papilllose. Anthers ca. 1.5 mm, basally obtuse. Style branches ca. 1 mm. Achenes cylindric, 2.5–3 mm, glabrous. Pappus white, 7–9 mm. Fl. Apr–May.

Marshes, wet places; 300–500 m. Fujian, Heilongjiang, Jiangsu, Liaoning, Zhejiang [Japan, Korea].


台东舌草 tai dong gou she cao


Herbs, rhizomatous. Stem solitary, erect, 30–60 cm tall, simple, sparsely arachnoid to subglabrous. Radical leaves few, usually present at anthesis, rosulate; petiole 3–6 cm, winged, basally expanded; blade ovate-oblong or broadly oblong, 9–15 × 4.5–6.5 cm, thinly papery, glabrous, base cuneate-attenuate into petiole, margin irregularly repand-dentate to subentire, apex obtuse to rounded, apiculate. Stem leaves few, progressively smaller upward; lower leaves shortly petiolate, oblong or oblongate-oblong, basally subamplexicaul; upper leaves sessile, ovate-lanceolate or lanceolate, margin few dentate or entire, apicately obtuse to subacute; uppermost leaves small, bractlike. Capitula 2.5–3 cm in diam., 8–12 arranged in terminal subumbelliform simple or compound corymb; peduncles 1.5–4 cm, slender, pubescent, basally bracteate, not bracteolate; bracts linear-subulate. Involucres campanulate, 6–7 × 6–8 mm, not calyculate; phyllaries 20–22, lanceolate or linear-lanceolate, 0.8–1 mm wide, herbaceous, with narrow membranous margin, glabrous, apex acuminate. Ray florets 13–15; corolla tube ca. 7 mm; lamina yellow, ca. 12 × 2.5 mm, 4-veined, apically 3-denticulate, obtuse. Disk florets: corolla yellow, 11–12 mm, with 8–8.5 mm tube and funnelliform limb; lobes ovate-oblong, ca. 1 mm, apically acute, papilllose. Anthers ca. 1.5 mm, basally obtuse, appendages ovate-lanceolate. Style branches ca. 0.5 mm. Achenes cylindric, 2–2.5 mm, glabrous. Pappus white, 10–11 mm. Fl. Mar–Apr.

● Marshes. Taiwan.


腺苞舌草 xian bao gou she cao

Herbs, rhizomatous. Stem solitary, erect, 40–50 cm tall, simple, rather densely white arachnoid-tomentose, glandular pubescent. Radical leaves several, usually present at anthesis, rosulate, long petiolate; petiole 2–7 cm, narrowly winged, arachnoid-tomentose, basally expanded; blade ovate-lanceolate or elliptic-lanceolate, 6–12 × 1.5–3 cm, papery, both surfaces white arachnoid-tomentose, base cuneate or attenuate into petiole, margin subentire or obscurely mucronulate-dentate, apex obtuse to rounded, mucronulate. Stem leaves few, progressively smaller upward. Lower leaves petiolate, oblongate-oblong or spatulate, 12–15 × 1.5–2.5 cm, attenuate into a broadly winged, basally subamplexicaul petiole; upper leaves small, linear-lanceolate or linear. Capitula 3–3.5 cm in diam., 3–8 arranged in terminal umbelliform corymb; peduncles 3–9 cm, rather stout, sparsely arachnoid, also brownish glandular hairy, with or without a small linear basal bract, not bracteolate. Involucres broadly campanulate, 8–9 × ca. 10 mm, not calyculate; phyllaries ca. 18, lanceolate, ca. 1.5 mm wide, herbaceous, with narrow membranous margin, densely glandular pu-
bescent with brownish hairs, apically acute-acuminate. Ray florets 13–15; corolla tube ca. 7 mm; lamina yellow, oblong, ca. 17 × 2.5 mm, 4-veined, apically 2–3-denticulate. Disk florets many; corolla yellow, ca. 8.5 mm, with ca. 5.5 mm tube and funnelform limb; lobes ovate-lanceolate, ca. 1 mm, apically acute, papilllose. Anthers ca. 1.7 mm, basally obtuse, appendages ovate-lanceolate. Style branches ca. 0.8 mm. Achenes cylindric, ca. 3 mm, glabrous. Pappus white, 7–7.5 mm. Fl. Jul–Aug.

Stony mountain slopes. Not recorded from China but expected in Heilongjiang, Jilin, and adjacent mountains [Russia (Far East)].

Probatova and Barkalov (in Kozhevenkov & Probatova, Fl. Ross. Dal’nego Vostoka, 254, 2006) considered that this may be a synonym of Tephroseris subscaposa (Komarov) Czerepanov (Vasc. Pl. Russia, 108. 1995).


Herbs, rhizomatous. Stem solitary, erect, green or purplish in lower part, 9–60 cm tall, white floccose-tomentose, often ± glabrescent. Radical leaves several, present at anthesis, rosulate, shortly petiolate; petiole 0.5–3 cm, broadly to narrowly winged, basally expanded; blade ovate, elliptic, or oblanceolate, 2–10 × 1.5–3 cm, papery, both surfaces at first sparsely arachnoid-tomentose, glabrescent, pinnately veined, base cuneate-attenuate into petiole, margin entire or remotely mucronulate-dentate, apex obtuse to rounded. Lower stem leaves oblong or oblong-spatulate; median leaves sessile, oblong or oblanceolate, 3–6 × 0.5–1 cm, progressively smaller upward, base expanded and subamplexicaul, apex obtuse; upper leaves linear-lanceolate to linear, both surfaces sparsely arachnoid and glabrescent to subglabrous, and sparsely to densely pilose, apex acute. Capitula radiate, less often discoid, 2–20 arranged in dense to lax terminal subumbelliform corymbs; peduncles 1–4.5 cm, densely to sparsely white arachnoid-tomentose, and pilose, linear-bracteate at base, bracteolate or not. Involucres campanulate, 6–7 × 7–10 mm, not calyculate; phyllaries 20–22, wholly fulvous-purple or purple only at apex, lanceolate to linear-lanceolate, 1–1.5 mm, herbaceous, densely to sparsely arachnoid and fulvous pilose to glabrescent, apically acute-acuminate. Ray florets ca. 15, corolla tube ca. 5 mm; lamina yellow, 4-veined, 3-denticulate. Disk florets many; corolla orange to orange-red or yellow with orange lobes, 7–8 mm, with 3.5–4 mm tube and funnelform limb; lobes ovate-lanceolate, ca. 1.2 mm, apically acute, papilllose. Anthers ca. 2.5 mm, basally obtuse, appendages ovate-lanceolate. Achenes cylindric, ca. 3 mm, glabrous or pubescent. Pappus somewhat pubescent, 3.5–4 mm. Fl. Jun–Aug.

- Montane meadows, slopes, roadsides; 2600–4000 m. Gansu, Hebei, Qinghai, Shaanxi, Shanxi, NW Sichuan, NE Xizang.
  1a. Achenes glabrous ............................................... 10a. var. rufa
  1b. Achenes pubescent ........................................ 10b. var. chaetocarpa

10a. Tephroseris rufa var. rufa

橙舌狗舌草(原变种) cheng she gou she cao (yuan bian zhong)


Achenes glabrous.

- Montane meadows; 2600–4000 m. SW Gansu, Hebei, SE Qinghai, Shaanxi, NW Sichuan, NE Xizang.


食べる舌狗舌草 mao guo cheng she gou she cao

Tephroseris flammea (Turczaninow ex Candolle) Holub var. chaetocarpa (C. Jeffrey & Y. L. Chen) Y. M. Yuan.

Achenes pubescent.

- Slopes, meadows, roadsides; 2800–3200 m. Gansu, Hebei, Qinghai, Shanxi.


长舌狗舌草 chang bai gou she cao
**Senecio phaeanthus** Nakai, Bot. Mag. (Tokyo) 31: 110. 1917; **S. bironbensi**us Kitamura; **S. fauriei** H. Léveillé (1910), not **S. fauriae** Franchet (1888); **S. integrifolius** (Linnaeus) Clairville subsp. fauriei Kitamura; **Tephrosiris birubonensis** (Kitamura) B. Nordenstam.

Herbs, rhizomatous. Stem solitary, erect, subscapiform, 13–45 cm tall, simple, sparsely arachnoid and pubescent, ± glabrescent after anthesis. Radical leaves few to several, present at anthesis, rosulate; petiole 2–6(–8) cm, densely arachnoid and pubescent, not winged, basally slightly expanded; blade ovate-oblong or elliptic, 6–13 × 2–4 cm, papery, both surfaces arachnoid and pubescent, somewhat glabrescent, pinnately veined, lateral veins 10–14, obscure, margin irregularly sinuately dentate or dentate with mucronulate teeth, apex rounded. Stem leaves few, progressively smaller upward; lower and median oblong, with winged petioles or sessile, lanceolate, sparsely arachnoid, glandular pubescent, margin subentire or mucronulate-serrate, apex obtuse to acute or acuminate. Capitula 1.5–2 cm in diam., 2–6(–8) arranged in terminal umbelliform corymbs; peduncles 1.5–2 cm, sparsely arachnoid, densely glandular with fulvous hairs, basally bracteate, not bracteolate. Involucres campanulate, 7–8 × 7–9 mm, not calyculate; phyllaries 18–20, lanceolate or linear-lanceolate, 1–1.5 mm wide, herbaceous, with narrow membranous margin, densely to sometimes sparsely arachnoid, sometimes ± glabrescent, apically acuminate or acute, and green or purplish. Ray florets 13–15; corolla tube 3–3.5 mm; lamina yellow, oblong, 6.5–7 × 2.5–3 mm, 4-veined, apically 3-denticate, obtuse. Disk florets many; corolla yellow, ca. 8 mm, with ca. 4 mm tube and funneliform limb; lobes ovate-lanceolate, ca. 1.2 mm, apically acute, papillose. Anthers ca. 2.2 mm, basally obtuse, appendages ovate-lanceolate. Style branches ca. 1 mm. Achenes cylindric, ca. 2.5 mm, densely hirsute. Pappus white, ca. 6 mm. Fl. Feb–Aug.

Grassy and stony slopes and meadows; 200–2000 m. Anhui, Fujian, Gansu, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Shanxi, Shandong, Shanxi, Sichuan, Taiwan, Zhejiang [Japan, Korea, Mongolia, Russia (Far East)].

Vibe (in Krasnoborov, Fl. Sibir. 13: 155–156. 1997) recorded *Tephrosis integrifolia* (Linnaeus) Holub for China; however, we have seen no specimens. *Tephrosis kirilowii* might prove not to be specifically distinct from *T. integrifolia*.


**红轮狗舌草**  hong lun gou she cao

*Senecio flammeus* Turczaninow ex Candolle, Prodr. 6: 362. 1838; **S. flammeus** var. **glabrifolius** Cufo dontis; **S. flammeus** f. limprichtii Cufodontis; **S. flammeus** f. simplex Y. Ling; **S. longelgulatus** H. Léveillé & Vaniot; **Tephrosis flammea** subsp. **glabrifolia** (Cufodontis) B. Nordenstam.

Herbs, rhizomatous, with leafy stems. Stem solitary, erect, to 60 cm tall, white arachnoid-tomentose and pubescent, ± glabrescent. Radical leaves withered by anthesis, long petiolate; blade elliptic-oblong, base cuneately narrowed, apex obtuse to acute. Lower stem leaves oblanceolate-oblong, 8–15 × 1.5–3 cm, thickly papery, both surfaces sparsely arachnoid-tomentose and pubescent or adaxially ± glabrescent and sometimes abaxially also, base cuneately narrowed into winged, subamplexicaul, slightly decurrent petiole, margin irregularly mucronate-dentate, apex obtuse to subacute, mucronulate. Median stem leaves sessile, elliptic, oblong, or oblong-lanceolate, apically acute to obtuse, mucronulate; upper leaves linear-lanceolate to linear, smaller. Capitula ca. 3 cm in diam., 2–9 arranged in ± umbelliform terminal corymbs; peduncles fulvous pubescent and usually white arachnoid-tomentose, basally bracteate, 2- or 3-bracteolate. Involucres campanulate, 5–6 × 6–10 mm, not calyculate; phyllaries ca. 25, lanceolate or linear-lanceolate, ca. 1 mm wide, herbaceous, dark purple, sparsely arachnoid or subglabrous, apex acute. Ray florets 13–15; corolla tube 3–3.5 mm; lamina dark orange, linear, 12–16 × ca. 1.6 mm, 4-veined, 3-denticate. Disk florets many; corolla yellow or purplish...
yellow, 6–6.5 mm, with ca. 3 mm tube and funnelform limb; lobes tinged purplish, ovate-lanceolate, ca. 1 mm, apically acute, papillose. Anthers ca. 2 mm, basally obtuse, appendages ovate-lanceolate. Achenes cylindric, 2.5–3 mm, pubescent. Pappus whitish, ca. 5.5 mm. Fl. Jul.–Aug.

Montane meadows, forests; 1200–2100 m. Hebei, Heilongjiang, Jilin, Nei Mongol, Shaanxi, Shanxi [Russia (Far East, E Siberia)].


Herbs, biennial or annual, with numerous fibrous roots. Stem solitary, erect, 20–60 cm tall, hollow, glandular pubescent at upper part, leafy. Radical leaves petiolate, withered by anthesis; lower stem leaves petiolate; median stem leaves sessile, oblong or oblong-lanceolate or lanceolate-linear, 5–15 × 0.7–1.8 cm, papery, both surfaces glandular pubescent, rarely glabrous, base subamplexicaul, margin coarsely sinuate-serrate to reandent-dentate or rarely entire, apex obtuse. Capitula radiate, few to many arranged in dense to lax terminal corymbs; peduncles densely glandular pubescent. Involucres campanulate, 5–7 × 5–7 mm, not calyculate; phyllaries 18–20, green, lanceolate, herbaceous, with membranous margin, sparsely glandular, apically acuminate. Ray florets 20–25; corolla tube 3–3.5 mm; lamina pale yellow, elliptic-oblong, ca. 5.5 × 2.5 mm, apically obtuse, 2- or 3-denticulate or entire. Disk florets many; corolla yellow, 2 mm, with ca. 2.5 mm tube and funnelform limb; lobes ovate-lanceolate, apically acute, papillose. Anthers ca. 1.2 mm, basally obtuse, appendages ovate-lanceolate. Achenes cylindric, ca. 2.5 mm, glabrous. Pappus copious, white, 3–3.5 mm at anthesis, 12–13 mm in fruit. Fl. Jun.–Aug.

Wet places; 600–1000 m. Hebei, Heilongjiang, Nei Mongol [circumboreal (except Greenland and most of NW Europe)].

105. NEMOSENECIO (Kitamura) B. Nordenstam, Opera Bot. 44: 45. 1978.

羽叶菊属 yu ye ju shu
Chen Yilin (陈艺林 Chen Yi-ling); Bertil Nordenstam, Charles Jeffrey


Herbs, perennial or biennial, erect, rhizomatous, with fibrous roots. Leaves alternate, herbaceous, green; basal and lower stem leaves usually fallen by anthesis; petiole unwinged; blade broadly ovate or ovate-oblong, pinnately veined, deeply pinnatifid into whitish, ca. 5.5 mm. Fl. Jun–Aug.

Six species: China, Japan; five species (all endemic) in China.

1a. Pappus absent from all florets ............................................................................................................................................. 5. N. concinnus

1b. Pappus present in all florets, at least when young.

2a. Phyllaries usually 6–8; achenes and ovary glabrous ............................................................................................................. 4. N. solenoides

2b. Phyllaries more than 10; achenes and ovary pubescent or apically sparsely setose.

3a. Capitula small; involucres 2–3 × 2–3 mm; ray lamina short, ca. 2 mm ................................................................................. 1. N. formosanus

3b. Capitula larger; involucres 4.5–7 × 3–8 mm; ray lamina 5–13 mm.

4a. Involucres 3–4 mm in diam.; leaves usually with 3 or 4(or 5) lateral lobes on each side; ray lamina 5–7 mm ........................................................................................................................................... 2. N. incisifolius

4b. Involucres 6–8 mm in diam.; leaves usually with 6 or 7 lateral lobes on each side; ray lamina 11–13 mm ............................................................................................................................................. 3. N. yunnanensis

1. Nemosencio formosanus (Kitamura) B. Nordenstam, Opera Bot. 44: 46. 1978.

台湾刘寄奴 tai wan liu ji nu


Plants biennial, stoloniferous; stems solitary, erect, green or purple, 9–60 cm tall, simple or branched above, ± pubescent with white crisped hairs. Basal leaves usually shed by anthesis; lower and median stem leaves petiolate; blade abaxially pale green, adaxially green, ovate-oblong, 2.5–15 × 1.5–6 cm, pinnatifid or subpinnatifid with 3–6 lateral lobes on each side, both surfaces puberulent; lateral lobes spreading,
ovate-oblong or oblong, usually 3–6-denticulate, apex acute to obtuse; upper stem leaves progressively smaller, shortly petiolate. Capitula few to many, pseudoumbellate, pedunculate, 8–10 mm across ray florets; peduncles 0.5–2.2 cm, slender, minutely puberulent, ebracteolate. Involucres cupuliform, 2–3 × 2–3 mm; phyllaries 13, uniseriate, narrowly oblong, 3–4 × ca. 1 mm, herbaceous, externally glabrous, margin hyaline, ciliate, apex acuminate. Ray florets ca. 13; corolla tube ca. 2.5 mm; lamina oblong, ca. 2 × 1 mm, 4-veined, apically 3-dentate. Disk florets many; corolla yellow, ca. 3.5 mm, with tube ca. 2.5 mm and campanulate limb; lobes 5, ovate-triangular, ca. 0.5 mm, apex acute. Anthers oblong, ca. 0.5 mm, obtuse to rounded at base. Style branches ca. 0.5 mm. Achenes narrowly ovate, apex acuminata. Capitula 6–14 in terminal or upper axillary subumbelliform corymbs; peduncles somewhat flexuous, 2–3 cm, slender, sparsely puberulent. Involucres broadly campanulate, 6–8 mm in diam.; phyllaries 10–13, subuniseriate or subbiseriate, ovate-lanceolate, 6–7 × 1.3–3 mm, herbaceous, externally puberulent, with thin margins and puberulent tips, faintly many veined, apex acute. Ray florets ca. 13; corolla tube 2–3 mm; lamina linear-ob lanceolate, 11–13 mm, (4–6)-veined, apically shortly 3-dentate. Disk florets many; corolla yellow, 4–4.5 mm, with tube 2–2.5 mm and campanulate limb; lobes 5, equal, ovate-triangular, ca. 1 mm, apex acute. Anthers ca. 1.3 mm, obtuse to rounded at base. Style branches 0.6–0.7 mm, dorsally minutely papillate. Achenes narrowly cylindrical, 1.5–1.8 mm, shortly pubescent especially in upper half, or subglabrous. Pappus persistent, 4–4.5 mm. Fl. Jul–Aug.

- Mountain slopes; 2300–2900 m. Taiwan (Gaoxiong).

羽叶菊


Stems solitary, erect or ± flexuous, 30–75 cm tall, sparsely puberulent or glabrous. Basal and lower stem leaves shed by anthesis; median stem leaves petiolate; blade ovate-oblong, 5–10 × 3–6 cm, rather thickly herbaceous, glabrous or abaxially sparsely white pilose on veins, pinnatifid with 3–5 lateral lobes on each side; lateral lobes subopposite or alternate, oblong, margin acutely coarsely (1–)3–5-dentate, apex acute or acuminate. Capitula (4–)15–30 in terminal subumbelliform corymbs, 1.5–2 cm across ray florets; peduncles 1.5–3(–4) cm, acuminate. Capitula (4–)15–30 in terminal subumbelliform corymbs, 1.5–2 cm across ray florets; peduncles 1.5–3(–4) cm, acuminate. Capitula 4–5 mm. Fl. Aug.

- Mixed woods; 2200–2800 m. Yunnan.


刺裂羽叶菊

Senecio yunnanensis (Jeffrey) B. Nordenstam, Opera Bot. 44: 46. 1978.

Stems solitary, erect, 50–70 cm tall, sparsely puberulent or glabrous. Basal and lower stem leaves shed by anthesis; median stem leaves petiolate; blade ovate-oblong, 5–10 × 3–6 cm, rather thickly herbaceous, glabrous or abaxially sparsely white pilose on veins, pinnatifid with 3–5 lateral lobes on each side; lateral lobes subopposite or alternate, oblong, margin acutely coarsely (1–)3–5-dentate, apex acute or acuminate. Ray florets 7 or 8; corolla tube ca. 2.7 mm; lamina linear-oblong, 5–7 × 1–1.5 mm, 4-veined, apically 3-dentate. Disk florets many; corolla yellow, 4–4.5 mm, with tube 2–2.5 mm and campanulate limb; lobes 5, equal, ovate-triangular, ca. 1 mm, apex acute. Anthers ca. 1.3 mm, obtuse to rounded at base. Style branches 0.6–0.7 mm, dorsally minutely papillate. Achenes narrowly cylindrical, 1.5–1.8 mm, shortly pubescent especially in upper half, or subglabrous. Pappus persistent, 4–4.5 mm. Fl. Jul–Aug.

- Grasslands, scrub; 1700–2800 m. W Guizhou, E Yunnan.


茄状羽叶菊

Senecio solenoides Dunn, J. Linn. Soc., Bot. 35: 508. 1903.

Stems erect, 50–90 cm tall, simple, glabrous. Lower leaves shed by anthesis; median stem leaves petiolate; petiole 3–4 cm, shorter in upper leaves, sparsely puberulent to subglabrous; blade broadly ovate, 6–12 × 3–12 cm, membranous, abaxially sparsely puberulent, axially minutely pubescent, deeply pinnatisect with 3 or 4 lateral lobes on each side; lateral lobes subopposite, oblong-lanceolate or lanceolate, apex acute or acuminate, coarsely and irregularly 3–5-dentate, teeth mucronate; terminal lobe subequalling lateral ones. Capitula 5–9 in terminal subumbelliform corymbs, 1.5–2 cm across ray florets; peduncles 0.8–1.8 cm, slender, sparsely glandular. Involucres campanulate, 5–6 × ca. 3 mm; phyllaries 6–8, subuniseriate, ovate-oblong, ca. 5 × 1.2–2 mm, herbaceous, externally minutely puberulent, with puberulent tips and pale brown scarios margins, apex obtuse or acuminate. Ray florets 5–9; corolla tube ca. 2.7 mm; lamina linear or oblong-linear, ca. 8 × 1–1.5 mm, 5-veined, apically shortly 2-dentate. Disk florets many; corolla yellow, 4–4.5 mm, with tube 2–2.5 mm and campanulate limb; lobes 5, equal, ovate-triangular, ca. 1.5 mm. Anthers 1–1.5 mm, obtuse to rounded at base. Style branches 0.7–0.8 mm. Achenes narrowly cylindrical, ca. 2 mm, glabrous. Pappus persistent, ca. 4 mm. Fl. Aug.–Nov.

- Mountains; ca. 1800 m. S Yunnan.


渦果羽叶菊

Senecio concinnus Franchet, J. Bot. (Morot) 10: 418. 1896.

Stems solitary, erect, 35–70 cm tall, slender, subglabrous. Basal leaves shed by anthesis; stem leaves petiolate; petiole 1–2 cm, slender, glabrous; blade ovate or ovate-oblong, 4–12 × 1.5–4.5 cm, membranous, abaxially sparsely puberulent, adaxially glabrous, deeply pinnatifid with 4–6 lobes on each side; lateral lobes obovate-oblong and 2- or 3-lobulate, or linear and...
entire, basally cuneate, apex mucronate; terminal lobe subequaling lateral ones. Capitula 1–3(–6), terminal, lax; peduncles 1–2 cm, slender, sparsely puberulent. Involucres depressed-campanulate, ca. 5 × 5–7 mm; phyllaries ca. 13, subuniseriate, oblong-lanceolate. 4–5 × ca. 1 mm, herbaceous, externally glabrous, with scarious margins and minutely puberulent or ciliate tips, 3–5-veined, apex acute or acuminate. Ray florets ca. 13; corolla tube ca. 1.5 mm; lamina pale yellow, linear-oblong or linear, 7–8.5 × 1.3–1.8 mm, 4-veined, apically shortly 3-dentate. Disk florets many; corolla yellow, 2.5–3 mm, with tube ca. 1 mm and campanulate limb; lobes 5, equal, ovate-triangular, ca. 0.8 mm. Anthers ca. 1 mm, obtuse to rounded at base. Style branches ca. 0.5 mm. Achenes (immature) narrowly cylindric, 1.5–1.7 mm, sparsely hispidulous. Pappus absent. Fl. Jul.

- Woods; ca. 1900 m. Chongqing (Chengkou).

### 3. Subtribe SENECTIONINAE

千里光亚族 qian li guang ya zu
Chen Yilin (陈艺林 Chen Yi-ling), Liu Ying (刘莹), Yang Qiner (杨亲二);
Bertil Nordenstam, Charles Jeffrey, Leszek Vincent

Antheropodia balusterform, with enlarged marginal basal cells; endothecial tissue with usually radial cell wall thickenings, rarely scattered; stigmatic areas usually discrete, rarely contiguous or confluent; gametic chromosome number usually 20 or 10, less often 52, 50, 30, 23, 22, 19, or 5.

About 100 genera and 2,500 species: worldwide (except Antarctica); nine genera (one endemic, three introduced) and 135 species (74 endemic, six introduced) in China.

1a. Anther bases with sterile caudate auricles.
   2a. Plants erect or subscandent, without prehensile petioles ................................................................. 106. Synotis
   2b. Plants scandent, with basally thickened, prehensile petioles ......................................................... 107. Cissampelopsis

1b. Anther bases without sterile caudate auricles, obtuse to sagittate.
   3a. Involucre not calculeate.
      4a. Capitula homogamous, discoid .................................................................................................. 112. Emilia
      4b. Capitula radiate.
         5a. Leaves cauline, palmately veined; ray lamina variously colored (never yellow) ...................... 113. Pericallis
         5b. Leaves rosulate, pinnately veined; ray lamina white ................................................................ 114. Hainanecio
   3b. Involucre calculeate.
      6a. Style branches erect, with long, subulate, papillose appendages .................................................. 111. Gymura
      6b. Style branches recurved, without papillose appendages.
         7a. Marginal female florets filiform ................................................................................................. 110. Erechites
         7b. Marginal female florets radiate or absent.
            8a. Apex of style branches without a central appendage of fused papillae .................................. 108. Senecio
            8b. Apex of style branches with a central appendage of fused papillae ........................................ 109. Crassocephalum


千里光属 he er ju shu
Chen Yilin (陈艺林 Chen Yi-ling); Bertil Nordenstam, Charles Jeffrey

Senecio subg. Synotis C. B. Clarke, Compos. Ind. 177. 1876.

Subshrubs or perennial herbs, rhizomatous, erect or sometimes scrambling or ± scandent. Rhizomes woody. Stems usually leafless in lower part at anthesis, leafy above or with leaves subsulate at base of synflorescence. Leaves simple, petiolate or sessile, broadly ovate-cordate to narrowly oblong-lanceolate, pinnately veined, rarely 3-veined from near base, base sometimes auriculate, margin usually not lobed, rarely deeply pinnately divided, usually mcrconulate-serrate or dentate. Capitula few to very numerous, arranged in terminal or axillary and narrow to broad and abundant thyrses, heterogamom and radiate or disciform, or homogamous and discoid, erect or ascending, pedunculate or sometimes subsessile. Involucres calculeate, campanulate or cylindric; receptacle flat; phyllaries (2–)4 or 5 or 7 or 8 or 11–15, free, herbaceous to leathery, margin scarios. Ray florets or filiform female florets absent or 1–10(–20); lamina yellow, conspicuous or inconspicuous, sometimes minute, (1–)4(–6)-veined, apically not or (1–)3(–5)-denticulate. Disk florets 1 to many; corolla yellow, sometimes pale yellow or cream; limb funnelform, lobes 5. Anthers linear-oblong or linear, usually distinctly caudate, tail 0.3–2 × as long as antheropodium, rarely subcaudate with tail only ca. 0.25 × as long as antheropodium; antheropodium balusterform to subcylindric, stout, basally hardly to rather distinctly dilated, with somewhat enlarged basal lateral cells; endothecial cell wall thickenings few to numerous, radial, cells usually short. Style branches truncate or convex, with short to long marginal papillae and often with a central tuft of sometimes longer papillae. Achenes cylindric, ribbed, glabrous or less often pubescent. Pappus capillary-like, uniform, white, straw-colored, or rubescent.
About 54 species: endemic to the Sino-Himalayan region, except for *Synotis atractylidifolia*, which occurs in N China; 43 species (30 endemic) in China.

The genus is divisible into two well-marked sections and five series, which are not described here.

1a. Plants with leaves subrosulate at base of synflorescence, herbaceous; lower part of stem when developed leafless; synflorescence terminal; leaves abaxially never white tomentose.

2a. Leaves basally cordate to rounded, abruptly narrowed into winged or not winged petiole.

3a. Ray florets 2–5, conspicuous; phyllaries 7 or 8.

4a. Ray florets 2, lamina ca. 2.5 mm; petioles broadly to narrowly winged

14. *S. ainsliaeifolia*

4b. Ray florets 4 or 5, lamina ca. 4 mm; petioles not winged

11. *S. pseudodulata*

3b. Ray florets absent to 2, minute; phyllaries 4 or 5.

5a. Petiole not winged; phyllaries ± glabrous

12. *S. wallachii*

5b. Petiole winged, rarely not; phyllaries setose

13. *S. alata*

2b. Leaves basally cuneate, gradually attenuate into winged or not winged petioles.

6a. Capitula discoid.

7a. Involucres 3–4 mm; phyllaries 10–12; pappus scant, 2–3 mm

8. *S. brevipappa*

7b. Involucres 6–7 mm; phyllaries 5; pappus abundant, 6–8 mm.

8a. Petioles narrowly winged to base; pappus pure white; calycular bracts to 6 mm

9. *S. sciatrephes*

8b. Petioles not winged to base; pappus off-white, sordid; calycular bracts not more than 3 mm

10. *S. rayongensis*

6b. Capitula radiate.

9a. Involucres 5–7 × 2–4 mm.

10a. Phyllaries 10–12; involucres 5–7 × 3–6 mm; ray lamina 9–10 mm

1. *S. cavaleriei*

10b. Phyllaries 8; involucres ca. 5 × 2–3 mm; ray lamina ca. 5 mm

2. *S. duclouxii*

9b. Involucres 10–11 × 5–6 mm.

11a. Ray lamina 6–11 mm; calycular bracts 4–6 mm.

12a. Phyllaries 13–15; leaves abaxially finely sparsely arachnoid-tomentose and glabrescent

4. *S. fulwipes*

12b. Phyllaries ca. 10; leaves abaxially very sparsely setulose or glabrous

6. *S. austroymmanensis*

11b. Ray lamina 3.5–5 mm; calycular bracts to 3 mm.

13a. Stems sparsely arachnoid-tomentose; leaves narrowly elliptic, apically caudate-accuminate, abaxially adpressed pilose; calycular bracts 10; phyllaries 12, basally sparsely arachnoid

7. *S. damiaoshanica*

13b. Stems densely fulvous tomentose; leaves obovate-spatulate or obovate-elliptic, apically obtuse or shortly acute, abaxially gray-white tomentose; calycular bracts 7 or 8; phyllaries 9–11, glabrous

5. *S. changiana*

1b. Plants with leaves ± equally distributed on stems, herbaceous, scandent or suffrutescent; synflorescences terminal and axillary; leaves abaxially sometimes white tomentose.

14a. Stems weak, flexuous; plants scandent or subscandent; capitula heterogamous.

15a. Involucres 4.5–5.5 × 1–1.5 mm; leaves ovate, basally cordate or cuneate

15. *S. tetrantha*

15b. Involucres 8–12 × 2–3 mm; leaves rounded at base

16. *S. yui*

14b. Stems ± erect; plants not scandent, ± erect; capitula heterogamous or homogamous.

16a. Capitula few, in terminal or axillary groups of 1–5; involucres 8–11 × 2.2–7 mm; leaves abaxially sparsely setose or thinly arachnoid, never densely white tomentose.

17a. Calycular bracts conspicuous, to 6 mm; leaves membranous

20. *S. chingiana*

17b. Calycular bracts inconspicuous, to 3 mm; leaves papery.

18a. Capitula discoid

19. *S. sinica*

18b. Capitula radiate.

19a. Ray florets 7, lamina 9–10 mm; leaves elliptic or oblanceolate-elliptic

17. *S. hieraciifolia*

19b. Ray florets 5, lamina ca. 3 mm; leaves oblanceolate-oblong

18. *S. guizhouensis*

16b. Capitula numerous, in flat-topped terminal corymb, rounded axillary terminal corymb, or large terminal thyres; involucres to 7 mm, if larger then leaves abaxially densely white tomentose.

20a. Synflorescences ± flat-topped terminal corymb.

21a. Leaves shortly petiolute, abaxially glabrous; pappus straw-colored.

22a. Phyllaries 3 or 4, ca. 7 mm; ray floret 1, minutely radiate

37. *S. acuminata*

22b. Phyllaries 5, ca. 5 mm; ray florets 2 or 3, conspicuously radiate

38. *S. calocephala*

21b. Leaves sessile, abaxially tomentose, or if glabrous then pappus white.

23a. Capitula radiate.

24a. Leaves abaxially thinly arachnoid-tomentose; pappus straw-colored; achenes glabrous; ray lamina 5–7 mm

41. *S. birmanica*
24b. Leaves abaxially glabrous; pappus white; achenes hairy; ray lamina 8–10 mm .......................................................... 43. *S. atractylidifolia*

23b. Capitula discoid.

25a. Stem leaves 2 or 3, long petiolate, blade reniform or cordate-reniform, margin undulate-dentate; capitula solitary, racemose; phyllaries and florets 5 ................................................................. 39. *S. reniformis*

25b. Stem leaves numerous, sessile or submersile, blade narrowly oblong-elliptic to lanceolate; capitula numerous, arranged in dense coryms; phyllaries 8; florets 8–11.

26a. Leaves abaxially thinly arachnoid-tomentose ........................................ 40. *S. lucorum*

26b. Leaves abaxially densely white tomentose ........................................ 42. *S. setchuenensis*

20b. Synflorescences ± rounded axillary and terminal coryms, or terminal pyramidal thyrses.

27a. Capitula arranged in terminal thyrses; florets 1–4 or 5, all bisexual.

28a. Leaves divided.

29a. Leaves deeply pinnatifid; lateral lobes (2 or)3 or 4 pairs, narrowly lanceolate or oblong-lanceolate ................................................................. 32. *S. vaniotii*

29b. Leaves 3–5-lobed or deeply palmatifid; lobes ovate-triangular or oblong-lanceolate.

30a. Leaves shallowly 3–5-lobed; involucres 6–7 mm; phyllaries and florets 5; achenes hairy ................................................................. 30. *S. muliensis*

30b. Leaves deeply 5-palmatifid; phyllaries and florets 3; achenes glabrous ................................................................. 31. *S. palmatisecta*

28b. Leaves undivided.

31a. Petiole expanded into an amplexicaul auricle, leaf blade triangular-ovate or triangular-hastate, both surfaces brown pubescent; phyllaries and florets 5; pappus purplish brown ................................................................. 26. *S. otophylla*

31b. Petiole not expanded, without an auricle, leaf blade ovate-lanceolate or oblong-lanceolate, rarely cordate, abaxially pubescent to subglabrous; phyllaries and florets 2 or 3 (or 4).

32a. Leaves cordate or ovate-cordate, subleathery, palmately veined, abaxially veins fulvous setulose; phyllaries and florets 3; pappus reddish ................................................................. 28. *S. cordifolia*

32b. Leaves not cordate, papery or thinly papery, pinnately veined, abaxially veins shortly pubescent or subglabrous; phyllaries and florets 2–4; pappus pale reddish brown or sordid.

33a. Synflorescences broad, lax pyramidal thyrses; phyllaries and florets 2 or 3; achenes glabrous or hairy; pappus pale reddish brown or straw-colored ................................................................. 29. *S. erythropappa*

33b. Synflorescences narrow, dense pyramidal thyrses; phyllaries 4 or 5; florets 3; achenes hairy; pappus white ................................................................. 27. *S. solidaginea*

27b. Capitula arranged in axillary and terminal coryms; florets 5–35, with at least 1 marginal filiform or radiate female floret present.

34a. Leaves abaxially white tomentose.

35a. Involucres 1.5–2 mm wide; florets 11–15.

36a. Lateral main veins of leaves with pale yellow-brown hairs .................. 21. *S. xantholeuca*

36b. Lateral main veins of leaves with conspicuous dark brown hairs ........ 22. *S. yakoensis*

35b. Involucres 2–4 mm wide; florets 19–35.

37a. Capitula disciform or minutely radiate ................................................ 25. *S. nagensium*

37b. Capitula conspicuously radiate.

38a. Synflorescences and phyllaries white arachnoid-tomentose, at most with some brown hairs intermixed; ray florets ca. 8 .................... 23. *S. cappa*

38b. Synflorescences and phyllaries conspicuously ferruginous tomentose; ray florets 14–20 ................................................................. 24. *S. ionodasys*

34b. Leaves abaxially not white tomentose.


40a. Leaves pubescent or thinly tomentose; ray lamina ca. 3.5 mm ............ 23. *S. cappa*

40b. Leaves glabrous; ray lamina ca. 6 mm ............................................. 3. *S. longipes*


41a. Coryms dense, glomeruliform, 2–4 cm ................................................ 33. *S. glomerata*


Herbs, erect, rhizomatous, vegetatively subcaulescent. Rhizome short, swollen, irregularly tuberous, woody. Vegetative stem short, to 5 cm, densely fulvous lanate, especially around leaf bases. Flowering stems solitary or few, scapiform, leafless, branching from base or in upper part, 5–42 cm tall, finely fulvous tomentose, ± glabrescent. Leaves basal, subrosulate or subsessile or shortly petiolate; petiole 0.5–1 cm, sparsely to densely pubescent; blade obovate to oblanceolate or sometimes subandurate, 4–20 × 2–8 cm, papery, abaxially sparsely finely arachnoid-pubescent, glabrescent and sometimes purpulose, adaxially sparsely setulose, pinnately veined, lateral veins 10–18, midvein prominent abaxially, base cuneate-attenuate, margin subentire to shallowly repand-dentate, apex sometimes shortly acuminous, obtuse. Capitula radiate, 1.5–2.5 cm in diam., few to numerous, arranged in abundant, long-stalked terminal or subterminal corymbs; peduncles 1.5–5 cm, slender, basally bracteate, shortly ± tomentose, with 3–6 linear or linear-lanceolate, 5–12 mm, thinly pubescent bracteoles. Involucres narrowly campanulate, 5–7 × 3–6 mm, calyculate; bracts of calyculus 3 or 4; phyllaries 8, oblong, ca. 1 mm wide, herbaceous, arachnoid-tomentose, ± glabrescent, margin broadly scarious, apically acute and puberulent. Ray florets 6–10; corolla tube ca. 4 mm, slender, glabrous; lamina yellow, oblanceolate, 6–7 × 1.5–2 mm, 4-veined, apically obtuse, 3-dentate. Disk florets ca. 8; corolla 8–9 mm, with ca. 3.5 mm tube and funnellike limb; lobes ovate-oblong, ca. 2.7 mm, apically acute. Anthers ca. 4 mm; anther tails ca. 1.3 × as long as antheropodium; appendages ovate-oblong; antheropodia slightly dilated at base. Style branches ca. 1.5 mm, fringed with fine papillae and with a distinct central tuft of long papillae. Achenes 1.8–2 mm, glabrous. Pappus white, ca. 7 mm. Fl. Nov.

- Rocky places, slopes, by streams and waterfalls; 1700–3000 m. Guizhou, Sichuan, Yunnan.


Senecio duclouxii Dunn, J. Linn. Soc., Bot. 35: 504. 1903; S. cichorifolia H. Léveillé.

Herbs, erect, rhizomatous, woody at base. Vegetative stem solitary, 20–40 cm tall, somewhat tomentose especially in lower part, ± glabrescent, leafless except at apex. Flowering stems several, scapiform, short, branching from base, 7–9 cm tall, fine arachnoid-pubescent, glabrescent. Leaves crowded in a rosette at base of synflorescence, shortly petiolate; petiole 0.5–2 cm, sparsely pubescent or glabrous; blade obovate-lanceolate or elliptic, 8–22 × 3–9 cm, papery, abaxially very thinly arachnoid at first and soon glabrous, abaxially glabrous, pinnately veined, lateral veins 18–20, arcuate-ascending, abaxially like midvein prominent, base cuneate, margin remotely shallowly to coarsely sinuate-denticulate especially in upper half, apex acuminate or acute. Capitula radiate, ca. 1 cm in diam., numerous, arranged in much branched corymbose clusters; peduncles 5–15 mm, basally bracteate, usually with 1 or 2 linear bracteoles, arachnoid-pubescent. Involucres narrowly campanulate, ca. 5 × 2–3 mm, calyculate; bracts of calyculus 3 or 4; phyllaries 8, oblong, ca. 1 mm wide, herbaceous, arachnoid-tomentose, ± glabrescent, margin broadly scarious, apically acute and puberulent. Ray florets 6–10; corolla tube ca. 4 mm, slender, glabrous; lamina yellow, oblanceolate, 6–7 × 1.5–2 mm, 4-veined, apically obtuse, 3-dentate. Disk florets ca. 8; corolla 8–9 mm, with ca. 3.5 mm tube and funnellike limb; lobes ovate-oblong, ca. 2.7 mm, apically acute. Anthers ca. 4 mm; anther tails ca. 1.3 × as long as antheropodium; appendages ovate-oblong; antheropodia slightly dilated at base. Style branches ca. 1.5 mm, fringed with fine papillae and with a distinct central tuft of long papillae. Achenes 1.8–2 mm, glabrous. Pappus white, ca. 7 mm. Fl. Nov.

- Mixed forests; 700–2500 m. Yunnan.


长柄合耳菊 chang bing he er ju

Herbs, basal parts unknown. Stems erect, ca. 60 cm tall, glabrous. Leaves on stem shortly petiolate; petiole 2–2.5 cm, narrowly winged, glabrous, somewhat expanded at base; blade oblong-lanceolate, 12–28 × 3.5–5.5 cm, finely papery, glabrous, pinnately veined, lateral veins 18–22, arcuate-ascending, base attenuate into petiole, margin coarsely sinuate-dentate, apex acute-acuminate. Uppermost leaves elliptic, smaller, margin mucronulate-serrulate, apex acute-acuminate. Capitula radiate, 1–1.5 cm in diam., numerous, arranged in abundant, long-stalked terminal and upper axillary compound corymbs; peduncles 6–10 mm, slender, sparsely arachnoid, bracteate at base, with a few minute subulate bracteoles. Involucres narrowly campanulate, 4–5 × 2–3 mm, calyculate; bracts of calyculus 2 or 3, subulate; phyllaries 8, oblong-lanceolate, 1–1.5 mm wide, herbaceous, sparsely arachnoid, margin broadly scarious, apex subacute and shortly barbellate. Ray florets 8; corolla tube ca. 3 mm; lamina yellow, oblanceolate, ca. 6 × 1.5 mm, 4-veined, apically obtuse, ob-

Herbs, erect, rhizomatous, vegetatively subacaulescent; rhizome short, woody, somewhat swollen. Vegetative stem short, to 10 cm, fulvous tomentose, densely so around leaf base. Flowering stem solitary, ascending-erect, scapiform, few branched, densely fulvous tomentose, 17–22 cm tall. Leaves subbasal, subsessile, obovate-lanceolate, 6–13 × 2–5.5 cm, papery or subleathery, abaxially scattered setulose, adaxially finely sparsely arachnoid-tomentose and glabrescent, pinnately veined, lateral veins 8–10, arcuate-ascending, base cuneate-attenuate, margin rather remotely and coarsely mucronately sinuate-serrate or repand-dentate, apex obtusely acuminate-mucronate. Flowering stem leaves few, small, obovate-lanceolate, or reduced to narrow bracts. Capitula radiate, 1.5–2 cm in diam., terminal in 2- or 3-headed clusters, shortly pedunculate. Involucres campanulate, 8–10 × 5–8 mm, tomentose at base, calyculate; bracts of calyculus 10–12, linear or linear-lanceolate, subequal, ca. 1/2 as long as phyllaries; phyllaries 13–15, oblong-linear, 1–2 mm wide, herbaceous, sparsely pubescent to glabrous, margin scarious, acutely to acute-acuminate and puberulent. Ray florets 6–10; corolla tube 5–6 mm; lamina yellow, elliptic-oblong, 6–11 × 2.5–2.7 mm, 4-veined, apically obtuse, 3-denticulate. Disk florets many; corolla yellow, 7–8 mm, with 2–3 mm tube and narrowly funnelform limb; lobes oblong-lanceolate, apically acute. Anthers linear, 3–4 mm, basally caudate, antheropodia distinctly dilated at base. Style branches excurved, apically obtuse, papillose. Anthers ca. 3 mm, anther tails ca. 0.8 × as long as antheropodium; appendages ovate-lanceolate, distinctly dilated at base. Style branches ca. 1.5 mm, fringed with obtuse papillae and with a longer central tuft. Achenes 1.5–2 mm, glabrous. Pappus dirty white, ca. 6 mm. Fl. Feb.

Roadsides. Yunnan (Zhaotong).


Herbs, erect, rhizomatous. Rhizome stout, ca. 2 cm in diam. Vegetative stem solitary, 40–50 cm tall, simple, 3–4 mm in diam. at base, lower part long noked, at first arachnoid, glabrescent, upper part fulvous tomentose. Leaves usually densely crowded at middle part, rosulate or subrosulate, shortly petiolate; petiole 1.5–2.5 cm, stout, densely tomentose; blade adaxially dark green, obovate-spatulate or elliptic-obovate, 8–14 × 4–7 cm, papery, abaxially gray-white arachnoid-tomentose, adaxially arachnoid, glabrescent, pinnately veined, lateral veins 14–18 pairs, arcuate-ascending, base broadly cuneate, margin irregularly mucronately sinuate-serrate, apex obtuse to subacute. Upper leaves sessile, bractlike, linear, small. Capitula radiate, usually 2–5 in terminal corymbs; synflorescence to 4 cm, densely fulvous tomentose, subsessile or shortly pedunculate, bracteate at base; bracts linear, 5–7 mm, acutely puberulent. Involucres campanulate, 8–10 × 10–12 mm, base fulvous tomentose, with 7 or 8 linear-subulate equal bracteoles; phyllaries 9–11, oblong-lanceolate, 8–10 × 2.5–3 mm, herbaceous, glabrous, with broadly scarious margin, inconspicuously 3-veined, acutely slightly acute or obtuse. Ray florets 5 or 6; corolla tube 3–3.5 mm, slender; lamina yellow, obovate, ca. 5 × 1–1.5 mm, 4- or 5-veined, apically 3-denticulate. Disk florets many; corolla yellow, 7–8 mm, with 2–3 mm tube and narrowly funnelform limb; lobes oblong-lanceolate, acutely acute. Anthers linear, 3–4 mm, basally caudate, antheropodia slightly expanded. Style branches excurved, apically obtuse, papillose. Achenes ca. 2 mm, glabrous. Pappus white, 7–8 mm. Fl. Oct–Nov.

Lax forests; 400–1000 m. Guangxi (Lingchuan, Yangshuo).


Herbs, erect, rhizomatous. Rhizome woody, branching. Vegetative stem solitary, 17–45 cm, sparsely fulvous villous, glabrescent, leafless except at apex. Flowering stem solitary, erect, scapiform, 10–25 cm tall, few branched, fulvous tomentose, glabrescent. Leaves crowded in a rosette at base of flowering stems, shortly petiolate; petiole 1.5–2 cm, stout, sparsely ferruginous pubescent; blade oblanceolate-elliptic or obovate, 7–17 × 2–5 cm, papery or subleathery, abaxially sparsely pilose to subglabrous and sometimes purple, adaxially very sparsely setulose or glabrous, pinnately veined, lateral veins 10–14, arcuate-ascending, inconspicuous, base cuneate-attenuate into petiole, margin remotely and often coarsely mucronately sinuate-serrate or repand-dentate, apex acute-acuminate and mucronate. Flowering stem leaves few, much smaller, elliptic or lanceolate; uppermost leaves narrow, bractlike. Capitula radiate, 2–7 in terminal corymbose clusters; peduncles 0.5–2.5 mm, densely fulvous villous, bracteate; with 2 or 3 linear or linear-lanceolate, 8–15 mm, acutely acute, sparsely villous bracteoles. Involucres narrowly campanulate, 8–11 × 5–7 mm, calyculate; bracts of calyculus 8–11, linear, 1/3–1/2 as long as phyllaries, glabrous or sparsely villous, acutely acute; phyllaries ca. 10, pale green, oblong-linear, 1.5–3 mm wide, herbaceous, glabrous, 3–5-veined, margin scarcely scarious, acutely acute, puberulent. Ray florets 6–9; corolla tube 6 mm; lamina yellow, elliptic-oblong, 8–10 × 2.5–3 mm, apically obtuse, 3-denticulate. Disk florets many; corolla yellow, 9–9.5 mm, with 3–5 mm tube and narrowly funnelform limb; lobes oblong-lanceolate, ca. 1.5 mm, acutely acute. Anthers ca. 4 mm, anther tails ca. 1.25 × as long as antheropodium; appendages ovate-lanceolate.
late, antheropodia stout, basally broadly dilated. Style branches ca. 2 mm, apically obtuse, fringed with long, rather fine papillae, central tuft only slightly longer than others. Achenes ca. 2 mm, glabrous. Pappus white, 8–9 mm. Fl. Oct–Nov.

- Mixed forests, thickets; 1000–1700 m. Guizhou, S Yunnan.


大苗山合耳菊 da miao shan he er ju

Herbs, erect, rhizomatous. Vegetative stem solitary, ca. 30 cm, thinly arachnoid-tomentose, glabresent, leafless except in upper part. Flowering stem solitary, erect, scapiform, ca. 13 cm tall, arachnoid-tomentose. Leaves rather crowded at base of flowering stems, shortly petiolate; petiole 3–5 cm, stout, densely pubescent; blade narrowly elliptic, 7–11 × 1–3 cm, papery, abaxially shortly scattered pilose, thinly pubescent on veins and purple, adaxially scattered pilose, pinnately veined, lateral veins 10–14, arcuate-ascending, base cuneate, margin rather distantly apiculate-serrate, apex caudate-acuminate. Flowering stem leaves few, small; upper leaves bractlike. Capitula radiate, 3 or 4 in terminal corymbose clusters; peduncles ca. 10 mm, densely arachnoid-tomentose, bracteate, with 1–3 linear-lanceolate bracteoles. Involucres subcylindric, 3–4 × 2–3 mm, calyculate; bracts of calyculus 4–6, linear, to 1/2 as long as phyllaries; phyllaries 10–12, oblong-lanceolate, ca. 1 mm wide, subleathery, margin narrowly scarious, subglabrescent, apically subacute or obtuse, puberulent and slightly spreading. Ray florets absent. Disk florets ca. 20; corolla pale yellow, ca. 7 mm, with ca. 2.7 mm tube and narrowly funnelform or tubular limb, much exserted from involucre, contracted at mouth; lobes erect, ovate-oblong, ca. 0.7 mm, apically acute, puberulent. Anthers ca. 3 mm, anther tails ca. 1.3 × as long as antheropodia; appendages ovate-oblong; antheropodia slightly dilated toward base. Style branches ca. 0.7 mm, fringed with long fine papillae; central tuft not markedly differentiated. Achenes ca. 1.5 mm, glabrous. Pappus 2–3 mm, shorter than corolla tube, setae few, easily deciduous. Fl. Aug.

- Open forests, dry slopes; 2400–2700 m. Xizang (Delei valley).


林荫合耳菊 lin yin he er ju


Herbs, erect, rhizomatous. Rhizome thick, woody, creeping, branching. Vegetative stem solitary, erect or ascending, 7–20 cm, glabrous, leafless except at apex. Flowering stem solitary, erect, scapiform, 20–50 cm tall, branching from near base or in upper part, arachnoid-tomentose, glabresent. Leaves crowded, subsessile at base of flowering stems, sessile; blade oblanceolate-oblong or elliptic, 12–22 × 4–6 cm, papery, both surfaces sparsely floccose-tomentose and glabrescent, pinnately veined, lateral veins 10–12, arcuate-ascending, base cuneate or attenuate into a 4–10 cm, gradually attenuate, winged petiole, slightly amplexicaul, margin remotely sparsely mucronately sinuate-serrate, apex acute-acuminate. Capitula discoid, numerous, arranged in rather dense orbicular 3–12-headed corymbs, terminal on usually rather short or strictly ascending synflorescence branches, whole forming a rather narrow paniculoid thyrse; peduncles short, ca. 2 mm, arachnoid-tomentose, bracteate, 1-bracteolate; bracts and bracteoles linear, to 10 mm, sparsely tomentose or subglabrous. Involucres cylindric, ca. 6 × 1.5–2 mm, calyculate; bracts of calyculus 3–5, linear, to 1/2 as long as phyllaries; phyllaries 5, oblong-linear, triangular-acuminate, herbaceous, glabrous, margin scarious, apically subobtuse, shortly barbellate and purplish. Ray florets absent. Disk florets 5 or 6; corolla yellow, ca. 8 mm, with ca. 5.5 mm tube and narrowly funnelform limb, exserted from involucre; lobes ovate-oblong, 1–1.2 mm, apically acute, exserted from involucre; lobes ovate-oblong, 1–1.2 mm, apically acute. Anthers ca. 2.5 mm, anther tails ca. 0.75 × as long as antheropodia; appendages ovate-lanceolate; antheropodia rather elongated, basally gradually dilated. Style branches ca. 1.5 mm, apically obtuse. Achenes 3.5–4 mm, glabrous. Pappus white, ca. 7.5 mm. Fl. Oct.

- Open forests; 1200–1500 m. Guangxi (Damiao Shan, Yuanbao Shan).


短缨合耳菊 duan ying he er ju

Herbs, erect, rhizomatous. Rhizome short, woody, branching. Vegetative stems 1 or 2, erect or ascending, ca. 50 cm or more, thinly arachnoid-tomentose, and shortly fuscous pubescent, glabresent, leafless except at apex. Flowering stem solitary, scapiform, few branched, thinly arachnoid, 10–40 cm tall, erect. Leaves crowded, subsessile at base of flowering stems, shortly petiolate; petiole 3–15 mm, arachnoid-tomentose; blade obturate-lanceolate or oblanceolate-elliptic, 12–25 × 3–8 cm, papery, abaxially thinly arachnoid especially on veins and glabresent, adaxially shortly scattered setulose, pinnately veined, lateral veins 18–22, arcuate-ascending, rather prominently reticulate abaxially, base cuneate or cuneate-attenuate, margin sharply antrorsely mucronate-serrate, apex acute-acuminate and attenuate. Stem leaves few, sessile, smaller. Capitula discoid, moderately numerous, arranged in orbicular terminal corymbs; peduncles 2–10 mm, fulvous tomentose, bracteate; bracteoles 1 or 2, linear. Involucres subcylindric, 3–4 × 2–3 mm, calyculate; bracts of calyculus 4–6, linear, to 1/2 as long as phyllaries; phyllaries 10–12, oblong-lanceolate, ca. 1 mm wide, subleathery, margin narrowly scarious, subglabrescent, apically subacute or obtuse, puberulent and slightly spreading. Ray florets absent. Disk florets ca. 20; corolla pale yellow, ca. 7 mm, with ca. 2.7 mm tube and narrowly funnelform or tubular limb, much exserted from involucre, contracted at mouth; lobes erect, ovate-oblong, ca. 0.7 mm, apically acute, puberulent. Anthers ca. 3 mm, anther tails ca. 1.3 × as long as antheropodia; appendages ovate-oblong; antheropodia slightly dilated toward base. Style branches ca. 0.7 mm, fringed with long fine papillae; central tuft not markedly differentiated. Achenes ca. 1.5 mm, glabrous. Pappus 2–3 mm, shorter than corolla tube, setae few, easily deciduous. Fl. Aug.

- Open forests, dry slopes; 2400–2700 m. Xizang (Delei valley).

Lin荫合耳菊 lin yin he er ju


Herbs, erect, rhizomatous. Rhizome thick, woody, creeping, branching. Vegetative stem solitary, erect or ascending, 7–20 cm, glabrous, leafless except at apex. Flowering stem solitary, erect, scapiform, 20–50 cm tall, branching from near base or in upper part, arachnoid-tomentose, glabresent. Leaves crowded, subsessile at base of flowering stems, sessile; blade oblong-lanceolate or elliptic, 12–22 × 4–6 cm, papery, both surfaces sparsely floccose-tomentose and glabrescent, pinnately veined, lateral veins 10–12, arcuate-ascending, base cuneate or attenuate into a 4–10 cm, gradually attenuate, winged petiole, slightly amplexicaul, margin remotely sparsely mucronately sinuate-serrate, apex acute-acuminate. Capitula discoid, numerous, arranged in rather dense orbicular 3–12-headed corymbs, terminal on usually rather short or strictly ascending synflorescence branches, whole forming a rather narrow paniculoid thyrse; peduncles short, ca. 2 mm, arachnoid-tomentose, bracteate, 1-bracteolate; bracts and bracteoles linear, to 10 mm, sparsely tomentose or subglabrous. Involucres cylindric, ca. 6 × 1.5–2 mm, calyculate; bracts of calyculus 3–5, linear, to 1/2 as long as phyllaries; phyllaries 5, oblong-linear, triangular-acuminate, herbaceous, glabrous, margin scarious, apically subobtuse, shortly barbellate and purplish. Ray florets absent. Disk florets 5 or 6; corolla yellow, ca. 8 mm, with ca. 3.5 mm tube and narrowly funnelform limb, exserted from involucre; lobes ovate-oblong, 1–1.2 mm, apically acute. Anthers ca. 2.5 mm; anther tails ca. 0.75 × as long as antheropodia; appendages ovate-lanceolate; antheropodia rather long, robust, basally distinctly dilated. Style branches ca. 1 mm, fringed with abundant, moderately long papillae, those of central tuft somewhat exceeding laterals. Achenes (immature) 1.7–2 mm, glabrous. Pappus white, ca. 5.5 mm. Fl. Oct–Dec.

- Open and shaded thickets; 2400–3000 m. Yunnan.


Herbs, erect, rhizomatous. Rhizome thick, woody, creeping. Vegetative stem solitary, erect, ca. 35 cm, sparsely pubescent, glabrescent to glabrous, leafless except at apex. Flowering stem solitary, erect, scapiform, 35–60 cm tall, shortly branching, thinly arachnoid-tomentose, glabrescent. Leaves crowded, subrotundulate at base of flowering stems; petiole 1–2.5 cm, not winged, slightly expanded at base; blade oblanceolate-ovate, 10–20 × 3–6 cm, membranous, abaxially sparsely arachnoid, glabrescent to glabrous, adaxially scattered setulose, pinnately veined, lateral veins 10–14, arcuate-ascending, base cuneate-attenuate into petiole, margin shallowly sinuate-paniculate or repand-paniculate, apex subacute-acute and puberulent. Flowering stem leaves few, remote, much smaller. Capitula discoid, numerous, arranged in rather dense 3–7-headed corymbs, terminal on short synflorescence branches, whole forming a somewhat attenuate narrowly paniculoid thyrs; peduncles 3–5 mm, densely fulvous tomentose; phyllaries 5, narrowly oblong, 1–1.5 mm wide, densely villous with purplish hairs, margin broadly carinate, apically obtuse to acute and puberulent, purple. Corolla tube 4–5 mm, lamina deep yellow, oblong, 4 × 1.5 mm, 3-dentate. Disk florets 10 or 11; corolla orange, ca. 8 mm, with ca. 3 mm tube and funnelform limb; lobes ovate-triangular, ca. 1 mm, apically acute, papillose. Anthers ca. 3 mm; anther tails ca. 0.75 × as long as antheropodia; appendages ovate-triangular; antheropodia stout, basally dilated. Style branches ca. 1 mm, fringed with moderately long papillae, central tuft longer, prominent. Achenes ca. 1.3 mm, glabrous. Pappus white, ca. 6.5 mm. Fl. Oct.

Cliff ledges, rocky slopes; ca. 2700 m. NW Yunnan [Myanmar].


Herbs, subcaulescent, rhizomatous. Rhizome short, thick, woody. Vegetative stem erect or ascending, subterranean, 0.5–20 cm, leafless except at apex. Flowering stems 1–4, erect, scapiform, to 40 cm tall, slender, thinly arachnoid, glabrescent. Leaves subrotundulate at base of flowering stems, long petiolate; petiole 3.5–8 cm, slender, slightly expanded at base, densely to sparsely fulvous pubescent; blade broadly ovate or ovate, 3.5–13 × 2.5–11 cm, membranous, abaxially sparsely pubescent especially on veins to glabrous, adaxially sparsely scattered setulose, pinnately veined, lateral veins 8, arcuate-ascending, margin remotely, obscurely to coarsely sinuate-dentate with mucronulate teeth, apex shortly rather broadly acuminate. Capitula heterogamous, disciform or minutely radiate, few to numerous, arranged in rather dense compound thyrsoid corymbs; peduncles short, 2–5 mm, pubescent, 1- or 2-bracteolate; bracts 3–6, linear. Involucres cylindric, 6–8 × ca. 1.5 mm, calyculate; bracts of calyculus few, short; phyllaries 5, oblong, ca. 1 mm wide, herbaceous, glabrous, sparsely arachnoid, or rarely sparsely to densely setulose, margin narrowly carinate, apically obtuse to acute and puberulent. Female florets 2; corolla tube 7–7.5 mm, filiform and 5-dentate or with minute inconspicuous apically 2-dentate lamina. Bisexual florets 3; corolla yellow, ca. 8 mm, with ca. 3.5 mm tube and funnelform limb; lobes ovate-triangular, ca. 1 mm, apically acute. Anthers ca. 3 mm; anther tails just exceeding antheropodia; appendages oblong-ovate; antheropodia rather short and broad, basally slightly dilated. Style branches ca. 1.5 mm, fringed with long papillae; terminal tuft not clearly differentiated. Achenes ca. 2.2 mm, glabrous. Pappus white, ca. 7 mm. Fl. Sep.

Mixed forests; ca. 2700 m. Xizang (Yadong) [Bhutan, India (Sikkim), Nepal].


Herbs, subcaulescent, rhizomatous. Rhizome thick, subtuberosous, woody. Vegetative stem erect, subterranean part rooting at nodes, densely tomentose, leafless except at apex. Flowering stem solitary, arising from basal rosette, erect, scapiform, ca. 50 cm tall, ferrugineous tomentose, somewhat glabrescent. Leaves in basal rosette, long petiolate; petiole 5–7 cm, not winged, densely ferruginous lanate; blade abaxially purple, ovate-oblong, 10–20 × 4–10 cm, papery, abaxially finely scattered villous, adaxially finely setulose, pinnately veined, lateral veins 10–14, arcuate-ascending, base cordate, margin shallowly repand-paniculate, apex shortly acute-acuminate. Flowering stem leaves few, sessile, lanceolate, bractlike. Capitula radiate, numerous, arranged in a rather slender compound thyrs terminating flowering stem; peduncles 2–3 mm, densely ferruginous tomentose, bracteate, few bracteolate; bracts and bracteoles linear, small. Involucres cylindric, 7–8 × ca. 3 mm, calyculate; bracts of calyculus 3–5, purplish, subulate, small; phyllaries 7 or 8, oblong, 1–1.5 mm wide, densely villous with purplish hairs, margin broadly carinate, apically obtuse to acute and puberulent, purple. Ray florets 4 or 5; corolla tube ca. 4.5 mm; lamina deep yellow, oblong, ca. 4 × 1.5 mm, 3-dentate. Disk florets 10 or 11; corolla orange, ca. 8 mm, with ca. 3 mm tube and funnelform limb; lobes ovate-triangular, ca. 1 mm, apically acute, papillose. Anthers ca. 3 mm; anther tails ca. 0.75 × as long as antheropodia; appendages ovate-triangular; antheropodia stout, basally dilated. Style branches ca. 1 mm, fringed with moderately long papillae, central tuft longer, prominent. Achenes ca. 1.3 mm, glabrous. Pappus white, ca. 6.5 mm. Fl. Oct.

Senecio alatus Wallich ex Candolle, Prodr. 6: 368. 1838.

Herbs, subcaulescent, rhizomatous. Rhizome thick, subterranean, 0.5–20 cm, leafless except at apex. Flowering stems 1–4, erect, scapiform, to 40 cm tall, slender, thinly arachnoid, glabrescent. Leaves subrotundulate at base of flowering stems, long petiolate; petiole 3.5–8 cm, slender, not winged, densely to sparsely fulvous pubescent; blade broadly ovate or ovate, 3.5–13 × 2.5–11 cm, membranous, abaxially sparsely pubescent especially on veins to glabrous, adaxially sparsely scattered setulose, pinnately veined, lateral veins 8, arcuate-ascending, margin remotely, obscurely to coarsely sinuate-dentate with mucronulate teeth, apex shortly rather broadly acuminate. Capitula heterogamous, disciform or minutely radiate, few to numerous, arranged in rather dense compound thyrsoid corymbs; peduncles short, 2–5 mm, pubescent, 1- or 2-bracteolate; bracts 3–6, linear. Involucres cylindric, 6–8 × ca. 1.5 mm, calyculate; bracts of calyx few, short; phyllaries 5, oblong, ca. 1 mm wide, herbaceous, glabrous, sparsely arachnoid, or rarely sparsely to densely setulose, margin narrowly carinate, apically obtuse to acute and puberulent. Female florets 2; corolla tube 7–7.5 mm, filiform and 5-dentate or with minute inconspicuous apically 2-dentate lamina. Bisexual florets 3; corolla yellow, ca. 8 mm, with ca. 3.5 mm tube and funnelform limb; lobes ovate-triangular, ca. 1 mm, apically acute. Anthers ca. 3 mm; anther tails just exceeding antheropodia; appendages oblong-ovate; antheropodia rather short and broad, basally slightly dilated. Style branches ca. 1.5 mm, fringed with long papillae; terminal tuft not clearly differentiated. Achenes ca. 2.2 mm, glabrous. Pappus white, ca. 7 mm. Fl. Sep.

Mixed forests; ca. 2700 m. Xizang (Yadong) [Bhutan, India (Sikkim), Nepal].


Senecio cymatocephalus var. oligocephalus Y. L. Chen & K. Y. Pan; S. cymatocephalus Diels.
Herbs, rhizomatous. Rhizome thick, woody, branching. Vegetative stems creeping, ascending, or erect, 30–50 cm, leafless in lower part, leafy in upper part or at apex only, fulvous tomentose or villous. Flowering stems solitary, erect, ± subscapiform, 20–60 cm tall, tomentose or villous. Leaves at base of flowering stems petiolate, subroseulate or somewhat distant; petiole 5–10 cm, broadly to narrowly winged, at least toward base, obscurely to distinctly auriculate; auricle subamplexicaul, sparsely dentate or entire; blade broadly ovate to lanceolate, 9–22 × 4.5–12 cm, membranous, abaxially pubescent or shortly villous especially on veins, adaxially sparsely to densely finely setulose, pinnately veined, lateral veins 10–12, arcuate-ascending, base cordate, truncate, or broadly cuneate, margin obscurely sinuate and minutely mucronulate-denticulate to distinctly mucronulate-serrate or coarsely and irregularly mucronulate-dentate, apically acut-e-acute-acuminate. Flowering stem leaves usually few, smaller, sessile, ovate-oblong or elliptic to oblanceolate-oblong or lanceolate-lanceolat e-oblong; upper leaves often apically attenuate, basally subamplexicaul. Capitula heterogamous, disciform, or minutely radiate, rather few to very numerous, arranged in narrowly to broadly pyramidal thyrsoid corymbs or branched thyrsoid panicles; peduncles 1–3 mm, densely setose or tomentose, minutely bracteate, 1- or 2-bracteolate. Involucres cylindric, 5–7 × ca. 1.5 mm, very shortly calyculate; bracts of calyculus few; phyllaries 4 or 5, oblong-linear, 0.5–1 mm wide, herbaceous, usually densely setulose, margin narrowly scarious, apically obtuse. Ray florets 2; corolla 2–3.5 mm, truncate or minutely radiate, shorter than style. Disk florets 2 or 3 (or 4); corolla yellow, 7–7.5 mm, with 2.5–3 mm tube and funnelform limb; lobes ovate-oblong, 1–1.2 mm, apically acute. Anthers ca. 3 mm; anther tails 0.3–0.75 × as long as antheropodia; appendages ovate-oblong; antheropodia somewhat elongated, stout, bilaterally dilated. Style branches ca. 1 mm, fringed with rather short papillae and with a rather short and scant terminal tuft. Achenes ca. 1.5 mm, puberulent or glabrous. Pappus white, 5–6 mm. Fl. Aug–Nov.

Forests, thickets; 1900–4000 m. Guizhou, Xizang, Yunnan [Bhutan, NE India, Myanmar, Nepal].


宽翅合耳菊 kuan chi he er ju

Herbs, probably rhizomatous, 30–200 cm tall; basal part not seen. Vegetative stems densely brown villous. Flowering stems solitary, erect, subscapiform, densely ferruginous pubescent. Leaves mostly subroseulate at base of flowering stems; petiole 4–9 cm, broadly to narrowly winged, base expanded and subamplexicaul, adaxially densely brown villous on midvein; blade ovate or ovate-oblong, 15–26 × 8–14 cm, papery, abaxially pubescent or shortly brownish villous especially on veins, adaxially hirtellous, pinnately veined, lateral veins 8–10, arcuate-ascending, base subtruncate or cordate, margin irregularly dentate or dentate-lacerate with mucronulate teeth, apex acuminate. Flowering stem leaves few, rapidly diminishing in size upward, shortly petiolate or sessile, ovate to lanceolate. Capitula heterogamous, minutely radiate, numerous, arranged in narrow to spreading paniculiod thyrses; peduncles 1–2 mm, densely pubescent, 1- or 2-bracteolate; bracts and bracteoles small. Involucres cylindric, 5–6 × 2–2.5 mm, very shortly calyculate; bracts of calyculus few; phyllaries 8, linear-lanceolate, 1–1.5 mm, herbaceous, densely setulose, margin broadly scarious, densely setulose, apically obtuse or acute. Ray florets 2; corolla yellow, 5–5.5 mm; corolla tube ca. 3 mm; lamina oblong-elliptic, ca. 2.5 × 1 mm, 4-veined, obscurely 3-denticulate. Disk florets 8 or 9; corolla dull yellow, ca. 7 mm, with ca. 3 mm tube and funnelform limb; lobes ovate-lanceolate, 1–1.2 mm, apically acute, papillose. Anthers ca. 2 mm, anther tails slightly exceeding antheropodia, appendages lanceolate; antheropodium somewhat elongated, rather stout, bilaterally dilated. Style branches ca. 0.7 mm, fringed with moderately long papillae, terminal tuft lax, slightly longer than lateral ones. Achenes (immature) ca. 1.5 mm, glabrous. Pappus white, 5–6 mm. Fl. Sep.

Open places in forests; ca. 2700 m. Xizang (Delei valley).


四花合耳菊 si hua he er ju

Senecio tetrantha Candolle, Prodr. 6: 370. 1838.

Herbs, scandent. Stems terete, sparsely pubescent or subglabrous, branching, leafy. Leaves rather distant, petiolate; blade ovate or ovate-lanceolate, 5.5–12 × 3.5–9 cm, membranous, abaxially sparsely pubescent especially on veins to glabrous, adaxially scattered setulose, pinnately veined, lateral veins 10, arcuate-ascending, base cordate, truncate, or rounded, margin mucronately irregularly sinuate-serrate or dentate, apex acutely long acuminate. Capitula heterogamous, minutely radiate, numerous, arranged in terminal and axillary paniculoid thyrses, shortly pedunculate or subsessile; peduncles densely pubescent, linear-bracteate. Involucres narrowly cylindric, 4.5–5.5 × 1–1.5 mm, shortly calyculate; bracts of calyculus few; phyllaries 4 or 5, oblong, herbaceous, sparsely pubescent, margin scarious, apically obtuse. Ray florets 2; corolla yellow, ca. 5 mm, with ca. 2.5 mm tube and oblong-linear, minutely 3-denticulate lamina, usually shorter than style. Disk florets 2 (or 3); corolla yellow, long exserted, ca. 7.5 mm, with ca. 2.5 mm tube and funnelform limb, lobes erect, oblong-lanceolate, ca. 1.5 mm, apically acute. Anthers ca. 2 mm, anther tails ca. equaling antheropodia; appendages ovate-lanceolate; antheropodium distinctly dilated at base. Style branches ca. 0.8 mm, fringed with rather short papillae. Achenes ca. 2.5 mm, sparsely puberulent. Pappus white or pale reddish, ca. 5 mm. Fl. Aug–Sep.

Mixed woods, forests; 2300–2700 m. Xizang (Cona, Nyalam) [Bhutan, NE India, Nepal].


蔓生合耳菊 man sheng he er ju

Herbs, rhizomatous. Rhizome woody, creeping. Stem solitary, subsucndent, flexuous, 35–45 cm, slender, pubescent with brownish multicellular hairs, glabrescent, leafy. Leaves shortly petiolate; petiole 0.5–0.8 cm, ± pubescent; blade abaxially purple, adaxially deep green, ovate or ovate-lanceolate, 4–10 × 1.5–2.5 cm, papery, abaxially sparsely pubescent on veins to
glabrous, adaxially scattered setulose to glabrous, triplinerved from base, base rounded, ± falcate in upper part, margin remotely sinuate-denticulate to rather distantly coarsely serrate with mucronate teeth, apex acuminate or caudate-acuminate; uppermost leaves similar but smaller and narrower. Capitula heterogamous, disciform, in lax terminal and upper axillary 3–7–headed corymbs; peduncles 6–18 mm, slender,linear-bracteate at base, with 1 or 2 linear bracteoles in upper part, sparsely slightly fulvous pubescent. Involucres cylindric, 8–12 × 2–3 mm, obscurely calylcate; bracts of calyculus 1–3, unequal; phyllaries 5, oblong-linear, 1–1.5 mm wide, herbaceous, glabrous, 3-veined, margin narrowly scarious, apically obtuse and pubescent. Marginal female florets 2; corolla yellow, ca. 5 mm, filiform, not radiate, shorter than style. Disk florets 3 or 4; corolla yellow, ca. 13 mm, with ca. 4 mm tube and narrowly funnelform limb; lobes oblong-lanceolate, ca. 1.5 mm, apically acute, puberulent. Anthers long exerted, ca. 5 mm, anther tails 0.5–0.75 × as long as antheropodia; appendages ovate-oblong; antheropodia long, stout, basally distinctly dilated. Style branches ca. 2 mm, fringed with stout papillae, terminal tuft much longer than lateral ones. Achenes ca. 3.5 mm, glabrous. Pappus white, ca. 9 mm. Fl. and fr. Aug–Sep.

Moss forests; 2700–2900 m. Xizang (Médog), Yunnan [Myanmar].


毛叶合耳菊 mao ye he er ju


Herbs, perennial; basal part not seen. Stems glabrous, leafy. Leaves shortly petiolate; petiole 1–2.5 cm, sparsely fulvous arachnoid, glabrescent to glabrous; blade elliptic or ob lanceolate-elliptic, 8–12 × 1.5–4 cm, thickly papery, abaxi ally sparsely fulvous arachnoid, adaxially glabrous, pinnately veined, lateral veins 10–14, inconspicuous, base cuneate, margin remotely mucronate-serrate, apex acuminate; uppermost leaves similar but smaller. Capitula radiate in lax few-headed terminal and upper axillary corymbs or thyrses; peduncles 1.5–3 cm, slender, sparsely to densely fulvous tomentose, glabrescent. Achenes ca. 3 mm, glabrous. Pappus white, ca. 9–10 mm. Fl. Feb–Mar.

- Riversides, forest margins, on rocks; 800–2200 m. Guizhou (Guanling), Yunnan (Wenshan).


黔合耳菊 qian he er ju

Herbs, rizhomatous. Rhizome woody, to 5 mm in diam., erect or ascending. Stem solitary, erect, ca. 130 cm tall, leafless in lower part, rather densely leafy above, simple, white arachnoid, glabrescent. Leaves shortly petiolate; petiole ca. 1 cm, fulvous pubescent and thinly arachnoid; blade oblanceolate-oblong, 8–15 × 1.5–2.5 cm, papery, abaxially thinly arachnoid, adaxially white arachnoid on midvein, pinnately veined, lateral veins 14–18, base attenuate, margin remotely shallowly to coarsely sinuate-dentate, with mucronulate teeth, apex acute or acute-acuminate. Upper leaves smaller; uppermost leaves sessile, linear, bractlike, 12–20 × 1–3 mm. Capitula radiate, solitary in axis of bractlike uppermost leaves, forming a narrow terminal raceme; peduncles 8–10 mm, densely arachnoid-tomentose; bracteoles 4 or 5, 3–5 mm. Involucres tubular, 6–7 × 2–3 cm, calylcate; bracts of calyculus 3 or 4, subulate, short; phyllaries 8–10, oblong, 1–1.5 mm wide, triangular-spreading, apically obtuse, and densely puberulent, subleafly, thinly arachnoid, margin broadly scarious. Ray florets 5; corolla tube ca. 7 mm; lamina yellow, oblong, ca. 3 × 1–1.5 mm, 6-veined, 4-denticulate. Disk florets 18 or 19; corolla ca. 10 mm, with ca. 2.5 mm tube and funnelform limb; lobes oblong-lanceolate, apically acute, papillose. Anthers ca. 4.5 mm; antheropodia stout, basally somewhat dilated; appendages ovate-lanceolate; anther tails ca. 2 × as long as antheropodia. Style branches ca. 2 mm, fringed with papillae, terminal tuft not evidently longer than laterals. Achenes ca. 3 mm, glabrous. Pappus pale straw-colored, ca. 11 mm. Fl. Sep.

- Montane forests; ca. 1600 m. Guizhou.


华合耳菊 hua he er ju


Herbs, rizhomatous. Stem solitary, erect, 50–80 cm tall, leafless in lower part, rather densely leafy above, simple or branching in synflorescence only, fulvous arachnoid, glabrescent. Leaves shortly petiolate; petiole 0.5–1.5 cm, densely fulvous pubescent; upper leaves subsessile or sessile, gradually smaller; leaf blade narrowly oblanceolate-elliptic or ob lanceolate, 10–16 × 2–3 cm, papery, abaxially sparsely slightly setulose and sometimes purplish, adaxially thinly fulvous arachnoid on midvein, pinnately veined, lateral veins 10–14, base attenuate, margin rather remotely shallowly sinuate-dentate with mucronulate teeth, apex acute-acuminate. Capitula discoid, not very numerous, arranged in narrow terminal thyrses, solitary in axis of upper leaves in lower part of synflorescence, in small axillary and terminal corymbs toward apex of synflorescence; peduncles 5–10 mm, bracteate, densely fulvous arachnoid, with 3 or 4 linear-subulate bracteoles. Involucres cylindric or nar-
rowly campanulate, 7–9 × 2–3 mm, calyculate; bracts of calyculus 3–5, short; phyllaries 8, linear-lanceolate, 1.5–2 mm wide, herbaceous, sparsely to densely arachnoid, margin narrowly scarious, apically obtusely triangular-acuminate and puberulent, somewhat spreading. Ray florets absent. Disk florets ca. 14 or 15; corolla yellow, ca. 10 mm, with ca. 3 mm tube and funnelform limb; lobes oblong-lanceolate, ca. 1.7 mm, apically acute. Anthers 4 or 5; anther tails equaling antheropodia; appendages ovate-oblanceolat; antheropodia rather short and broad, basally slightly dilated. Style branches ca. 1.8 mm, fringed with long papillae, terminal tuft not longer than laterals. Achenes 3–4 mm, glabrous. Pappus white, 7–9 mm. Fl. Jul–Sep.

- Montane forests; 1300–2200 m. Chongqing (Nanchuan), Guizhou.


子农合耳菊  zi nong he er ju

Herbs, rhizomatous. Rhizome thick, woody. Stem solitary, erect, to 80 cm tall, leafless in lower part, leafy above, branching in synflorescence, fulvous arachnoid-tomentose, glabrescent. Leaf petiole 1–3 cm, arachnoid-tomentose; leaf blade elliptic-oblong or oblong-lanceolate, to 22 × 6 mm, membranous, abaxially thinly floccose-arachnoid-tomentose and ± glabrescent, adaxially green and sparsely shortly setulose, pinately veined, lateral veins 16–20, arcuate-asceding and intramarginally uning, base cuneate, margin minutely mucronulate-dentate, apex acute-acuminate. Upper leaves and leaves of branches shortly petiolate, oblong-lanceolate, smaller. Capitula disciform, moderately numerous, arranged in lax 2–7-flowered terminal and upper axillary thyrsoid coryms; peduncles 1.5–2.5 cm, fulvous tomentose, basally bracteate; bracts of calyculus 3–5, linear, 5–7 mm, sparsely pubescent, apically acuminate. Involucres cylindric-campanulate, 10–12 × 4–5 mm, prominently calyculate; bracts of calyculus 10–12, linear, ca. 1/3 as long as phyllaries, phyllaries 8 or 9, oblong-lanceolate, 1.5–1.5 mm wide, herbaceous, sparsely pubescent or subglabrous, obscurely 3–5-veined, margin broadly scarious, apically acute, puberulent and purplush. Female florets 6; corollas filiform, ca. 9 mm, with ca. 3.5 mm tube and subcylindric, 5-denticulate limb. Disk florets 19 or 20; corolla 10 mm, with ca. 4 mm tube and funnelform limb; lobes ovate-oblong, ca. 1.5 mm, apically acute. Anthers ca. 3 mm; anther tails ca. equaling antheropodia; appendages ovate-lanceolate; antheropodia long, robust, basally distinctly dilated. Style branches ca. 1.5 mm, fringed with rather short papillae, terminal tuft distinct, ca. equaling laterals. Achenes ca. 3 mm, glabrous. Pappus white, ca. 10 mm. Fl. and fr. Oct.

- Broad-leaved and mixed forests; ca. 3000 m. NW Yunnan (Yangbi).


黄白合耳菊  huang bai he er ju


Herbs, rhizomatous. Rhizome thick, woody. Stem solitary, erect, 70–150 cm tall, leafless in lower part, leafy above, branching in synflorescence, densely white tomentose, subglabrescent. Leaf petiole 1–3.5 cm, stout, densely white tomentose and brownish setulose; blade ovate-lanceolate or lanceolate, to 23 × 7.5 cm, membranous, abaxially densely white tomentose, adaxially minutely fulvous pubescent especially on veins and sometimes at first also thinly floccose-tomentoso, pinately veined, lateral veins 16–24, arcuate-asceding and intramarginally uniting, base rounded to obtuse, margin rather closely to remotely apiculate-dentate, apex long acuminate, apiculate. Upper leaves and leaves of branches shortly petiolate, gradually smaller. Capitula minutely radiate, rather numerous, arranged in rounded 2–13-headed rather dense to lax axillary and terminal coryms; peduncles 0.5–2 cm, densely tomentose, basally bracteate, with a few linear or linear-filiform 4–8 mm bracteoles. Involucres cylindric-campanulate, 6–8 × 2.5–3.5 mm, calyculate; bracts of calyculus 3 or 4, purplish, linear, to 1/2 as long as phyllaries; phyllaries 5 or 8, oblong-lanceolate, 1.5–1.5 mm wide, herbaceous, sparsely arachnoid-tomentose, margin broadly scarious, apically acute to subobtuse-acuminate, puberulent and usually purplish. Ray florets 5; corolla tube ca. 4 mm; lamina yellow, ovate-oblong, small, usually shorter than style, apically 3-denticulate. Disk florets 5–10; corolla yellow, 9–10 mm, with ca. 3 mm tube and narrowly funnelform limb; lobes lanceolate, ca. 1 mm, apically acute. Anthers ca. 2.5 mm; anther tails exceeding antheropodia; appendages lanceolate; antheropodia slightly dilated at base. Style branches ca. 0.7 mm, fringed with rather short papillae, apical tuft distinct, much longer than laterals. Achenes ca. 2.5 mm, glabrous. Pappus white, 9–10 mm. Fl. and fr. Sep–Dec.

- Mixed forests, wet places; 2200–2700 m. NW Yunnan.


丫口合耳菊  ya kou he er ju


Herbs, robust, somewhat shrubby. Stems erect, ca. 90 cm tall, branching in synflorescence, densely white tomentose, setulose with reddish brown multicellular hairs. Leaf petiole 1–1.5 cm, densely white tomentose and brown setulose; blade lanceolate or elliptic-lanceolate, 7–16 × 4–5.5 cm, papery, abaxially densely white tomentose and ferruginous setuliferous especially on veins, adaxially shortly fulvous pubescent especially on veins, pinately veined, lateral veins 18–20, arcuate-asceding and intramarginally uniting, base rounded, margin apiculate-dentate, apically acuminate-attenuate or acuminate. Upper leaves and leaves of branches shortly petiolate, lanceolate or narrowly lanceolate, gradually smaller, apically attenuate. Capitula minutely radiate, numerous, arranged in globose, rather dense, axillary and terminal coryms; peduncles 5–10 mm, densely tomentose and brownish setulose, basally bracteate, with a few linear, densely tomentose bracteoles. Involucres cylindric, 6–7 × 2–2.5 mm, calyculate; bracts of calyculus 4 or 5, to 1/2 as long as phyllaries; phyllaries 5, oblong-linear, ca. 1
mm wide, herbaceous, thinly arachnoid-tomentose, margin narrowly scarious, apically obtuse or obtuse-acuminate, puberulent and dark colored. Ray florets 4; corolla tube ca. 4 mm; lamina yellow, ca. 3.5 mm, usually shorter than style, 3-denticulate. Disk florets 7–9; corolla yellow, ca. 8 mm, with ca. 3.5 mm tube and funnelform limb; lobes obvate-triangular, ca. 1 mm, acipitally acute, puberulent. Anthers ca. 2.5 mm; anther tails ca. 0.3 × as long as antheropodia; appendages ovate-lanceolate; antheropodia slightly dilated at base. Style branches ca. 1 mm, fringed with short papillae, terminal tuft distinct but hardly longer than laterals. Achenes ca. 5 mm, glabrous. Pappus white, ca. 7 mm. Fl. Oct–Nov.

- Open montane slopes and forests; ca. 2000 m. NW Yunnan.


密花合耳菊 mi hua he er ju

Senecio cappa Buchanan-Hamilton ex D. Don, Prodr. Fl. Nepal. 179. 1825; S. densiflorus Wallich ex Candolle; S. densiflorus var. lobii J. D. Hooker; S. nagensium C. B. Clarke var. lobii (J. D. Hooker) Craib; S. tsoongianus Y. Ling.

Subshrubs or shrubby herbs, rhizomatous. Stems erect, to 150 cm tall, often flexuous, densely lanate or arachnoid-tomentose, ± glabrescent when old, simple or usually branching above in synflorescences, leafless in lower part at anthesis. Leaves petiolate or sometimes subsessile; petiole to 10 mm, stout, densely tomentose, base often auriculate; blade broadly to narrowly obovate-oblancoceolate or oblong-elliptic, 10–28 × 4–8 cm, papery, abaxially densely to sparsely pubescent on veins and densely to sparsely whitish tomentose, sometimes ± glabrescent, axially shortly densely to sparsely pubescent and sometimes thinly white arachnoid to subglabrous, pinnately veined, lateral veins 12–28, arcuate-ascending, base attenuate, margin finely to coarsely mcruminate-serrate, acipitally acuminate. Upper leaves and leaves of branches lanceolate or linear-lanceolate, gradually smaller. Capitula radiate, usually numerous, arranged in terminal and axillary usually 10–20-headed dense compound corymbs or thyrses; peduncles 5–10 mm, densely tomentose, with a few linear or linear-subulate bracts. Involucres narrowly campanulate, 5–7 × 2–4 mm, calyculate; bracts of calyculus ca. 8, linear-lanceolate, 3–5 mm, acipitally acuminate; phyllaries 8–13, linear-lanceolate, ca. 1 mm wide, herbaceous, densely tomentose, margin narrowly scarious, acipitally obtuse to acute and puberulent. Ray florets ca. 8; corolla tube ca. 3.5 mm; lamina yellow, oblong, ca. 6 × 1.5 mm, 4- or 5-veined, 3-denticulate. Disk florets ca. 12; corolla yellow, ca. 7 mm, with ca. 3 mm tube and narrowly funnelform limb; lobes ovate-oblong, ca. 1 mm, acipitally acute. Anthers ca. 3 mm; anther tails ca. 1.5 × as long as antheropodia; appendages lanceolate; antheropodia elongated, basally dilated. Style branches ca. 1 mm, fringed with short papillae, terminal tuft barely differentiated. Achenes ca. 1.5 mm, glabrous or sparsely pubescent. Pappus white, ca. 6.5 mm. Fl. Feb–Oct.

- Forests, streambeds; 1200–2500 m. S Yunnan.


锯叶合耳菊 ju ye he er ju

Senecio nagensium C. B. Clarke, J. Linn. Soc., Bot. 25: 39. 1889; Inula vernoniiformis H. Léveillé; Pulicaria kouyangensis Vaniot; S. densiflorus Wallich ex Candolle var. fargesii (Franchet) Handel-Mazzetti; S. densiflorus var. mishmiensis J. D. Hooker; S. hugonis S. Moore; S. prionophyllus Franchet; Vernonia fargesii Franchet.

Subshrubs or herbs, rhizomatous. Stem erect, to 150 cm tall, densely whitish tomentose or fulvous tomentose, branching in synflorescence, leafless in lower part at anthesis. Leaves shortly petiolate; petiole 5–25 mm, densely tomentose and often also setulose with reddish brown hairs; blade adaxially green, obovate-elliptic, oblancoceolate-elliptic, or elliptic, 7–23 × 2.5–8.5 cm, papery, abaxially densely whitish tomentose or fulvous tomentose and brownish setulose especially on veins, adaxially sparsely arachnoid-tomentose and shortly scattered pubescent, pinnately veined, lateral veins 20–26–30, arcuate-ascending, prominent adaxially, base cuneate or cuneate-attenuate, margin narrow thinly arachnoid-tomentose, and sparsely scattered setulose especially on veins, pinnately veined, lateral veins 14–22, arcuate-ascending, furcate distally and excurrent in teeth, prominent abaxially, base cuneate-attenuate, margin sharply apiculate-serrate, apex shortly acuminate. Upper leaves shortly petiolate, gradually smaller. Capitula radiate, numerous, arranged in axillary and terminal compound corymbs; peduncles 5–15 mm, fulvous tomentose and purplish setulose. Involucres campanulate, 7–8 × 4–6 mm, calyculate; bracts of calyculus several, unequal, longest equaling phyllaries; phyllaries ca. 13, linear-lanceolate, ca. 1 mm wide, herbaceous, densely fulvous tomentose and often also purplish setulose, margin narrowly scarious, acipitally acute. Ray florets 14–20; corolla tube ca. 3.5 mm; lamina yellow, oblong, ca. 6 × 1.5 mm, 4- or 5-veined, 3-denticulate. Disk florets ca. 12; corolla yellow, ca. 7 mm, with ca. 3 mm tube and narrowly funnelform limb; lobes ovate-oblong, ca. 1 mm, acipitally acute. Anthers ca. 3 mm; anther tails ca. 1.5 × as long as antheropodia; appendages lanceolate; antheropodia elongated, basally dilated. Style branches ca. 1 mm, fringed with short papillae, terminal tuft barely differentiated. Achenes ca. 1.5 mm, glabrous or sparsely pubescent. Pappus white, ca. 6.5 mm. Fl. Feb–Oct.

- Forests, streamside; 1200–2500 m. S Yunnan.
finely to coarsely mucronulate-serrate or biserrate, apex shortly acuminate; upper and branch leaves smaller, shortly petiolate, narrowly elliptic or lanceolate. Capitula heterogamous, disciform or minutely radiate, numerous, arranged in narrow, simple, to spreading, compound, terminal and upper axillary paniculoid thyrses; peduncles 5–12 mm, densely tomentose and sometimes also ferruginous setulose, linear-bracteate. Involucres obconic-campanulate, 7–8 × 4–6 mm, calyculate; bracts of calyculus ca. 8, usually linear, equalizing phyllaries, sometimes leaves leaflike and much exceeding phyllaries; phyllaries 13–15, linear, 1–1.5 mm wide, herbaceous, very densely tomentose, margin narrowly scarious, apically acute. Female florets 12 or 13; corolla yellow, filiform, or minutely radiate, ca. 6 mm, minutely 3-dentate. Disk florets 12–20; corolla yellow, ca. 6 mm, with ca. 3 mm tube and funnelform limb; lobes ovate-lanceolate, ca. 1.5 mm, apically acute. Anthers ca. 3 mm; anther mm, with ca. 3 mm tube and funnelform limb; lobes ovate-lanceolate, ca. 1.5 mm, apically acute. Anthers ca. 3 mm; anther tails ca. 0.75–2 × as long as antheropodia; appendages ovate-oblong; antheropodia rather long and narrow, basally hardly dilated. Style branches ca. 1.5 mm, fringed with short papillae, terminal tuft indistinct. Achenes ca. 1.7 mm, sparsely pubescent. Pappus white, ca. 5 mm. Fl. Aug–Mar.

Woods, thickets, meadows; 100–2000 m. Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Sichuan, Xizang, Yunnan [NE India, N Myanmar, N Thailand].  


耳柄合耳菊 er bing he er ju 

Herbs, rhizomatous. Rhizome woody, creeping. Stems 1–3, erect, 30–70 cm tall, simple or few branched in upper part, densely to sparsely arachnoid and ± glabrescent, leafless in lower part at anthesis. Leaves rather crowded; petiole 0.5–2 cm, sparsely arachnoid; blade ovate-lanceolate, lanceolate, or elliptic-oblong, 6–12 × 2–4.5 cm, papery, both surfaces at first sparsely arachnoid, glabrescent, pinnately veined, lateral veins (6–)8–10, arcuate, strongly ascending, prominent abaxially, base cuneate to rounded and often unequal, margin regularly and closely acutely serrate or sometimes subuplicate-serrate, apex acutely short acuminate. Upper leaves shortly petiolate, gradually smaller upward. Capitula homogamous, discoid, very numerous, arranged in dense terminal and upper axillary usually narrowly pyramidal compound thyrses, shortly pedunculate or subsessile; peduncles 1–2 mm, densely white tomentose; bracts subulate, small. Involucres narrowly cylindric, ca. 3 × 1–1.5 mm, calyculate; bracts of calyculus few, scalelike, very short; phyllaries 4 or 5, green with darker apices, broadly oblong, ca. 1 mm wide, subleathery, arachnoid, glabrescent, margin scarious, apically obtuse or rounded and shortly ciliate. Ray florets absent. Disk florets 3; corolla pale yellow or cream, ca. 6 mm, with ca. 1.5 mm tube and long-exserted funnelform limb; lobes oblong-lanceolate, ca. 1.5 mm, acutely acute. Anthers ca. 2.5 mm; anther tails ca. 0.5 × as long as antheropodia; appendages oblong-lanceolate; antheropodia elongated, narrow, basally slightly dilated. Style branches ca. 1.5 mm, fringed with short papillae, terminal tuft not distinct. Achenes ca. 2.5 mm, pubescent. Pappus white or pale straw-colored, 4.5–5 mm. Fl. Jul–Oct. 

Herbs, rhizomatous. Rhizomes not seen. Stems erect, striate, purplish, 60–65 cm tall, branching in upper part, 3–4 mm in diam. at base, minutely setulose. Leaves long petiolate, basal leaves withered at anthesis; blade papery, lower leaf petiole 4–5 cm, sparsely puberulent, basally leaflike-expanded, auriculate-amplexicaul, with mucronulate teeth margins; blade abaxially purplish, adaxially green, triangular-obovate or triangular-hastate, 8–10 × 8–9 cm, palmately 5-veined, both surfaces adpressed fulvous pubescent, base deeply cordate or sub hastate, margin irregularly dentate, with mucronulate teeth, apex acute or acuminate. Upper leaf petiole 1.5–3.5 cm, fulvous puberulent, basally leaflike-expanded auriculate, amplexicaul; blade smaller, ovate or broadly ovate, 4–5 × 4–4.5 cm, both surfaces fulvous setulose, base subcordate or truncate, margin irregularly dentate with mucronulate teeth, apex acute or acute-acuminate. Uppermost leaves shortly petiolate or subsessile, lanceolate or linear, very small, 1–1.5 cm, margin entire or 2- or 3-denticulate. Capitula discoid, numerous, arranged in terminal corymbose thyrses; peduncles 1–2 mm, densely pubescent, with 1 or 2 scalelike bracts. Involucres cylindric, 1.5–2 × 1.5–2 mm, with 1–3 subulate bracteoles at base; phyllaries 5, oblong, 1–1.5 mm wide, subleathery, sparsely puberulent or subglabrous, obscurely 1–3-veined, margin narrowly scarious, apically obtuse, purplish. Disk florets 5, distinctly exserted beyond phyllaries; corolla yellow-purplish, ca. 5 mm, with 2–2.5 mm tube and narrowly campanulate limb; lobes ovate-lanceolate, apically acute, papillose. Anthers linear, ca. 3 mm; anther tails long; antheropodium stout, basally slightly dilated. Style branches obtuse, fringed with rather short fine papillae. Achenes ca. 2.5 mm, glabrous. Pappus purplish brown. Fl. Sep. 

- Picea forests; ca. 3300 m. S Xizang (Qyrong). 


川西合耳菊 chuan xi he er ju 


Herbs, rhizomatous, forming large clumps. Rhizome woody, creeping. Stems 1–3, erect, 30–70 cm tall, simple or few branched in upper part, densely to sparsely arachnoid and ± glabrescent, leafless in lower part at anthesis. Leaves rather crowded; petiole 0.5–2 cm, sparsely arachnoid; blade ovate-lanceolate, lanceolate, or elliptic-oblong, 6–12 × 2–4.5 cm, papery, both surfaces at first sparsely arachnoid, glabrescent, pinnately veined, lateral veins (6–)8–10, arcuate, strongly ascending, prominent abaxially, base cuneate to rounded and often unequal, margin regularly and closely acutely serrate or sometimes subuplicate-serrate, apex acutely short acuminate. Upper leaves shortly petiolate, gradually smaller upward. Capitula homogamous, discoid, very numerous, arranged in dense terminal and upper axillary usually narrowly pyramidal compound thyrses, shortly pedunculate or subsessile; peduncles 1–2 mm, densely white tomentose; bracts subulate, small. Involucres narrowly cylindric, ca. 3 × 1–1.5 mm, calyculate; bracts of calyculus few, scalelike, very short; phyllaries 4 or 5, green with darker apices, broadly oblong, ca. 1 mm wide, subleathery, arachnoid, glabrescent, margin scarious, apically obtuse or rounded and shortly ciliate. Ray florets absent. Disk florets 3; corolla pale yellow or cream, ca. 6 mm, with ca. 1.5 mm tube and long-exserted funnelform limb; lobes oblong-lanceolate, ca. 1.5 mm, acutely acute. Anthers ca. 2.5 mm; anther tails ca. 0.5 × as long as antheropodia; appendages oblong-lanceolate; antheropodia elongated, narrow, basally slightly dilated. Style branches ca. 1.5 mm, fringed with short papillae, terminal tuft not distinct. Achenes ca. 2.5 mm, pubescent. Pappus white or pale straw-colored, 4.5–5 mm. Fl. Jul–Oct. 

- Open sunny places; 2900–3900 m. Sichuan, Xizang, Yunnan. 


心叶合耳菊 xin ye he er ju 

Herbs, rhizomatous. Rhizomes not seen. Stems erect, striate, flexuous, simple, gray-white pubescent or subglabrous. Leaves long petiolate; petiole 4–8.5 cm, sparsely puberulent, basally slightly expanded; blade adaxially green, ovate-cordate or cordate, 9–13 × 6–10 cm, subleathery, palmately 5-veined, abaxially fulvous setulose on veins, adaxially glabrous, margin irregularly coarsely dentate, with mucronate broadly triangular teeth or subrepand-dentate, apically acuminate or acute. Capitula discoid, numerous, arranged in terminal and axillary in upper part pyramidal thyrses or corymbose pani- cles; peduncles 3–6 mm, densely fulvous pubescent. Involucres cylindric, 1.5–2 mm wide; phyllaries 3, subleathery, oblong, 1.5–2 mm wide, glabrous, sometimes slightly 3–6-veined, apically obtuse. Ray florets absent. Disk florets 3; corolla yellow, 5–6 mm, with 2.5–3 mm tube and funnelform limb; lobes ob-

- Mixed forests; ca. 3000 m. Yunnan (Dongchuan).


红缨合耳菊 hong ying he er ju

Senecio erythropappus Bureau & Franchet, J. Bot. (Morot) 5: 73. 1891; Cacalia diantha (Franchet) Handel-Mazzetti; S. dianthus Franchet; S. glumaceus Dunn; S. paucinervis Dunn; S. talongensis Franchet; S. viridiflavus Handel-Mazzetti; Vernonia mairei H. Léveillé.

Herbs, rhizomatous. Rhizome woody. Stems solitary or several, erect or rarely decumbent, to 100 cm tall, usually branching in synflorescence, leafless in lower part at anthesis, fulvous pubescent, arachnoid-pubescent, or subglabrous, glabrescent. Leaves long petiolate; petiole 2–6 cm, sparsely pubescent, subglabrescent; blade ovate, ovate-lanceolate, or oblong-lanceolate, 10–20 × 2.5–7 cm, papery or thinly so, abaxially pubescent especially on veins to subglabrous, adaxially sparsely pubescent to glabrous, pinnately veined, pinnately veined, lateral veins 6–10, arcuate-ascending, prominent abaxially, basale cor dedicate, subtruncate, rounded, or cuneate, margin regularly and closely to coarsely and unequally shallowly to deeply serrate or dentate, apex acuminate or caducate-acuminate. Upper and branch leaves smaller, shortly petiolate, narrowly lanceolate. Capitula homogamous, discoid, very numerous, arranged in terminal and upper axillary, usually abundant, broadly pyramidal compound thyr Se, shortly pedunculate or subsessile; peduncles very short, usually with 1 linear bract. Involucres narrowly cylindric, 4.5–5 × 1–1.5 mm, calyculate; bracts of calyculus 3 or 4, minute; phyllaries 2 or 3 (or 4), linear-oblong, herbaceous, sometimes white tomentose or pubescent, especially at base, or glabrous, margin broadly scarious, apically obtuse and puberulent. Ray florets absent. Disk florets 5, conspicuously exceeding phyllaries, corolla yellow, 6–7 mm, with 3–3.5 mm tube and funnel-shaped limb; lobes oblong-lanceolate, apically puberulent. Anthers linear, 3–3.5 mm, anther tails long; antheropodia slightly dilated at base. Style branches obtuse, fringed with papillae. Achenes ca. 3 mm, sparsely puberulent. Pappus white, ca. 6 mm. Fl. and fr. Aug.

- Forest margins, rocky places; 2400–2700 m. Sichuan (Muli).


掌裂合耳菊 zhang lie he er ju

Herbs, rhizomatous. Rhizomes robust, woody, 8–10 mm in diam. Stem solitary, erect, striate, 35–40 cm tall, flexuous, simple, glabrous. Leaves long petiolate, basal leaves withered at anthesis. Median leaf petiole 3.5–4 cm, basally not expanded; blade abaxially pale green, adaxially green, ovate-triangular, 4–8 × 5–6.5 cm, abaxially glabrous, adaxially shortly pubescent on veins, palmately veined, veins prominent abaxially, base cor dedicate, margin deeply palmately 5-sect; terminal lobe broader, oblong-lanceolate, 2.5–3 cm wide, coarsely dentate or lobed, apex acuminate, lateral lobes narrow, 2- or 3-denticulate. Upper leaves similar to median leaves, smaller; uppermost leaves shortly petiolate or subsessile, lanceolate, 3-lobed or entire. Capitula discoid, numerous, arranged in terminal and upper leaf axils, corymbose-paniculate; peduncles 4–5 mm, sparsely puberulent, with 1 or 2 scalelike bracteoles. Involucres cylindric, 4.5 × 1.5–2 mm, calyculate; bracts of calyculus 1 or 2, scalelike; phyllaries 3, broad oblong, ca. 2 mm wide, subleathery, glabrous, margin broadly scarious, apically obtuse and ciliate. Florets 3, distinctly exceeding phyllaries, corolla yellow, 6–7 mm, with ca. 3 mm tube and funnel-shaped limb; lobes oblong-lanceolate, apically acute, puberulent. Anthers linear, 2.5–3 mm, basally long cuate; antheropodia slightly dilated at base. Style branches excurved, apically obtuse, fringed with papillae. Achenes 3–3.5 mm, glabrous, ribbed. Pappus reddish, 6–7 mm. Fl. May.

- Guizhou (Guiyang).


羽裂合耳菊 yu lie he er ju

Herbs, basal parts not seen. Stems erect, to 110 cm tall, branching in upper part, white puberulent, glabrescent. Leaf petiole 1–1.5 cm, slender, sparsely puberulent; blade ovate-lanceolate, 3.5–5 × 3–4 cm, papery, both surfaces sparsely and shortly ± white tomentose on main veins, very deeply pinnatifid, with lanceolate, attenuate, pinnately basally few dentate or lobulate terminal lobe and (4–)6–8 narrowly lanceolate or oblong-lanceolate, coarsely few dentate lateral lobes. Upper and branch leaves smaller, with shorter and fewer lateral lobes, shortly petiolate. Capitula homogamous, discoid, numerous and glomerulate in abundant, pyramidal leafy terminal thyrses, shortly pedunculate or subsessile; peduncles densely shortly tomentose, 1- or 2-bracteolate. Involucres cylindric, 3–4 × 1–2 mm, calyculate; bracts of calyculus 2 or 3, minute; phyllaries 3, oblong or obovate-oblong, 1.5–2 mm wide, subleathery, glabrescent to glabrous, margin broadly scarious, apically obtuse or sometimes acute and puberulent. Ray florets absent. Disk florets 3; corolla pale yellow, 6–7 mm, with ca. 2.5 mm tube and long-exserted funnelform limb; lobes oblong-lanceolate, ca. 2 mm, apically acute, papilllose. Anthers ca. 3.5 mm; anther tails ca. 1.5 × as long as antheropodia, terminal tuft indistinct, shorter. Achenes ca. 3 mm, glabrous. Pappus somewhat rubescent, 6–6.5 mm. Fl. Sep.

- Rocky places; 2800–3100 m. Yunnan.


森叶合耳菊  er ye he er ju


Herbs, basal parts not seen. Stem solitary, erect to 120 cm tall, flexuous, shortly branching in synflorescence, fulvous tomentose, glabrescent. Leaves shortly petiolate; petiole 1–2 cm, sparsely fulvous tomentose, glabrescent; blade elliptic or oblanceolate-elliptic, 6–22 × 1.5–6 cm, membranous, abaxially sparsely arachnoid and glabrescent, adaxially sparsely shortly scattered setulose, pinnately veined, lateral veins 16–18, arcuate-ascending, conspicuous abaxially, base cuneate or attenuate, margin minutely serrate-serrulate, apex long acuminate. Capitula homogamous, disciform, numerous, 20–25 in dense rounded axillary and terminal glomeruliform coryumbs; peduncles short, ca. 5 mm, fulvous tomentose, basally bracteate, 1- or 2-bracteolate; bracts and bracteoles linear. Involucres cylindric, ca. 3 × 1.5 mm, calyculate; bracts of calyculus 5, linear-sulcate, to 1/2 as long as phyllaries; phyllaries 5, oblong, ca. 1.5 mm wide, subleathery, sparsely puberulent, glabrescent, margin broadly scarious, apically obtuse or sometimes acute and puberulent. Marginal female florets 2; corolla filiform, 4.5–5 mm, apically minutely 5-denticulate. Disk florets 3 or 4; corolla yellow, ca. 7 mm, with 2–2.5 mm tube and long-exserted funnelform limb; lobes ovate-oblong, ca. 1.3 mm, apically acute. Anthers ca. 3 mm; anther tails slightly exceeding antheropodia; appendages oblong-lanceolate; antheropodia rather narrow, basally slightly dilated. Style branches ca. 0.8 mm, fringed with short papillae, central tuft prominent, much longer than laterals. Achenes ca. 1.5 mm, glabrous. Pappus white, ca. 5.5 mm. Fl. Aug–Sep.

Subshrubs or shrubby herbs, to 180 cm tall. Stems slender, branching, glandular pubescent. Leaves shortly petiolate; petiole ca. 5 mm, sparsely pubescent, basally auriculate; auricle subcircular, small; blade narrowly elliptic or oblong-elliptic, ca. 17 × 2.5 cm, papery, abaxially sparsely shortly pubescent, adaxially sparsely shortly scattered setulose, pinnately veined, lateral veins 16–18, arcuate-ascending, somewhat prominent abaxially, base narrowly cuneate, margin prominently mucronate-serrate, apex acute-acuminate; uppermost and branch leaves smaller. Capitula minutely radiate, very numerous, arranged in lax axillary and terminal rounded compound coryumbs; peduncles 1–3 mm, glandular pubescent, 1- or 2-bracteate and/or bracteolate. Involucres cylindric, 3–3.5 × ca. 1 mm, calyculate; bracts of calyculus 2 or 3, minute; phyllaries 5, oblong-linear, ca. 0.8 mm wide, subglabrous, margin scarious, Forest and thicket margins, rocky slopes; 2500–3300 m. W Yunnan (Fugong, Tengchong) [N Myanmar].


森叶合耳菊 san she he er ju


Subshrubs or shrubby herbs, erect or sometimes scrambling, to 150 cm tall. Stems flexuous, slender, branching, sparsely pubescent, glabrescent. Leaves shortly petiolate; petiole 1–2 cm, glabrous, not auriculate; blade elliptic-lanceolate to broadly oblong-elliptic, 10–15 × 4–6.5 cm, membranous or thinly papery, adaxially nitid, glabrous, pinnately veined, lateral veins 10–14, arcuate-ascending and intramarginally uniting, prominent abaxially, base rounded or broadly cuneate and sometimes unequal, margin finely to coarsely and irregularly mucronate-serrate, apex long acuminate or acuminate-caudate; leaves of synflorescence branches smaller, otherwise similar. Capitula minutely radiate, very numerous, arranged in lax axillary and terminal rounded compound coryumbs; peduncles 5–6 mm, slender, sparsely puberulent; bracts linear-sulcate, minute. Involucres cylindric, 3–4 × ca. 1 mm, minutely calyculate; bracts of calyculus 1–3, subulate; phyllaries 5, linear-oblong, ca. 1 mm wide, glabrous, margin broadly scarious, apically obtuse or subacute and puberulent. Ray florets 3 or 4; corolla yellow, 4–5 mm, with ca. 2 mm tube and minute, to 2.5 mm lamina, usually shorter than style. Disk florets 3 or 4; corolla yellow, ca. 5 mm, with ca. 2 mm tube and exserted funnelform limb; lobes oblong-lanceolate, ca. 2.5 mm, apically acute. Anthers ca. 2.5 mm; anther tails ca. 1.5 × as long as antheropodia, basally slightly dilated. Style branches ca. 1.2 mm, fringed with short rounded papillae, terminal tuft small, short. Achenes ca. 1.5 mm, glabrous. Pappus white, ca. 5 mm. Fl. Oct–May.

Forests, among scrub vegetation; 1200–2100 m. Xizang, NW Yunnan [Bhutan, NE India, Myanmar, Nepal, N Thailand].


耳叶合耳菊  er ye he er ju

Subshrubs or shrubby herbs, to 180 cm tall. Stems slender, branching, glandular pubescent. Leaves shortly petiolate; petiole ca. 5 mm, sparsely pubescent, basally auriculate; auricle subcircular, small; blade narrowly elliptic or oblong-elliptic, ca. 17 × 2.5 cm, papery, abaxially sparsely shortly pubescent, adaxially sparsely shortly scattered setulose, pinnately veined, lateral veins 16–18, arcuate-ascending, somewhat prominent abaxially, base narrowly cuneate, margin prominently mucronate-serrate, apex acute-acuminate; uppermost and branch leaves smaller. Capitula minutely radiate, very numerous, arranged in lax axillary and terminal rounded compound coryumbs; peduncles 1–3 mm, glandular pubescent, 1- or 2-bracteate and/or bracteolate. Involucres cylindric, 3–3.5 × ca. 1 mm, calyculate; bracts of calyculus 2 or 3, minute; phyllaries 5, oblong-linear, ca. 0.8 mm wide, subglabrous, margin scarious,


Subshrubs or shrubby herbs, scrambling, to 3 m tall. Stems branching in synflorescence, densely glandular fulvous pubescent, glabrescent. Leaves shortly petiolate; petiole 6–10 mm, pubescent, basally not auriculate; blade elliptic or elliptic-lanceolate, 10–22 × 4.5–6.5 cm, papery, abaxially sparsely to densely glandular fulvous pubescent especially on veins, adaxially glabrous or nearly so, pinnately veined, lateral veins 10–14, arcuate-ascending, prominent abaxially, base broadly cuneate to subrounded, margin finely to rather coarsely and irregularly mucronate-serrate, apex acuminate; leaves of synflorescence branches smaller. Capitula heterogamous, disciform, very numerous, arranged in lax to rather dense axillary and terminal rounded compound corymbs; peduncles to 5 mm, glandular fulvous pubescent, bracteate, few bracteolate; bracts and bracteoles linear or linear-subulate, 2–3 mm. Involucres narrowly cylindric, 5–6 × 1–1.5 mm, calyculate; bracts of calyxulus 2 or 3, linear, ca. 2 mm, puberulent; phyllaries 3 or 4, linear-oblong, glabrous, margin scarious, apically obtuse and puberulent. Ray floret 1; corolla yellow, 5–7 mm, with 3–3.5 mm tube and linear ca. 3 mm lamina. Disk florets 2 or 3; corolla yellow, ca. 7 mm, with ca. 2.5 mm tube and funnelform limb; lobes oblong-lanceolate, ca. 1.5 mm, apically acute. Anthers ca. 3.2 mm, anther tails ca. 0.5 × as long as antheropodia; appendages ovate-oblong; antheropodia long, basally somewhat dilated. Style branches ca. 1 mm, fringed with short papillae, terminal tuft indistinct. Achenes ca. 3.5 mm, glabrous. Pappus straw-colored, 4–4.5 mm. Fl. Aug–Sep.

*Forest margins, streamsides; 2600–3400 m. Xizang [Bhutan, India (Sikkim), Nepal].


*Mei tou he er ju*


Subshrubs or shrubby herbs. Stems erect, to 150 cm tall, simple or corymbose branched in upper part, fulvous pubescent, glabrescent. Leaves shortly petiolate; petiole 1–2 cm, sparsely pubescent; blade elliptic or lanceolate-elliptic, 14–17 × 4.5–7 cm, papery, abaxially dull and sparsely pubescent especially on veins and glabrescent, adaxially ntid and sparsely fulvous pubescent especially on midvein, pinnately veined, lateral veins 12–14, arcuate-ascending, veins prominent abaxially, base cuneate, margin apiculate-denticulate or serrulate, apex acuminate; upper leaves smaller. Capitula radiate, numerous, arranged in terminal rather dense compound corymbs; peduncles 1–2 mm, fulvous pubescent, usually 1- or 2-bracteate and or bracteolate. Involucres narrowly cylindric, 5–6 × 1–1.5 mm, calyculate; bracts of calyxulus 2 or 3, linear, ca. 2 mm, puberulent; phyllaries 3 or 4, linear-oblong, glabrous, margin scarious, apically obtuse and puberulent. Ray floret 1; corolla yellow, 5–7 mm, with 3–3.5 mm tube and linear ca. 3 mm lamina. Disk florets 2 or 3; corolla yellow, ca. 7 mm, with ca. 2.5 mm tube and funnelform limb; lobes oblong-lanceolate, ca. 1.5 mm, apically acute. Anthers ca. 3.2 mm, anther tails ca. 0.5 × as long as antheropodia; appendages ovate-oblong; antheropodia long, basally somewhat dilated. Style branches ca. 1 mm, fringed with short papillae, terminal tuft indistinct. Achenes ca. 3.5 mm, glabrous. Pappus straw-colored, 4–4.5 mm. Fl. Aug–Sep.

*Forest margins, streamsides; 2600–3400 m. Xizang [Bhutan, India (Sikkim), Nepal].

Herbs, perennial. Stems erect, 40–120 cm tall, usually corymbose branched in upper part, fulvous pubescent, glabrescent to glabrous. Leaves shortly petiolate; petiole 3–5 mm, glabrous or sparsely puberulent, not auriculate; blade narrowly elliptic or lanceolate, 8–18 × 1.5–3.5 cm, papery, ntid, abaxially glabrous or sparsely puberulent on veins, adaxially glabrous, pinnately veined, lateral veins 10–12, arcuate-ascending, prominent abaxially, base cuneate or attenuate and often unequal, margin rather remotely mucronate-serrulate or mucronate-serrate, apex acutely long acuminate or cudeate-acuminate and sometimes falcate; upper leaves smaller. Capitula minutely radiate, numerous, arranged in terminal compound corymbs; peduncles 1–2 mm, fulvous puberulent, usually 1- or 2-bracteate and or bracteolate. Involucres narrowly cylindric, 5–6 × 1–1.5 mm, calyculate; bracts of calyxulus 2 or 3, linear, ca. 2 mm, puberulent; phyllaries 3 or 4, linear-oblong, glabrous, margin scarious, apically obtuse and puberulent. Ray floret 1; corolla yellow, 5–7 mm, with 3–3.5 mm tube and linear ca. 3 mm lamina. Disk florets 2 or 3; corolla yellow, ca. 7 mm, with ca. 2.5 mm tube and funnelform limb; lobes oblong-lanceolate, ca. 1.5 mm, apically acute. Anthers ca. 3.2 mm, anther tails ca. 0.5 × as long as antheropodia; appendages ovate-oblong; antheropodia long, basally somewhat dilated. Style branches ca. 1 mm, fringed with short papillae, terminal tuft indistinct. Achenes ca. 3.5 mm, glabrous. Pappus straw-colored, 4–4.5 mm. Fl. Aug–Sep.

*Forest margins, streamsides; 2600–3400 m. Xizang [Bhutan, India (Sikkim), Nepal].

- Mixed forests; 2100–2400 m. Xizang.
theropodia robust, basally slightly dilated. Style branches ca. 1.5 mm, fringed with short papillae, terminal tuft not differentiated. Achenes ca. 2 mm, glabrous. Pappus straw-colored, ca. 7 mm. Fl. Aug–Sep.

Thicket margins; 2100–2700 m. Yunnan (Longchuan Jiang-Nu Jiang divide) [Myanmar].

**Synotis calocephala** differs from *S. acuminata* by its thinner textured, relatively broader, and less deeply denticulate leaves and its conspicuously radiate capitula with 5 phyllaries, 2 or 3 ray florets, and 8–10 mm long ray floret laminae.


**丽江合耳菊** 丽江合耳菊

Herbs, rhizomatous. Rhizomes not seen. Stem solitary, erect or basally curved, striate, slender, sparsely shortly pubescent or ± glabrescent. Basal and lower leaves withered at anthesis, with 1 or 2 scalelike persistent petioles; median leaves 2 or 3, long petiolate; petiole 3.5–5 cm, not winged, sparsely arachnoid and shortly pubescent, basally slightly expanded and subamplexicaul; blade abaxially gray-green, adaxially green, reniform or cordate-reniform, 3–4 × 5–6.5 cm, papery, abaxially arachnoid, adaxially apressed setulose, 3–5-veined from base, lateral veins divaricate, and uniting and netted, base rounded or cordate and attenuate into petiole, margin shallowly repand-dentate with mucronulate teeth. Upper leaves similar to median leaves but smaller, shortly petiolate. Upermost leaves reduced and bractlike, linear or linear-lanceolate, 5–10 × 1–1.5 mm, apically acute. Capitula homogamous, discoid, solitary in bracts of uppermost part, racemose; peduncles 1–2 mm, densely tomentose. Involucres narrowly campanulate, 4–5 × 3–4 mm, calyculate; bracts of calyculus 3 or 4, linear, ca. 1/2 as long as phyllaries, apically acute, phyllaries 5, oblong or oblong-lanceolate, 3–4 × 1.5–2 mm, subleathery, glabrous, margin narrowly scarious, apically slightly acute or obtuse. Florets 5, exserted from involucres; corolla yellow ca. 7 mm, with ca. 3 mm tube and campanulate limb; lobes ovate-lanceolate, 1.5–2 mm, apically acute. Anthers ca. 4 mm, basally obtuse-aucterate; antheropodia rather short, basally slightly dilated. Style branches obtuse or truncate, shortly fringed. Achenes 2–3 mm, glabrous. Pappus white, 4–5 mm. Fl. Jul, fr. Aug.

● Wet places along riversides in valleys; ca. 3000 m. Yunnan.


**丽江合耳菊** 丽江合耳菊

Herbs, rhizomatous. Rhizomes thick, woody. Stems 1–3, erect, 30–60 cm tall, at first sparsely arachnoid and densely pubescent, usually ± glabrescent, shortly branching in synflorescence, leafless or with only small scalelike leaves in lower part at anthesis. Leaves sessile or subpetiolate; blade adaxially green, elliptic to oblanceolate, 4–8 × 1–1.7 cm, papery, abaxially pallid and thinly arachnoid, adaxially sparsely arachnoid, sparsely pubescent and glabrescent, pinnately veined, lateral veins 10, arcuate-ascending, base cuneate to attenuate, sometimes subamplexicaul at attachment to stem, margin rather remotely denticulate with mucronulate teeth, apex shortly acuminate. Upper leaves smaller, otherwise similar. Capitula radiate, usually 3–8 in rather dense terminal corymbs on synflorescence branches; peduncles 5–15 mm, white arachnoid and shortly pubescent, with a linear bract or bracteole. Involucres narrowly campanulate, 3–4 × 3 mm, calyculate; bracts of calyculus 3–5, linear, equaling or exceeding phyllaries, apically acute; phyllaries 8, oblong-lanceolate, 1–1.5 mm wide, subleathery, thinly arachnoid, glabrescent, margin narrowly scarious, apically acute and shortly ciliate. Ray florets absent. Disk florets 9–11; corolla yellow, ca. 9 mm, with ca. 3 mm tube and funnelform limb; lobes oblong-lanceolate, apically acute. Anthers ca. 3.3 mm, anther tails ca. 0.5 × as long as antheropodia; appendages ovate-oblong; antheropodia robust, basally somewhat dilated. Style branches ca. 2 mm, fringed with short papillae, terminal tuft not evident. Achenes ca. 3 mm, glabrous. Pappus straw-colored, ca. 6 mm. Fl. Jul–Aug.

● Forests, thickets, open slopes; 2800–4000 m. NW Yunnan.


**缅甸合耳菊** 缅甸合耳菊

Herbs, rhizomatous. Rhizomes thick, woody. Stems 1–3, erect, 30–60 cm tall, at first sparsely arachnoid and densely pubescent, usually ± glabrescent, shortly branching in synflorescence, leafless or with only small scalelike leaves in lower part at anthesis. Leaves sessile or subpetiolate; blade adaxially green, elliptic to oblanceolate, 4–8 × 1–1.7 cm, papery, abaxially pallid and thinly arachnoid, adaxially sparsely arachnoid, sparsely pubescent and glabrescent, pinnately veined, lateral veins 10, arcuate-ascending, base cuneate to attenuate, sometimes subamplexicaul at attachment to stem, margin rather remotely denticulate with mucronulate teeth, apex shortly acuminate. Upper leaves smaller, otherwise similar. Capitula radiate, usually 3–8 in rather dense terminal corymbs on synflorescence branches; peduncles 5–15 mm, white arachnoid and shortly pubescent, with a linear bract or bracteole. Involucres narrowly campanulate, 3–4 × 3 mm, calyculate; bracts of calyculus 3–5, linear, equaling or exceeding phyllaries, apically acute; phyllaries 8, oblong-lanceolate, 1–1.5 mm, 4-veined, 3-denticulate. Disk florets ca. 15; corolla yellow, ca. 7 mm, with ca. 2.5 mm tube and funnelform limb; lobes oblong-lanceolate, ca. 2 mm, apically acute. Anthers ca. 2.7 mm, obtusely long auriculate or subcaudate; anther tails only ca. 0.25 × as long as antheropodia; appendages ovate-oblong; antheropodium stout, basally hardly dilated. Style branches ca. 2 mm, fringed with short papillae, terminal tuft not evident. Pappus straw-colored, ca. 4.5 mm. Fl. Sep.

Alpine meadows; 3000–3300 m. NW Yunnan (Gaoligong Shan) [W. Myanmar].


Herbs, rhizomatous. Rhizomes thick, woody, creeping. Stem usually solitary, erect, 45–60 cm tall, sparsely arachnoid, not branched below synflorescence, leafless in lower part at anthesis. Leaves subpetiolate or sessile; petiole 3–5 mm, narrowly winged; blade adaxially green, lanceolate or narrowly elliptic, 7–15 × 1.5–3 cm, papery, abaxially densely and except for midvein persistently white tomentose, adaxially sparsely arachnoid, scattered puberulent and glabrescent, pinnately veined, lateral veins 10–14, arcuate-ascending, base attenuate, not auriculate, margin remotely and minutely mucronulate-denticulate, apex shortly acuminate. Upper leaves smaller; uppermost leaves linear-lanceolate to linear, bractiform. Capitula discoid, numerous (15–17) in rather dense terminal compound corymbs; peduncles 5–15 mm, apex acute. Involucres narrowly campanulate, 5–6 × 3 mm, calyculate; bracts of calyculus 2–4, linear, equaling phyllaries; phyllaries 8, oblong, 1.5–2 mm wide, subleathery and somewhat carinate, white arachnoid-tomentose, margin narrowly scarious, apically acute and ciliate. Ray florets absent. Disk florets 8 or 9; corolla yellow, 8–10 × 2–3 mm, 4-veined, 3-denticulate. Disk florets ca. 10; corolla tube ca. 3 mm; lamina ovate-lanceolate, ca. 2 mm, apically acute. Anthers ca. 3.5 mm; anther tails ca. 0.75 × as long as antheropodia; appendages ovate-lanceolate; antheropodia slightly dilated at base. Style branches ca. 1.5 mm, fringed with short papillae, terminal tuft short. Achenes 3–3.5 mm, glabrous. Pappus dirty white or pale straw-colored, 7–8 mm. Fl. Aug–Sep.

- Thickets, streamsides, roadsides; 2500–3200 m. W Sichuan (Kangding).

**Synotis setchuenensis** is characterized by its phyllaries subleathery and carinate and leaves densely white tomentose abaxially. It superficially resembles *Senecio densiserratus*, which differs by having densely serrate leaf margins and anthers not caudate.


Subshrubs, with thick, woody, branching, procumbent or ascending rhizomes. Aerial stems several, erect, 20–60 cm tall, glabrous, not branched below synflorescence, leafy except toward base. Leaves very shortly petiolate or sessile; blade lanceolate, sometimes slightly falcate, 5–10 × 0.5–1.5 cm, subleathery, glabrous or nearly so, pinnately veined, lateral veins 10–14, strongly ascending, inconspicuous, base cuneate, margin regularly and closely mucronulate-serrate, apically short obtusely acuminate-apiculate; upper leaves smaller. Capitula radiate, numerous, arranged in terminal compound corymbs, ca. 1.5 cm in diam.; peduncles 1–2 cm, slender, slightly dilated and white arachnoid in upper part, with 1–3 narrowly ob lanceolate bracts or bracteoles at or near base. Involucres subcampanulate, 3–4 × 2.5–3 mm, laxly calyculate; bracts of calyculus 4 or 5, narrowly ob lanceolate or linear; phyllaries 8; oblong-linear, ca. 1.5 mm wide, apically triangular-obtuse or subacute and ciliate. Ray florets: corolla tube ca. 3 mm; lamina yellow, oblong-elliptic, 8–10 × 2–3 mm, 4-veined, 3-denticulate. Disk florets ca. 10; corolla yellow, ca. 6.5 mm, with 2.5–3 mm tube and funnelliform limb; lobes ovate-lanceolate, ca. 2 mm, apically acute. Anthers ca. 3 mm; anther tails ca. 1.25 × as long as antheropodia; appendages ovate-oblong; antheropodia stout, broad, basally slightly expanded. Style branches fringed with short ob lanceolate papillae, terminal tuft not evident. Achenes ca. 4 mm, sparsely pubescent. Pappus white, 4–5 mm. Fl. Aug.

- Rocky places, wet valleys; 1500–2300 m. Nei Mongol, Ningxia (A-qi-Baqi, Helan Shan).


藤菊属 **teng ju shu**

Chen Yulin (陈艺林 Chen Yi-ling); Bertil Nordenstam, Charles Jeffrey

*Cacalia* sect. *Cissampelopsis* Candolle, Prodr. 6: 331. 1838.

Subshrubs or perennial herbs, large, scandent, climbing by means of prehensile petioles. Stems much branched, woody when old. Leaves simple, alternate; petiole prehensile, with thickened persistent bases, not auriculate; blade broadly ovate, ovate, or triangular, base cordate, unlobed, palmately 3–7-veined from near base, central vein with 1 or 2 pairs of ascending laterals. Capitula numerous, in upper axillary and terminal cymes, compounded into divaricately branching, pyramidal or paniculiform thyrses, heterogamous and radiate or homogamous and discoid, pedunculate. Involucres calyculate, cylindric or narrowly campanulate; receptacle flat; phyllaries 8 or 13, free, herbaceous, margin scarious. Ray florets absent, 5, 6, or 8; lamina yellow, spreading, 4- or 5-veined, apically usually 3-denticulate. Disk florets 8–20; corolla white, pinkish, or yellow; anthers distinctly caudate, with tail 0.5–2 × as long as antheropodia; antheropodia subcylicindric or somewhat balusterform, basally hardly to slightly dilated, with somewhat enlarged basal lateral cells; endothecial cell wall thickenings comparatively few, polar and radial, cells rather short; style branches truncate or convex, with short to rather long marginal papillae and with or without a prominent central tuft of much longer papillae. Achenes cylindric, ribbed, glabrous, epidermal cells striate or smooth. Pappus capillary-like, uniform, present in all florets, white, dirty white, or rubescent.
Ten species: tropical Asia; six species (three endemic) in China.

The genus is divisible into two well-marked sections (not described here), characterized by discoid and radiate capitula, respectively.

1a. Capitula radiate; corolla truly yellow.
1b. Capitula discoid; corolla pale yellow, white, or pinkish.

2a. Phyllaries 5 or 8; ray florets 5 or 6, lamina 3–5 mm; pappus whitish ................................................. 5. C. buinalia
2b. Phyllaries 13; ray florets 8, lamina ca. 10 mm; pappus reddish ................................................................. 6. C. erythrochaeta

3a. Leaves leathery, margin callose-denticulate, both surfaces glabrous; phyllaries glabrous ......................... 1. C. corifolia
3b. Leaves papery to subleathery, margin repand-dentate or denticulate, abaxially tomentose, arachnoid-tomentose, or glandular pubescent; phyllaries hairy.

4a. Florets 15–17; leaves abaxially with dense persistent yellowish white tomentum, peduncles and phyllaries densely tomentose ......................................................... 4. C. spelaeicola
4b. Florets 8–10; leaves, stems, peduncles, and phyllaries arachnoid-tomentose or glandular pubescent.

5a. Leaves at least when young abaxially grayish arachnoid-tomentose; peduncles and phyllaries sparsely arachnoid-tomentose ................................................................. 2. C. volubilis
5b. Leaves abaxially fulvous glandular pubescent; peduncles and phyllaries glandular pubescent ............ 3. C. glandulosa


革叶藤菊 ge ye teng ju

Subshrubs or herbs, large, scandent, to 3–7 m. Stem becoming woody, glabrous or nearly so. Petiole 3–6 cm, glabrous; leaf blade ovate or broadly ovate, 8–14 × 4.5–10.5 cm, leathery or subleathery, glabrous, peltately 5–7-veined from base, veins prominent abaxially, base cordate or sometimes subtruncate, margin minutely to sometimes coarsely callose-denticulate, apex acuminate. Upper and synflorescence leaves smaller, ovate or ovate-lanceolate, basally subcordate, rounded, or truncate. Capsule discoid, numerous, arranged in usually dense terminal and upper axillary compound corymbs, forming large divaricately branching paniculoid thyrses; synflorescence branches exceeding leaves, sparsely or densely glandular pubescent; peduncles (3–)8–15 mm, slender, glandular pubescent, basally bracteolate; bracts and bracteoles linear-lanceolate, 1–2 mm, acutely pubescent. Involucres cylindrical, 5–6 × 2–3 mm, calyculate; bracts of calyculus 4 or 5, linear-lanceolate, 1–2 mm; phyllaries 8, linear-oblong, 1.5–1.7 mm wide, subleathery, glabrous, margin broadly scarious, glabrous, acutely pubescent or subobtuse and puberulent. Ray florets absent. Disk florets ca. 10; corolla pale yellow, cream, or pinkish white, 8–9 mm, with ca. 3.5 mm tube and narrowly funnelform limb; lobes oblong-lanceolate, ca. 2 mm, acutely pubescent. Anthers ca. 3.5 mm; anther tails ca. equaling or slightly exceeding antheropodia; appendages oblong-lanceolate; antheropodia hardly dilated toward base. Style branches ca. 2 mm, fringed with short papillae, terminal tuft rather short, longer than laterals. Achenes cylindrical, 2.5–3 mm, glabrous. Pappus white, 8–8.5 mm. Fl. Sep–Jan of next year.

Climbing on trees and shrubs in mixed forests and thickets; 1500–2800 m. Xizang, Yunnan [Bhutan, India, Myanmar, Thailand].


藤葉 teng ju

Cacalia volubilis Blume, Bijdr. 908. 1826; Senecio araneosus Candolle; S. blumei Candolle; S. cacaifolius Schultz Bipontinus var. araneosus (Candolle) Franchet; S. hoi Dunn; S. ligularia J. D. Hooker var. araneosus (Candolle) H. Léveillé; Vernonia esquirolii Vaniot.

Subshrubs or herbs, large, scandent, to 3 m or more. Stems becoming woody, ± white arachnoid-tomentose and sometimes also sparsely brown setulose, ± glabrescent. Petiole 3–6 cm, stout, ± tomentose and sometimes spuriously brown setulose; leaf blade adaxially green, ovate or broadly ovate, to 15 × 12 cm, subleathery, abaxially grayish with dense to sparse arachnoid-floccose tomentum and sometimes also brownish setulose on veins, adaxially sparsely arachnoid, glabrescent and sometimes shortly scarious-setulose, peltately 5–7-veined from base, base cordate or sometimes hastate, margin rather remotely minutely to coarsely repand-dentate with mucronulate teeth, acutely acuminate-apiculate. Upper and synflorescence leaves smaller, basally cordate to rounded. Capsule discoid, numerous, arranged in rather lax to dense terminal and upper axillary compound corymbs, divaricately branching; branches sparsely to densely white tomentose and sometimes also with brownish glandular hairs; peduncles 5–15 mm, slender, arachnoid-tomentose, basal bracteate, 3–5-bracteolate; bracts and bracteoles linear, 3–4 mm, pubescent. Involucres cylindrical, 7–8 × 2–3 mm, calyculate; bracts of calyculus 4 or 5, small, pubescent or glabrous, margin broadly scarious, acutely pubescent, or glabrous, margin broadly scarious, acutely pubescent. Ray florets absent. Disk florets 8–10; corolla white, pale yellow, or purplish, 9–10 mm, with 4–4.5 mm tube and narrowly funnelform limb; lobes oblong-lanceolate, ca. 2 mm, acutely pubescent. Anthers ca. 3.5 mm, anther tails ca. 0.75–0.8 × as long as antheropodia; appendages ovate-lanceolate; antheropodia elongated, narrow, basally only slightly dilated. Style branches ca. 3.7 mm, fringed with rather short papillae, terminal tuft prominent, much longer than laterals. Achenes cylindrical, ca. 4 mm, glabrous. Pappus white, 8–9 mm. Fl. Oct–Jan.

Climbing on trees and shrubs in forests and thickets; 800–2000 m. Guangdong, Guangxi, Guizhou, Hainan, Yunnan [NE India, Malesia, Myanmar, Thailand, Vietnam].

腺毛藤菊 xian mao teng ju

Subshrubs or herbs, large, scandent. Stems becoming woody, glandular pubescent. Leaves adaxially green, ovate or broadly ovate, 7–14 × 5–10 cm, papery, abaxially densely glandular fulvous pubescent, adaxially thinly arachnoid and glabrescent, base cordate, margin repand-denticulate or dentate with apiculate teeth, apex acute-acuminate. Upper and synflorescence leaves smaller, ovate, basally subtruncate. Capitula discoid, numerous, arranged in dense terminal and upper axillary compound corymbs, forming narrow thyrse; synflorescence branches mostly shorter than leaves, densely glandular pubescent; peduncles 4–10 mm, slender; bracts and/or bracteoles 2 or 3, linear-subulate, 2–3 mm, glandular pubescent. Involucres broadly cylindric, 7–8 × 2.5–3.5 mm, calyculate; bracts of calyculus 3–5, linear-subulate, ca. 2 mm; phyllaries 8, linear-oblong, 1.5–2 mm wide, herbaceous, sparsely finely pubescent margin narrowly scarious, sparsely finely pubescent, apically acute. Ray florets absent. Disk florets ca. 10; corolla white, ca. 12 mm, with 5–5.5 mm tube and narrowly funnelform limb; lobes oblong-lanceolate, ca. 3.2 mm, apically acute. Anthers ca. 4.5 mm; anther tails ca. 0.5 × as long as antheropodium; appendages oblong-lanceolate; antheropodia stout, basally somewhat dilated. Style branches ca. 3 mm, fringed with short papillae, central tuft much longer, stout, conspicuous. Achenes cylindric, 4.5–5 mm, glabrous. Pappus white or dirty white, ca. 11 mm. Fl. Jan.

- Climbing in ravines; 2300–2400 m. Yunnan.


岩穴藤菊 yan xue teng ju


Subshrubs or herbs, large, scandent, to 5 m or more. Stems becoming woody, at first white arachnoid-tomentose, ± glabrescent. Petiole 3–6 mm, stout, densely tomentose; leaf blade abaxially yellowish white, adaxially green, ovate or broadly ovate, 4–11 × 4–8 cm, papery, abaxially densely arachnoid, adaxially at first sparsely arachnoid and glabrescent, palely 3–5-veined from base, base cordate, margin repand-denticulate, apex acute-acuminate-apiculate. Upper and synflorescence leaves smaller, ovate or ovate-lanceolate, basalily cordate to cuneate. Capitula discoid, numerous, arranged in 7–10-headed terminal and upper axillary compound corymbs; synflorescence branches divaricate, densely tomentose; peduncles short, 3–5 mm, densely tomentose, usually basally bracteate; bract linear. Involucres cylindric, 6–7 × 2.5–4 mm, calyculate; bracts of calyculus 6–8, linear, unequal, densely tomentose; phyllaries 8, linear-oblong, 1.5–2 mm, herbaceous, densely tomentose, margin broadly scarious, densely tomentose, apically acutely triangular and puberulent. Ray florets absent. Disk florets 15–17; corolla white, 9–10 mm, with ca. 4 mm tube and narrowly funnelform limb; lobes oblong-lanceolate, ca. 1.8 mm, apically acute. Anthers ca. 4 mm; anther tails slightly shorter than to ca. 2 × as long as antheropodia; appendages oblong-lanceolate, antheropodia somewhat dilated toward base. Style branches 3–3.5 mm, fringed with rather long papillae, terminal tuft stout, distinct, much exceeding laterals. Achenes cylindric, ca. 5 mm, glabrous. Pappus white or dirty white, ca. 9 mm. Fl. Nov–Dec.

- Climbing on trees and shrubs in mixed forests; 1000–2000 m. Guangxi, Guizhou, Sichuan, Yunnan.


尼泊尔藤菊 ni bo er teng ju


Subshrubs or herbs, large, scandent, to 3–5 m. Stems becoming woody, white tomentose. Petiole 3–5 cm, densely to sparsely arachnoid, sometimes also fulvous hairy; leaf blade abaxially grayish white, adaxially deep green, ovate or ovate-triangular, 5–10 × 3.5–7 cm, thinly papery, abaxially arachnoid, adaxially at first sparsely arachnoid, glabrescent, palpately 3–5-veined, base cordate, margin ± sinuate-denticulate with mucronulate teeth, apex acute-acuminate-apiculate. Upper and synflorescence leaves smaller, oval to lanceolate, basally cordate to cuneate. Capitula raditate, 8–12 mm in diam., numerous, arranged in usually 3–5-headed terminal and upper axillary compound corymbs, forming rather lax divaricately branching thyrsoid clusters; peduncles 10–15 mm, slender, densely gray tomentose, with 1 or 2 linear-subulate bracts or bracteoles. Involucres cylindric to narrowly campanulate, 8–12 × 4–6 mm, calyculate; bracts of calyculus 5, linear-subulate, unequal, much shorter than phyllaries; phyllaries 5 or 8, oblong-lanceolate, 2.5–3 mm wide, herbaceous, densely to sparsely arachnoid-tomentose, margin broadly scarious, apically obtuse to acute and puberulent. Ray florets 5 or 6; corolla tube 7–8 mm; lamina yellow, oblong-linear, 3.5 × 1–1.5 mm, 4- or 5-veined, apex entire or 3-denticulate. Disk florets 10–12; corolla yellow, 13–14 mm, with ca. 7.5 mm tube and funnelform limb; lobes oblong-lanceolate, ca. 2 mm, apically acute. Anthers 3.5–4 mm; anther tails shorter than antheropodia; appendages ovate-lanceolate; antheropodia dilated toward base. Style branches ca. 2.5 mm, fringed with short papillae, terminal tuft absent. Achenes cylindric, ca. 5.5 mm, glabrous. Pappus white or dirty white, yellowish at base, 11–12 mm. Fl. Feb.

- Climbing in scrub; ca. 2100 m. Yunnan [Bhutan, India (Sikkim), Nepal].


赤缨藤菊 chi ying teng ju

*Senecio erythrochaeta* Buchanan-Hamilton ex D. Don var. *bamusetorum* Handel-Mazzetti.

Subshrubs or herbs, large, scandent. Stems becoming woody, at first white arachnoid, glabrescent. Petiole 3–7 cm,
abaxially sparsely arachnoid or subglabrescent; leaf blade abaxially grayish, adaxially green, ovate or triangular, 7–13 × 4–12 cm, papery or submembranous, abaxially arachnoid, adaxially sparsely arachnoid and glabrescent, palmately 3–7-veined from base, base cordate, margin repand or sinuate-denticulate with sparsely arachnoid and glabrescent, palmately 3–7-veined from 0.5–2 cm, papery or submembranous, abaxially arachnoid, adaxially grayish, adaxially green, ovate or triangular, 7–13 × 4–12 mm, mucronulate teeth, 0.5–2 cm, pubescent, spreading or reflexed; phyllaries 13, linear-subulate, 1–2 mm wide, herbaceous, sparsely arachnoid, margin scarious, apiically acute and papery


千里光属 qian li guang shu

Herbs perennial or annual, erect, rarely stoloniferous, decumbent, or rarely scandent, rhizomatous. Stems usually leafy, rarely subscapiform. Leaves simple; radical leaves usually petiolate, not auriculate, deltoid, lyrate or pinnately divided; stem leaves usually sessile, pinnately veined, basally often auriculate, lyrate or pinnately lobed, rarely unlobed, ± dentate. Capitula rarely solitary, axillary, usually few to numerous, arranged in terminal simple or compound corymb or thyrses, heterogamous and radiate or homogamous and discoid, erect or nodding, usually pedunculate. Involucres calyculate, hemispheric, campanulate, or cylindric; receptacle flat; phyllaries 5–22, usually free, rarely connate to middle or above, herbaceous or leathery, margin scarious or membranous. Ray florets absent or 1–17(–24); lamina yellow, usually conspicuous, sometimes minute, 2–9-veined, apiically usually 3-denticulate. Disk florets 3 to many; corolla yellow; limb funnelform or cylindric; lobes 5. Anthers oblong to linear, usually shortly obtuse-auriculate, rarely ± caudate with tail to 0.25 × as long as antheropodium; antheropodia balusteriform, basally slightly to markedly dilated, with enlarged basal lateral cells; endothecial cell wall thickenings numerous, radial (inner anticlinal), cells often elongated. Style branches truncate or less often convex, with rather obtuse semicircle of marginal papillae, not appendiculate and devoid of a central tuft of longer papillae. Achenes cylindric, ribbed, glabrous or pubescent, epidermal cells smooth or papillose. Pappus capillary-like, uniform or sometimes dimorphic by presence of apiically floaked hairs, white, straw-colored, or reddish brown, sometimes absent from ray florets or rarely from all florets.

At least 1,200 species: worldwide (except Antarctica) in the sense adopted here, but generic limits in some areas still uncertain; 65 species (39 endemic) in China.

The generic concept provided here is considered to cover Senecio s.s. plus a fringe of taxa that can be considered peripheral to Senecio s.s. but not extending to Senecio s.l. (fide Vincent).


The following three taxa, described or reported from China, are of uncertain identity:

Senecio pelleifolius King ex J. R. Drummond (Bull. Misc. Inform. Kew 1911: 271. 1911). One of us (Jeffrey) notes that this is a name of uncertain identity, perhaps an older synonym of Parasenecio palmatiescatus.

Senecio campestris (Retzius) Candolle var. oliganthus Franchet (Nouv. Arch. Mus. Hist. Nat., sér. 2, 6: 54. 1883). One of us (Jeffrey) indicates that this belongs to a species of Tephroseris, either T. subdentata or T. kirilowii, and another of us (Nordenstam) concurs.

Senecio lancefer J. R. Drummond (Bull. Misc. Inform. Kew 1911: 270. 1911; Ligularia lancefera (J. R. Drummond) R. C. Srivastava & C. Jeffrey). One of us (Jeffrey) treats this as a Ligularia species, while another of the Asteraceae coauthors (Ilirionov) has not seen any material of this species and does not know to which genus it belongs—according to the description, S. lancefer is unlike any species of Ligularia distributed in Xizang.

1a. Plants annual.
2a. Capitula discoid, without marginal radiate female florets.
3a. Phyllaries 18–22; calyculus bracts 7–11, long blackish tipped; synflorescences compact, peduncles

62. S. vulgaris
3b. Phyllaries ca. 15; calyculus bracts 4 or 5, without or sometimes with short blackish tip; synflorescences
lax, peduncles 1.5–4 cm ............................................................. 61. *S. dubitabilis*

2b. Capitula radiate, with at least a few, though sometimes inconspicuous, marginal radiate female florets.

4a. Capitula solitary, axillary; achenes glabrous, pappus hairs few, unequal, ca. 1.5 mm ............... 65. *S. yungningensis*

4b. Capitula cyme; achenes pubescent, pappus hairs numerous, 3–6 mm.

5a. Laminae of marginal female florets conspicuous, ca. 6 mm, much exceeding involucre.

6a. Leaves undivided, broadly linear to oblong, marginally few toothed or subentire; phyllaries 13,
with 2–5 green calyculus bracts; ray florets 7 or 8 ................................................................. 58. *S. subdentatus*

6b. Leaves pinnatifid, leaf lobes oblong or linear-oblong, marginally entire or 1- or 2-denticulate;
phyllaries 15–20, with 8–10 blackish tipped calyculus bracts; ray florets 8–12 ............................ 59. *S. desfontainei*

5b. Laminae of marginal female florets very short, scarcely exceeding involucre.

7a. Phyllaries united in lower 1/3–3/4; pappus hairs fasciculately connate, persistent; achenes sparsely
puberulent .......................................................... 64. *S. oryzetorum*

7b. Phyllaries free; pappus hairs free, deciduous; achenes densely pubescent.

8a. Leaves pinnatifid; leaf lobes broad, oblong-lanceolate, marginally entire or remotely denticulate;
ray florets ca. 12; pappus hairs ca. 3 mm ................................................................. 63. *S. exul*

8b. Leaves pinnatipartite; leaf lobes narrowly linear; ray florets 4–7; pappus hairs ca. 5.5 mm ..... 60. *S. krascheninnikovii*

1b. Plants perennial.

9a. Capitula discoid, without marginal radiate female florets.

10a. Phyllaries 12–22, usually 13, 18, or 21.

11a. Basal and lower stem leaves deltoid; phyllaries leathery.

12a. Upper stem leaves without winged petioles; auricles inconspicuous or absent ....................... 15. *S. tricespis*

12b. Upper stem leaves with broadly winged petioles; auricles conspicuous, toothed ................ 18. *S. nigrorcinus*

11b. Basal and lower stem leaves pinnatifid or pinnatipartite.

13a. Median stem leaves pinnatipartite; phyllaries broadly lanceolate, marginally fimbriate .......... 31. *S. saussureoides*

13b. Median stem leaves lyrate-pinnatifid; phyllaries lanceolate, marginally entire ................. 32. *S. multiensis*

10b. Phyllaries 5–10, usually 5 or 8.

14a. Leaves abaxially densely white tomentose ........................................................................ 1. *S. kumaenensis*

14b. Leaves abaxially green, not densely tomentose.

15a. Basal and lower stem leaves lyrate-pinnatifid or runcinate.

16a. Achenes pubescent .......................................................... 40. *S. diversipinnus*

16b. Achenes glabrous.

17a. Involucres 8–10 mm, phyllaries 8; median stem leaves with up to 10 lateral lobes ............. 8. *S. pseudomairei*

17b. Involucres ca. 6 mm, phyllaries 5; median stem leaves with 14–20 lateral lobes ............... 11. *S. acutipinnus*

15b. Basal and lower stem leaves deltoid.

18a. Phyllaries 5, florets 5 or 6 ..................................................... 16. *S. humbertii*


19a. Upper stem leaves with broadly winged petioles; phyllaries leathery, apically and on upper
margin dark .............................................................................. 18. *S. nigrorcinus*

19b. Upper stem leaves with unwinged or with narrowly winged petioles; phyllaries herbaceous,
apically and marginally puberulent or fimbriate-hairy.

20a. Capitula numerous, arranged in terminal corymb, ca. 7 × 3 mm; florets ca. 10 .............. 17. *S. liangshanensis*

20b. Capitula solitary or rarely paired in axils of uppermost leaves, forming a terminal racemose
cyme, 8–10 × 5–8 mm; florets 15–18 ............................................................. 14. *S. lijiangensis*

9b. Capitula radiate, with at least a few, though sometimes inconspicuous, marginal radiate female florets.

21a. Laminae of marginal female florets minute, inconspicuous, shorter than style ........................ 9. *S. graciliflorus*

21b. Laminae of marginal female florets obvious, at least 4 mm, longer than style.

22a. Achenes, at least of disk florets, pubescent, or at least with few hairs.

23a. Plants subscapose; stem leaves small and bractlike in comparison to radical leaves.

24a. Basal leaves long petiolar .................................................. 44. *S. analogus*

24b. Basal leaves sessile.

25a. Involucres 3–4 × 2–4 mm ..................................................... 42. *S. obtusatus*

25b. Involucres 5–7 × 5–8 mm.

26a. Leaves elliptic, oblong-lanceolate, or spatulate, margin with repand-denticulate teeth, adaxially glabrous ........................................................ 41. *S. spathiphyllum*

26b. Leaves obl-long-lanceolate, margin pinnatifid or subpinnatipartite, thinly
arachnoid-tomentose ........................................................................ 48. *S. nudicaulis*

23b. Plants with leafy stems; stem leaves well developed.
27a. Stems scandent or subscandent.
28a. Leaves petiolate; plants truly scandent; synflorescence branches and peduncles widely divaricate. 57. *S. scandens*
28b. Leaves sessile, subamplexicaul; plants scrambling; synflorescence branches and peduncles ascending.
29a. Leaves pinnately lobed ................................................. 55. *S. fikienensis*
29b. Leaves all or mostly subentire or dentate.
30a. Leaf blade ovate-lanceolate to narrowly oblong-lanceolate, laxly pilose or glabrous .......... 54. *S. stauntonii*
30b. Leaf blade lanceolate to linear, asperulous or hispid, especially abaxially .................. 52. *S. asperifolius*
27b. Stems erect.
31a. Phyllaries 5 or 6; ray florets 2 ................................................................. 35. *S. biligulatus*
31b. Phyllaries at least 8, usually 12–22; ray florets 5 or more.
32a. Leaves all or mostly unlobed, subentire, or dentate.
33a. Lower and median stem leaves long petiolate.
34a. Phyllaries leathery; ray lamina ca. 8 mm ........................................ 19. *S. coriaceisquamus*
34b. Phyllaries herbaceous; ray lamina 10–12 mm .......................... 56. *S. tarokoensis*
33b. Lower and median stem leaves shortly petiolate or subsessile.
35a. Leaves auriculate, subamplexicaul ... 54. *S. stauntonii*
35b. Leaves not auriculate.
36a. Leaves papery, asperulous, margin remotely dentate or subentire and revolute; capitula arranged in elongate thyroide cymes; involucres 7–9 mm ........................................ 52. *S. asperifolius*
36b. Leaves membranous, sparsely finely pubescent, margin closely dentate and flat; capitula arranged in spreading compound cymes; involucres 4.5–6 mm .......... 6. *S. morrisonensis*
32b. Leaves bipinnately, pinnately, or lyrate lobed.
37a. Stems weak, subscandent; median stem leaves 3–5 cm, lobes entire .... 55. *S. fikienensis*
37b. Stems stout, erect; median stem leaves 6–30 cm, lobes dentate.
38a. Stem leaves basally not auriculate, not subamplexicaul.
39a. Ray florets 8–12; lower and median stem leaves petiolate, petioles 3–8 cm .......... 56. *S. tarokoensis*
39b. Ray florets 5 (or 6); lower and median stem leaves subsessile, or if petiolate then petioles not exceeding 2 cm.
40a. Involucres 4.5–6 mm; stem leaves serrate to serrate-lobulate or deeply pinnately lobed ................................................................. 6. *S. morrisonensis*
40b. Involucres 8–10 mm; stem leaves very deeply and narrowly bipinnately or tripinnately lobed ........................................................................ 7. *S. kuanshanensis*
38b. Stem leaves basally with dentate or laciniate subamplexicaul auricles.
41a. Ray florets absent or 5; phyllaries 8 or 9 .................................................. 40. *S. diversipinnus*
42a. Involucres 3–4 × 3–4 mm; pappus straw-colored or pale brownish ............ 44. *S. analogus*
42b. Involucres 5–8 × 5–10 mm; pappus white.
43a. Ray lamina ca. 12 mm; involucres 7–8 × 6–10 mm; pappus persistent in all florets ... 49. *ambraeus*
43b. Ray lamina 8–10 mm; involucres 5–6 × 5–7 mm, pappus deciduous in ray florets ...... 51. *S. jacobaea*
22b. Achenes all glabrous.
44a. Capitula pendulous, peduncles cernuous.
45a. Leaves abaxially white tomentose.
46a. Involucres 5–6 × 3–5 mm; ray florets 6–8 .................................................. 24. *S. drakensis*
46b. Involucres 7–8 × 10–15 mm; ray florets 18–21 ........................................ 23. *S. nodiflorus*
45b. Leaves abaxially green, both surfaces glabrous.
47a. Basal and lower leaves present at anthesis, leaf blade flat, with 5 pairs of lateral veins;
phyllaries 17, fulvous pubescent; ray florets 18 .................................................. 22. *S. atrofuscus*
47b. Basal and lower leaves withered at anthesis, leaf blade revolute when dry, with 2 or 3 pairs of lateral veins; phyllaries 15, glabrous; ray florets 8–11 ........................................ 25. *S. daochengensis*
44b. Capitula and peduncles erect or ascending.
48a. Basal and lower stem leaves basally cordate or hastate, margin not pinnately lobed, present at anthesis.
49a. Ray lamina 15–22 × ca. 1 mm.
50a. Involucres 6–7 × 2–3 mm; phyllaries 8; ray florets 3, lamina ca. 15 mm ....................... 21. *S. lingianus*
50b. Involucres 8–10 × 3–5 mm; phyllaries 10–13; ray florets 4, lamina 20–22 mm .......... 20. *S. arachnanthus*
49b. Ray lamina shorter and comparatively broader, 4–10 mm.
51a. Plants 10–25 cm tall; capitula 3–5; phyllaries 15–18, with dark margins ........................ 33. *S. dodrans*
51b. Plants 40–100 cm tall; capitula numerous; phyllaries 6–8 or 10–13, without dark margins.
52a. Lower stem leaves triangular, basally deeply cordate; ray florets 3, lamina ca. 4 mm .................. 34. S. actinotus
52b. Lower stem leaves ovate or ovate-oblong, basally weakly cordate; ray florets 10–13, lamina ca. 6.5 mm .................................................. 44. S. analogus

48b. Basal and lower stem leaves basally broadly cuneate to attenuate, margin unlobed or pinnatisect, lyrate-pinnatisect, or runcinate, present or withered at anthesis.

53a. Pappus absent in ray florets.
53b. Pappus present in ray florets.

54a. Disk florets without a pappus ............................................................................................................. 47. S. echaetus
54b. Disk florets with a pappus.

55a. Stem leaves undivided, serrate-dentate, 5–10 cm .......................................................... 53. S. wightii
55b. Stem leaves lyrate-pinnatisect or lyrate-pinnatifid, median ones 10–22 cm.

56a. Involucres 5–7 × 4–10 mm; ray lamina ca. 8 mm, pappus reddish brown ...................... 46. S. raphanifolius
56b. Involucres 3–4 × 3–4 mm; ray lamina ca. 6.5 mm; pappus straw-colored or pale brownish ... 44. S. analogus

57a. Peduncles hollow and expanded below capitula; achenes 7–8 mm ...........................................  2. S. pseudoarnica
57b. Peduncles slender; achenes 2–5 mm.

58a. Leaves lanceolate, closely regularly denticulate, abaxially densely white tomentose ............  4. S. densiserratus
58b. Leaves not as above.

59a. Plants subscapose; stem leaves small and practicile in comparison to basal ones.
60a. Median stem leaves linear-lanceolate to linear, basally expanded, glabrous .................. 41. S. spathiphyllus
60b. Median stem leaves oblong or oblong-lanceolate, lyrate-pinnatifid, basally auriculate-amplexicaul with toothed or lobed auricles, ± tomentose.

61a. Capitula numerous; involucres 3–4 mm; ray florets 10–13, lamina ca. 6.5 mm .................. 44. S. analogus
61b. Capitula 2–6; involucres ca. 8 mm; ray florets 16–21, lamina 10–11 mm ..................... 45. S. tibeticus

59b. Plants with leafy stems; stem leaves well developed.
62a. Shoots dwarf, 2–20 cm tall; capitula 1–10 in each synflorescence; median stem leaves 2.5–4 cm; upper stem leaves with small entire auricles or not auriculate.
63b. Capitula smaller, few corymbose; involucres less than 10 mm wide, basally 4–8-calyculate; ray florets fewer than 10.

64a. Phyllaries 13; involucres 4–8 × 3–6 mm.
65a. Involutecres 4–5 × 3–4 mm; ray florets 5 or 6, lamina ca. 4 mm ......................... 30. S. kongboensis
65b. Involucres 6–8 × 5–6 mm; ray florets ca. 10, lamina 5–6 mm ..................... 27. S. thianschanicus
64b. Phyllaries 18–21; involucres 8–10 × 6–8 mm.
66a. Plants 2–6 cm tall; ray lamina ca. 7.5 mm .......................................................... 29. S. lhasaensis
66b. Plants 8–20 cm tall; ray lamina 10–12 mm ............................................. 26. S. albopurpureus

62b. Shoots more robust, 30–150 cm tall; capitula numerous in each synflorescence, or if plant shorter and with few capitula per synflorescence then upper stem leaves with coarsely dentate auricles.

67a. Stem leaves unlobed, dentate.
68a. Leaf petioles basally with minute auricles; pappus straw-colored .................. 3. S. cannabifolius
68b. Leaf petioles without auricles; pappus white.

69a. Ray florets 8–10, lamina 11–13 mm; involucres 6–7 × 4–5 mm ...................... 5. S. nemorensis
69b. Ray florets 5 or 6, lamina 8–9 mm; involucres 4.5–6 × 2–4 mm ................... 6. S. morrisonensis

67b. Stem leaves at least lower ones bipinnately, pinnately, or runcinately lobed.

71a. Leaf blade of lower and median stem leaves basally cuneate, narrowly decurrent to petiole, 11–30 × 4–15 cm, with 2 or 3 ascending, oblong-lanceolate, serrulate lateral lobes on each side .......................................................... 3. S. cannabifolius
71b. Leaf blade and lateral lobes of lower and median stem leaves not as above.

72a. Median stem leaves runcinate, with large terminal lobe, 1 or 2 pairs of lateral lobes, and largest lateral lobes uppermost; involucres 1.5–2 mm wide; ray florets 3 or 4 .................................................. 36. S. faberi
72b. Median stem leaves pinnatisect, with small terminal lobe, 3–12 pairs of lateral lobes, and largest lateral lobes at or below middle, or if leaves ± lyrate with large terminal lobe then involucres 3–4 mm wide and ray florets 8–13.

73a. Lateral lobes of median and upper stem leaves 8–12 on each side.
74a. Involutecres 6–9 mm; ray lamina ca. 7 mm .................................................. 10. S. multilobus
74b. Involucres 3–4 mm; ray lamina ca. 4.5 mm .................................................. 38. S. pteridophyllus
73b. Lateral lobes of median and upper stem leaves 3–6 on each side.

75a. Involucres 7–8 mm; ray lamina ca. 6 mm; pappus ca. 6 mm .......................... 12. S. cinarifolius

75b. Involucres 3–5 mm; pappus 4–4.5 mm.

76a. Involucres campanulate; pappus straw-colored or pale brownish; median stem leaves lyrate-pinnatifid; ray lamina ca. 6.5 mm; roots not tomentose ... 44. S. analogus

76b. Involucres narrowly campanulate-cylindric; pappus white; median stem leaves pinnatifid; ray lamina ca. 4 mm; roots tomentose .......................... 13. S. royleanus

70b. Phyllaries 12–22, usually 13 or 21.

77a. Plants with elongated, well-developed stolons ................................................................... 37. S. filifer

77b. Plants not stoloniferous.

78a. Stem leaves petiolate, not auriculate .................................................................... 6. S. morrisonensis

78b. Stem leaves sessile, with basal dentate or laciniate auricles.

79a. Capitula large, involucres 5–7 × 8–15 mm; ray lamina 9–12 mm ..................... 50. S. argunensis

80a. Pappus reddish brown, scant in ray florets, 4–5 mm ................................... 46. S. raphanifolius

80b. Pappus white, abundant on all florets, ca. 6 mm.

81a. Bracts of calyculus 10–12; ray lamina ca. 9 mm ................................ 43. S. multibracteolatus

81b. Bracts of calyculus 2–6; ray lamina ca. 12 mm ............................................ 49. S. ambraceus

82a. Basal and lower stem leaves lyrate, with comparatively large, broad, dentate terminal lobes ................................................................. 44. S. analogus

82b. Basal and lower stem leaves pinnatisect, with small, narrow terminal lobes.

83a. Involucres 5–6 × 6–7 mm; ray florets 10–13, lamina 8–9 mm ..................... S. kumaonensis

83b. Involucres 3–5 × 3–6 mm; ray florets 5–8, lamina 4–8 mm.

84a. Ray lamina ca. 4.5 mm; pappus ca. 4 mm ............................................ 38. S. pteridophyllus

84b. Ray lamina ca. 8 mm; pappus ca. 5.5 mm ........................................... 39. S. chungtienensis


羽脉千里光组  yu mai qian li guang zu


Herbs, perennial, erect, rather woody at base. Stems leafy. Leaves ovate or ovate-oblong, abaxially densely white arachnoid, base cordate or rounded-subtruncate. Capitula discoid, pendulous. Anthers basally short, rather obtusely, sagittate; antheropodia short, broad. Achenes with epidermal cells not papillose, cuticle thick; mechanical tissue in 10 closely approximate tracts, bi-allantoid (shaped like 2 sausages joined) in cross section.

One species: Bhutan, China, N India, Nepal.


须弥千里光  xu mi qian li guang

Cacalia penninervis H. Koyama; Koyamacalia penninervis (H. Koyama) H. Robinson & Brettell.

Herbs, perennial, with thick woody rhizome. Stem solitary or few fasciculate, erect, 50–90 cm tall, rather woody at base, sparsely arachnoid and shortly crisped-pubescent, not branched below synflorescence. Radical and lower stem leaves withered and shed by anthesis; median stem leaves long petiolate; petiole 3–6 cm, not winged; blade ovate or ovate-oblong, 10–13 × 4–5.5 cm, papery, abaxially densely white arachnoid-tomentose, adaxially at first sparsely arachnoid and shortly crisped-pubescent, pinnately veined with 14–18 arcuate lateral veins, base weakly cordate, margin macronulate-dentate, apex acute to obtuse, ± acuminate, macronulate. Upper leaves smaller and narrower upward, lanceolate, base cuneate. Capitula discoid, pendulous, numerous, arranged in narrow terminal and upper axillary panicles; peduncles 3–8 cm, shortly crisped-pubescent. Involucres cylindric, 7–8 × 2–3 mm, calyculate; bracts of calyculus ca. 3, linear; phyllaries 5( or 6), narrowly oblong, 6–7 × ca. 1 mm, herbaceous, sparsely puberulent, inconspicuously 3-veined, apically obtuse and puberulent. Florets 5–7; corolla yellow, ca. 6 mm, with ca. 2 mm tube and funnelform limb; lobes ovate-oblong, ca. 1 mm, apically acute. Anthers ca. 2.2 mm, basally obtuse-auriculate, appendages ovate-lanceolate. Style branches ca. 1 mm. Achenes cylindric, 2–3 mm, glabrous. Pappus dirty white, 4–5 mm. Fl. Jun–Aug.

Shaded slopes; 3600–4500 m. S Xizang (Gyirong) [Bhutan, N India, Nepal].


番红菊组  fan hong ju zu

Herbs, perennial, erect, with leafy stems. Leaves cuneate to attenuate at base. Capitula radiate, erect. Anthers obtuse to rounded at base. Achenes epidermal cells not papillose, cuticle thin; mechanical tissue in 9 or 10 contiguous tracts, forming a complete cylinder.

Maybe ca. 100 species: temperate to tropical Africa, Asia, Europe; 51 species (34 endemic) in China.


Leaves sessile, subamplexicaul. Peduncles robust, dilated toward apex. Capitula and achenes large.

One species: Aleutian Islands, China, Japan, Russia (Far East), North America.

2. Senecio pseudoarnica Lessing, Linnaea 6: 240. 1831 [“Pseudo-Arnica”].


Herbs, perennial, with short, thick rhizomes. Stem solitary, erect or ascending, 35–70 cm tall, hollow, simple, sparsely arachnoid, puberulent. Radical and lower stem leaves soon withering; median stem leaves sessile, ovate-oblong, oblong, elliptic, or obovate-oblong, 12–20 × 4.5–5.5 cm, thickly papery, abaxially paler and sparsely arachnoid, adaxially glabrous, narrowly veined, with 10–14 arcuate lateral veins, base cuneate-attenuate and subamplexicaul, margin coarsely mucronulate-dentate, apex obtuse. Upper leaves smaller, basally more rounded. Capitula 3.5–4.5 cm in diam., 2–20 in lax terminal corymbs; peduncles 1.5–3.5 cm, thick, usually dilated at apex, sparsely arachnoid and pubescent, bracteolate; bracteoles linear or linear-filiform, 5–15 mm. Involucres broadly campanulate or subhemi-spheric, 10–15 × 12–17 mm, calyculate; bracts of caly-culus 8, narrowly linear, ca. equaling phyllaries; phyllaries 20 or 21, oblong or narrowly oblong, 10–15 × ca. 3 mm, herba-ceous, sparsely puberulent, margin broadly scarious, apically acuminate and ciliate. Ray florets 15–17(–24); corolla tube 5–6.5 mm; lamina yellow, elliptic-oblong, 13–15 × 3–5 mm, 9-veined, apically obtuse, 3-denticulate. Disk florets many; corolla yellow, ca. 8 mm, with ca. 4 mm tube and funnelform limb; lobes ovate-oblong, ca. 1.7 mm, apically acute, puberulous. Anthers ca. 2.5 mm, basally shortly obtuse-auculiculate; appendages ovate; antheropodia short, broad. Style branches ca. 1.5 mm. Achenes cylindric, 7–8 mm, glabrous. Pappus dirty white, fultuous tinged at base, ca. 8 mm. Fl. Aug.–Sep. 2n = 40.

Seashores; sea level. Heilongjiang [N Japan, Russia (Far East); Aleutian archipelago, subarctic North America].


麻叶千里光系 ma ye qian li guang xi


One species: Aleutian Islands, China, Japan, Korea, Mongolia, Russia (Far East, E Siberia).


麻叶千里光 ma ye qian li guang

Herbs, perennial, rhizomatous. Stem solitary, erect, 1–2 m tall. Radical and lower stem leaves withered by anthesis. Median stem leaf petioles short, base auriculate; auricles circular or semicircular, small; blade abaxially pale green, adaxially dark green, obl ong-lanceolate, 11–30 × 4–15 cm, margin undivided or pinnately divided into 5–7 lobes, papery, abaxially crisped-puberulent, adaxially glabrous, base cuneate, margin serrate, apex acuminate; terminal lobe large, oblong-lanceolate, apex acute-acuminate; upper leaves 3-partite or undivided, gradually smaller upward. Capitula radiate, numerous, arranged in broad terminal compound corymbs; peduncles 10–20 mm, slender; bracteoles 2 or 3, linear, 2–3 mm, sparsely puberulent. Involucres cylindric, 5–6 × 2–3 mm, calyculate; bracts of calyculus 3 or 4, linear; phyllaries 8–10, oblong-lanceolate, ca. 5 × 1.5 mm, herbaceous, sparsely puberulent or subglabrous, margin broadly scarious, apically acute and puberulent. Ray florets 8–10; corolla tube ca. 3 mm; lamina yellow, ca. 10 × 2.5 mm, 4-veined, 3-denticulate. Disk florets ca. 21; corolla yellow, ca. 8 mm, with ca. 4 mm tube and funnelform limb; lobes ovate-lan-ceolate, ca. 1.5 mm, apically acute, puberulous. Anthers 2–3 mm, basally shortly, rather obtusely, sagittate; appendages ovate-lanceolate; antheropodia rather long and narrow, basally dilated. Style branches ca. 1.5 mm. Achenes cylindric, 3.5–4 mm, glabrous. Pappus straw-colored, ca. 6 mm. Fl. Jul. 2n = 40.

Meadows, forests. Hebei, Heilongjiang, Jilin, Nei Mongol [Japan, Korea, Mongolia, Russia (Far East, E Siberia); Aleutian archipelago].

1a. Leaves pinnately lobed ..................... 3a. var. cannabifolius
1b. Leaves unlobed, obl ong-lanceolate .... 3b. var. integrifolius
3a. Senecio cannabifolius var. cannabifolius

麻叶千里光(原变种) ma ye qian li guang (yuan bian zhong)

**密齿千里光系 mi chi qian li guang xi**

Herbs, tall, with leafy stem. Leaves unlobed, narrowly lanceolate or linear-lanceolate, densely denticulate, abaxially white tomentose; antheropodia rather elongated, somewhat dilated below middle.

- One species: China.


**密齿千里光 mi chi qian li guang**

Herbs, perennial, rhizomatous. Stem solitary, erect, 70–120 cm tall, simple below synflorescence, sparsely arachnoid-tomentose, glabrescent. Basal and lower stem leaves withered by anthesis; median stem leaves numerous, shortly petiolate; blade adaxially green, narrowly lanceolate or linear-lanceolate, 7–16 × 1–2 cm, papyraceous, abaxially white tomentose except for midvein, adaxially apressed pubescent, pinnately veined, lateral veins 18–22, obscure, base cuneately attenuate into petiole, margin densely denticulate, apex acute-acuminate-attenuate. Upper leaves smaller; uppermost leaves linear, small. Capitula radiate, numerous, arranged in terminal and upper axillary compound corymbs; peduncles 3–5 mm, slender, densely puberulent, with 2 or 3 filiform bracteoles. Involucres cylindric-campanulate, ca. 5 × 1.5–2.5 mm, calyculate; bracts of calyculus ca. 3, filiform, 1–2 mm; phyllaries 8, linear, ca. 5 × 0.5–0.8 mm, herbaceous, pubescent, margin narrowly scarious, apically acute, puberulent and sometimes purplish. Ray florets 5; corolla tube ca. 3 mm; lamina oblong, ca. 4 × 0.7 mm, 4-veined, 3-denticulate. Disk florets 7–9; corolla yellow, ca. 6 mm, with ca. 3 mm tube and funnelform limb; lobes ovate-triangular, ca. 1 mm, apically acute, papillose. Anthers ca. 1.5 mm, basally shortly obtuse-auriculate, appendages ovate-lanceolate, apically obtuse; antheropodia rather elongate, somewhat dilated in lower half. Style branches ca. 1 mm. Achenes cylindric, ca. 3 mm, glabrous. Pappus white, ca. 5 mm. Fl. Aug–Sep.

- Upland valleys; 2400–3000 m. Gansu, ?Shaanxi, Sichuan (Guanxian, Heishui).


**林荫千里光 lin yin qian li guang**

**Senecio gampensis Vaniot; S. kematogensis Vaniot; S. nemorensis var. octoglossus (Candolle) Ledebour; S. nemorensis var. subinterger H. Hara; S. nemorensis var. taiwanensis (Hayata) Yamamoto; S. octoglossus Candolle; S. octoglossus var. macer Candolle; S. saracenicus Linnaeus, p.p.; S. taiwanensis Hayata; S. tozanensis Hayata.**

Herbs, perennial, rhizomatous. Stems solitary or sometimes several, erect, to 1 m tall, not branched below synflorescence, sparsely pubescent or subglabrous. Basal and lower stem leaves withered by anthesis; median stem leaves numerous, subssisile, lanceolate or oblong-lanceolate, 10–18 × 2.5–4 cm, papery, both surfaces sparsely puberulent or subglabrous, pinnately veined, lateral veins 14–18, base cuneately attenuate and ± subamplexicaul, margin densely serrate, rarely coarsely dentate, apex acute-acuminate or acuminulate; upper leaves somewhat smaller. Capitula radiate, numerous, arranged in terminal and upper axillary compound corymbs; peduncles 1.5–3 cm, slender; bracteoles 3 or 4, linear, 5–10 mm, sparsely pubescent. Involucres subcylindric, 6–7 × 4–5.5 mm, calyculate; bracts of calyculus 3 or 5, linear, shorter than involucre; phyllaries 12–18, oblone, 6–7 × 1–2 mm, herbaceous, puberulent, margin broadly scarious, puberulent, apically triangular-acuminate and brown puberulent. Ray florets 8–10; corolla tube ca. 5 mm; lamina yellow, linear-oblong, 11–13 × 2.5–3 mm, 4-veined, 3-denticulate. Disk florets 15 or 16; corolla yellow, 8–9 mm wide, with 3.5–4 mm tube and funnelform limb; lobes ovate-trian-
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gular, ca. 1 mm, apically acute, papillose. Anthers ca. 3 mm, basally auriculate, appendages ovate-lanceolate; antheropodium rather short. Achenes cylindric, 4–5 mm, glabrous. Pappus white, 7–8 mm. Fl. Jun–Dec. 2n = 40.

Open places in forests, meadows, stream-sides; 700–3000 m. Anhui, Fujian, Gansu, Guizhou, Hebei, Henan, Hubei, Jilin, Nei Mongol, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang, Zhejiang [Japan, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Russia (Far East, Siberia); Europe].


玉山千里光

Herbs, perennial, rhizomatous. Stem solitary, erect, 30–60 cm tall, not branched below synflorescence or branching from near base, glabrous. Basal and often also lower stem leaves withered by anthesis; stem leaves numerous, subsessile or shortly petiolate; leaf blade broadly lanceolate to oblong-lanceolate, 7–14 × 1.3–3.5 cm, papery, glabrous, base cunetate-attenuate, margin unlobed and rarely serrate or usually coarsely serrate-lobulate or coarsely dentate, or deeply pinnately lobed, with 8–10 oblons, irregularly mucronulate-lobulate lateral lobes, apex acute-acuminate or acuminate-attenuate; upper leaves smaller. Capitula radiate, numerous, arranged in terminal or terminal and upper axillary corymbs; peduncles 1–2 cm; bracteoles 2 or 3, linear, 2–3 mm, sparsely pubescent or subglabrous. Involucres subcylindric, 4.5–6 × 2–4 mm, calyculate; bracts of calyculus 4 or 5, linear, ca. 1.5 mm; phyllaries usually 13, oblong, 0.5–1 mm wide, herbaceous, glabrous, margin narrowly scarious, apically triangular-acuminate, subobtuse, purplish and puberulent. Ray florets 5 or 6; corolla tube ca. 4.5 mm; lamina yellow, 8–9 × ca. 1.5 mm, 4-veined, 3-denticulate. Disk florets 14 or 15; corolla yellow, 6–6.5 mm, with 3.5–4 mm tube and funnelform limb; lobes oblong-lanceolate, ca. 1.5 mm, apically acute, papillose. Anthers ca. 2.5 mm, basally shortly obtuse-auriculate, appendages ovate-lanceolate; antheropodia rather broad, basally gradually dilated. Achenes cylindric, ca. 3 mm, sparsely hirtellous to subglabrous. Fl. Jun–Oct.

- Forests, forest margins, mountain slopes; 1600–3300 m. Taiwan.

6a. Senecio morrisonensis var. morrisonensis

玉山千里光 (原变种)

Senecio taitungensis S. S. Ying.

Leaves pinnatifid to pinnatipartite into narrow often coarsely lobulate lobes.

- Forests, rocky riverbeds; 2000–3300 m. Taiwan.

Senecio taitungensis represents a subscape variet of S. morrisonensis var. morrisonensis (into which it intergrades), inhabiting exposed places at 2000–3000 m.


齿叶玉山千里光

Herbs, perennial, rhizomatous. Stems solitary, erect, 32–44 cm tall, branching in upper part, glabrous. Basal and lower stem leaves withered by anthesis; stem leaves numerous, shortly petiolate; petiole 1–2 cm; median stem leaf blade broadly lanceolate, 11–13 × 3.5–5 cm, papery, glabrous, very deeply and narrowly bipinnately or tripinnately lobed, lobes spreading, lanceolate to linear, margin coarsely dentate or incised, apex attenuate, acute; upper leaves smaller, linear-lanceolate to linear, remotely dentate. Capitula radiate, numerous, in lax terminal corymbs; peduncles 3–7 cm, slender, sparsely pubescent or glabrous; bracteoles 1–3, linear, 2–3 mm, sparsely pubescent or subglabrous. Involucres subcylindric, 8–10 × 4–6 mm, calyculate; phyllaries usually 13, linear, 0.5–1 mm wide, herbaceous, glabrous, margin narrowly scarious, apically acute to subobtuse, puberulent. Ray florets 5( or 6); corolla tube ca. 8.5 mm; lamina yellow, 9–14 × ca. 3.5 mm, 4-veined, 3-denticulate. Disk florets 14 or 15; corolla yellow, 7–8 mm, with 4–5 mm tube and funnelform limb; lobes oblong-lanceolate, 1–1.5 mm, apically acute, papillose. Anthers ca. 2.5 mm, basally shortly auriculate, appendages ovate-lanceolate. Achenes cylindric, 2–3 mm, sparsely hirtellous on ribs. Pappus white, ca. 7.5 mm. Fl. Aug–Oct.

- Forests, bamboo thickets; 2500–3300 m. Taiwan.


西南千里光

Herbs, perennial, rhizomatous. Stems somewhat flexuous, erect, to 120 cm tall, simple or branched in upper part, puberulent when young. Basal and lower leaves withered by anthesis; median stem leaf petioles 2–3 cm, not winged, basally somewhat expanded; blade ovate-oblong or oblong-lanceolate, 15–20 × 4–6 cm, papery, sparsely shortly adpressed pubescent adaxially and on veins abaxially, midvein and veins prominent abaxially, pinnately partite into a lanceolate, acute, acuminate, or attenuate terminal lobe and ca. 10 oblong-lanceolate to subrhombic, irregularly dentate-mucronulate or lacerate-mucronulate lateral lobes, basally ± cuneate. Upper leaves smaller, with
fewer lateral lobes. Uppermost leaves shortly petiolate or subsessile; blade linear or linear-lanceolate, margin sharply serrate, apically acuminately attenuate. Capitula discoid, few to many in lax terminal and upper axillary thyroid corymbs; peduncles 3–5 mm, densely fulvous puberulent; bracteoles 2 or 3, subulate. Involucres cylindric or narrowly campanulate, 8–10 × 2–4 mm, calyculate; bracts of calyculus 3 or 4, subulate; phyllaries 8, purplish, linear or linear-lanceolate, ca. 1 mm wide, subleathery, sparsely puberulent, margin narrowly scarious, apically obtuse, purplish and sparsely puberulent. Disk florets 10–12; corolla red or purple, ca. 10 mm, 4–5 mm tube and funnelform limb; lobes ovate-triangular, ca. 1.2 mm, apically acute, papillose. Anthers yellow, ca. 3 mm, basally shortly obtuse-auriculate, appendages ovate-lanceolate; antheropodium rather short, somewhat dilated in lower half. Style branches ca. 1 mm. Achenes (immature) ca. 2.5 mm, glabrous. Pappus white, 6–7 mm. Fl. Aug.–Sep.

Montane slopes, shaded places in valleys, among bamboo; 1700–3200 m. Guizhou, Sichuan, Yunnan.


纤花千里光 xian hua qian li guang

Senecio graciliflorus var. pleopterus (Diels) Handel-Mazzetti; S. mairei H. Léveillé; S. pleopterus Diels.

Herbs, perennial, rhizomatous. Stem solitary, erect, 50–120 cm tall, branching in upper part, sparsely pubescent when young, glabrescent. Leaves petiolate, radical and lower stem leaves withered by anthesis; median stem leaf petiole 2–4.5 cm, slender, basally somewhat dilated but not auriculate; blade ovate or ovate-oblong, 10–25 × 6–12 mm, pinnatifid into an oblong-lanceolate, acuminate or acuminate-caudate terminal lobe and 8–10 oblong-lanceolate, long acuminate, coarsely serrate lateral lobes, papery, sparsely shortly adpressed pubescent adaxially and especially on main veins abaxially. Upper leaves smaller, less deeply divided and with fewer lateral lobes. Capitula obscurely radiate, numerous, arranged in terminal and upper axillary compound corymbs; peduncles 3–5 mm, slender, linear-bracteolate, densely fulvous puberulent. Involucres narrowly cylindric, 8–9 × 1.5–2 mm, calyculate; bracts of calyculus 4 or 5, linear-subulate, 2–3 mm, puberulent; phyllaries 5, linear, ca. 8 × 1 mm, herbaceous, sparsely minutely puberulent, obscurely 3-veined, margin narrowly scarious, apically obtuse and puberulent. Ray florets 1 or 2; corolla yellow, filiform, apically truncate or with a minute lamina much shorter than style branches. Disk florets 3; corolla yellow, ca. 8 mm, with ca. 3.5 mm tube and funnelform limb; lobes ovate-triangular, ca. 1 mm, apically acute, papillose. Anthers ca. 2.2 mm, basally obtuse-auriculate or sagittate, appendages ovate-lanceolate; antheropodia rather broad, basally slightly dilated. Style branches ca. 1.8 mm. Achenes cylindric, ca. 2.5 mm, glabrous. Pappus white, 4–5 mm. Fl. May–Oct. 2n = 40.

Open places in forests, forest margins, grassy slopes, streamsides; 2000–4100 m. Guizhou, Sichuan, Xizang, Yunnan [India (Sikkim), Kashmir, W Malaysia].


多裂千里光 duo lie qian li guang

Herbs, perennial. Stem solitary, erect, to 150 cm tall, fistulose, sparsely puberulent, glabrescent, not branched below, much branched into synflorescence in upper part. Basal and lower stem leaves petiolate; blade abaxially pale green, adaxially dark green, oblong-lanceolate, 10–15 × 5–6 cm, abaxially sparsely minutely pilose on veins, adaxially sparsely puberulent, pinnatifid into small, linear-lanceolate, acuminate, entire or obscurely denticulate terminal lobe and 20–26 opposite or subopposite, narrowly oblong or oblong-lanceolate, 2–3 × 0.5–0.8 cm, spreading, acute, acutely few serrulate lateral lobes; upper leaves similar but smaller. Capitula radiate, very numerous, arranged in terminal and upper axillary compound corymbs; peduncles 5–12 mm, slender, puberulent; bracteoles 1 or 2, filiform, 1–2 mm, puberulent. Involucres cylindric, 6–7 × 2.5–3 mm, calyculate; bracts of calyculus 5 or 6, filiform; phyllaries 8 or 9, linear, 6–7 × ca. 0.8 mm, subleathery, glabrous, margin narrowly scarious, apically obtuse and puberulent. Ray florets 5; corolla tube ca. 4 mm; lamina orange-yellow, oblong, ca. 7 × 1–1.2 mm, 4-veined, 3-denticulate. Disk florets 10; corolla orange-yellow, ca. 8.5 mm, with ca. 3.5 mm tube and funnelform limb; lobes oblong-lanceolate, ca. 1 mm, apically acute, papillose. Anthers ca. 2.7 mm, basally shortly obtuse-auriculate, appendages ovate-lanceolate; antheropodium rather elongated, basally slightly expanded. Style branches ca. 1.5 mm. Achenes cylindric, ca. 2.5 mm, glabrous. Pappus white, ca. 7 mm. Fl. Sep.–Nov.

Forest and thicket margins; 2700–3000 m. Yunnan (Longchuan Jiang–Nu Jiang divide).


尖羽千里光 jian yu qian li guang

Herbs, perennial, rhizomatous. Stems solitary or few fasciculate, weakly trailing below, ascending to erect above, 60–150 cm tall, not branched below synflorescence, fulvous puberulent when young. Basal and lower stem leaves withered and shed by anthesis; median stem leaf petioles 2–2.5 cm, slender, glabrous, not auriculate; blade oblong-lanceolate, 4–10 × 2–4 cm, papery, abaxially pallid and sparsely puberulent on veins, adaxially subglabrous, runcinate-pinnatifid into a small linear-lanceolate, acute, terminal lobe and 14–20 oblong-lanceolate or lanceolate, acute, apically mucronulate, entire or obscurely denticulate, basally somewhat contracted lateral lobes; upper leaves smaller. Capitula discoid, numerous, arranged in terminal compound corymbs, crowded, nodding; peduncles 1–3 mm, slender, fulvous puberulent; bracteoles 2 or 3, linear-subulate. Involucres cylindric-campanulate, 6 × 1.5–2 mm, calyculate; bracts of calyculus 1 or 2, linear-subulate, ca. 2 mm; phyllaries 5, oblong-linear, ca. 6 × 1 mm, dark at apex and on upper margins, herbaceous, glabrous, margin narrowly scarious, apically obtuse. Disk florets 6; corolla orange-yellow, ca. 8 mm, with 3–3.5 mm tube and funnelform limb; lobes ovate-triangular, 1–2 mm, apically acute, papillose. Anthers linear, ca. 2 mm, basally shortly obtuse-auriculate, appendages ovate-lanceolate; antheropodium rather elongated, basally not dilated. Style branches ca. 1.2 mm. Achenes cylindric,
ca. 2.5 mm, glabrous. Pappus white, ca. 6.5 mm. Fl. Sep–Nov.

- Thicket margins; ca. 3300 m. Yunnan (Longchuan Jiang–Nu Jiang divide).


瓜叶千里光 gua ye qian li guang

Herbs, perennial, rhizomatous. Stem solitary, erect, 60–120 cm tall, simple, somewhat flexuous, adpressed puberulent when young; basal and lower stem leaves withered and shed by anthesis; median stem leaf petioles 1.5–2 cm, basally auriculate; auricle leaflike, irregularly serrate or lacerate, subamplexicaul; blade adaxially dark green, abaxially pale green, ovate-elliptic or ovate-oblong, to 16 × 9–10 cm, papery, abaxially sparsely puberulent on distinctly reticulate veins, adaxially sparsely shortly pubescent, pinnatifide into an oblong-lanceolate attenuate terminal lobe and 8–14 oblong or oblong-lanceolate, acuminate or attenuate, irregularly sharply serrate or lacerate lateral lobes. Upper leaves smaller, few, less deeply lobed; uppermost leaves linear-lanceolate or linear, margin shallowly toothed or subentire. Capitula radiate, numerous, arranged in rather dense terminal and upper axillary corymbs; peduncles 5–10 mm, densely fulvous puberulent, with 2 or 3 linear bracteoles. Involucres cylindrical or narrowly campanulate, 7–8 × 2–3 mm, prominently calyculate; bracts of calyculus 5 or 6, greener, linear, unequal, to 1/2 as long as involucre; phyllaries 8, oblong-lanceolate, ca. 1 mm wide, herbaceous, puberulent, margin narrowly scarios, apically obtuse, purplish and puberulent. Ray florets 5; corolla tube ca. 4 mm; lamina yellow, oblong, ca. 6 mm, 4-veined, 3-denticulate. Disk florets 15 or 16; corolla tube 8 or 9; corolla yellow, ca. 8 mm, with ca. 4 mm tube; lobes ovate-lanceolate, apically acute, papillose. Anthers ca. 2 mm, basally shortly obtuse-auriculate, appendages ovate-lanceolate; antheropodia elongate, gradually slightly dilated in lower half. Style branches ca. 1.2 mm. Achenes cylindric, ca. 2.5 mm, glabrous. Pappus white, ca. 6 mm. Fl. Aug–Sep.


珠峰千里光 zhu feng qian li guang

Senecio graciliflorus Candolle var. hookeri C. B. Clarke; S. tanacetoides Kunth & C. D. Bouché.

Herbs, perennial, rhizomatous. Stem solitary, erect, ca. 60 cm tall, ± flexuous in upper part, not branched below synflorescence, fulvous puberulent when young. Basal and lower stem leaves withered and shed by anthesis; median stem leaf petioles 1.5–3 cm, sparsely puberulent, without or with small, entire or toothed auricles; blade adaxially green, ovate-oblong, 10–15 × 6–8 cm, papery, abaxially sparsely puberulent on rather prominent veins, adaxially glabrous or sparsely puberulent, pinnatifid into a triangular-lanceolate, attenuate terminal lobe and 10–12 ovate-lanceolate or oblong-lanceolate, acuminate-attenuate, mucronulate-serrate lateral lobes. Upper leaves smaller, not auriculate. Uppermost leaves lanceolate or linear-lanceolate, basally cuneate, shortly petiolate or subsessile, margin unequally serrate, apically acuminatus or long acuminate. Capitula radiate, numerous, arranged in dense compound terminal and upper axillary corymbs; peduncles 3–5(–10) mm, slender, sparsely to densely puberulent, with 1–3 linear-subulate bracteoles. Involucres narrowly campanulate, 4.5–5 × 1.5–2.5 mm, calyculate; bracts of calyculus 5 or 6, linear, unequal, 1–3 mm; phyllaries 8, linear, ca. 1 mm wide, herbaceous, sparsely puberulent, margin narrowly scarious, apically obtuse, purplish and puberulent. Ray florets 4 or 5; corolla tube ca. 3.5 mm; lamina yellow, oblong, ca. 4 × 1 mm, 3- or 4-veined, 3-denticulate. Disk florets 8 or 9; corolla yellow, ca. 6 mm, with ca. 3 mm tube and funnelform limb; lobes 5, ovate-triangular, ca. 1 mm, apically acute, papillose. Anthers ca. 1.5 mm, basally obtuse-auriculate, appendages ovate-lanceolate; antheropodia moderately long, basally slightly dilated. Achenes cylindric, ca. 2.5 mm, glabrous. Pappus white, ca. 4.5 mm. Fl. Aug–Sep.

Grassy slopes, by streams; 2900–3600 m. Xizang (Yadong) [Bhutan, Kashmir, Myanmar].


革苞千里光 ge bao qian li guang xi

Herbs, with leafy stems. Leaves ± deltoid, abaxially not tomentose, basally cordate or hastate. Capitula disoid or rarely radiate, usually nodding. Phyllaries 5, 8, or 13, rarely 12 or 14, usually leathery. Ray florets absent or rarely 5–7. Disk florets 5 to many. Anthers shortly obtuse-auriculate or subauriculate at base; antheropodia rather short to elongated, basally hardly or somewhat dilated but not markedly so.

- Six species: China.


丽江千里光 li jiang qian li guang

Herbs, perennial, rhizomatous. Stems 1 or 2, erect, 30–40 cm tall, not branched, ± puberulent when young. Basal and lower stem leaves withered by anthesis; median stem leaves long petiolate; petiole 3–6 cm, glabrous, not winged, basally slightly expanded, not auriculate; blade abaxially pale green, triangular, 3–5 × 2–4 cm, membranous, abaxially glabrous, adaxially shortly scattered pilose or subglabrous, pinnately veined, base cordate or hastate, margin coarsely dentate, apically shortly obtuse-acuminate, mucronulate; upper leaves smaller. Uppermost leaves lanceolate or linear, margin remotely denticulate or subentire. Capitula disoid, nodding, solitary or rarely paired in axils of uppermost leaves, forming a terminal racemose cyme; peduncles cygneous, mostly shorter than subtending leaves, puberulent, not bracteolate. Involucres narrowly campanulate, 8–10 × 3–6 mm, calyculate; bracts of calyx 3 or 4, linear, less than 1/2 as long as involucre, apically obtuse;
phyllaries 8 or 9, rarely 13, oblong-linear or linear-lanceolate, 8–10 × 1–2 mm, herbaceous, puberulent or glabrous, margin narrowly scarious, apically subacute or obtuse and puberulent. Disk florets 15–18; corolla yellow, 7–7.5 mm, with ca. 3 mm tube and narrowly campanulate limb; lobes 5, ovate-triangular, ca. 1 mm, apically acute. Anthers ca. 2 mm, basally obtuse-auriculate; antheropodia rather short, basally somewhat dilated and rounded. Style branches ca. 0.8 mm. Achenes cylindric, ca. 4 mm, glabrous. Pappus white, ca. 6 mm. Fl. Sep.

- Montane meadows; 3000–3500 m. Sichuan (Muli), Yunnan (Lijiang).

15. Senecio tricuspidus Franchet, J. Bot. (Morot) 8: 357. 1894.

三尖千里光 san jian qian li guang

*Cacalia tricuspid* (Franchet) Handel-Mazzetti.

Herbs, perennial, rhizomatous. Stems 1 or 2, erect, 60–80 cm tall, simple, glabrous. Basal and lower leaves withered by anthesis; median stem leaves long petiolate; petiole 3–7 cm, slender, not winged, glabrous, not auriculate; blade broadly triangular, 5–8 × 3–5 cm, membranous, glabrous, pinnately veined, veins inconspicuous, base hastate, margin unequally coarsely dentate or subacerate in upper part and with 2–4 spreading, serrate-lacerate lateral lobes at base, apex acuminate-attenuate. Upper leaves shortly petiolate, similar but smaller upward. Capitula nodding, discoid, solitary, terminal and in axils of upper leaves, forming a lax terminal racemose cyme; peduncles erect, elongated, cygnetous at apex, usually exceeding leaves, sparsely puberulent, with 1 or 2 linear bracteoles. Involute campanulate, 8–10 × 7–9 mm, calyculate; bracts of calyculus 3 or 4, linear-subulate; phyllaries 12 or 13, ovate-lanceolate, ca. 8 × 1.5–2 mm, leathery or subleathery, glabrous, margin narrowly scarious, apically acutely acuminate and purplish. Disk florets many; corolla yellow, 7–8 mm, with 3–3.5 mm tube and funnelform limb; lobes ovate-oblong, 1–1.2 mm, apically acute, papillose. Anthers ca. 2.5 mm, basally shortly obtuse-auriculate, appendages ovate-lanceolate; antheropodia rather short, basally somewhat dilated. Style branches ca. 1 mm. Achenes cylindric, 4–5 mm, glabrous. Pappus white, ca. 6 mm. Fl. Sep.–Oct. 2n = 40*.

- Montane meadows; 3500–3800 m. Sichuan, Yunnan.


弥勒千里光 mi le qian li guang

Herbs, perennial, rhizomatous, stoloniferous. Stems solitary, erect, 60–70 cm tall, not branched below synflorescence, sparsely puberulent when young, soon glabrous. Basal and lower stem leaves withered by anthesis; median stem leaf petioles 3.5–12 cm, slender, narrowly expanded but not auriculate; blade deltoid, small, 2–3 × 2–3 cm, membranous, abaxially glabrous, adaxially sparsely puberulent or glabrous, base subtruncate or weakly cordate, margin irregularly sinuate-dentate, apex acuminate. Basal and lower stem leaves withered by anthesis; lower stem leaves with narrowly winged petioles, basally subauriculate. Median stem leaves similar but larger; petiole 3.5–6 cm, narrowly winged, basally auriculate; blade 5–15 × 4–8 cm, base subtruncate or hastate, pinnately veined. Upper leaves smaller, with shorter, broadly winged petioles, basally dilated into conspicuous rounded subamplexical auricles. Uppermost leaves sessile, lanceolate, basally cordate-semiamplexical, apically caudate-acuminate. Capitula at first erect, later nodding, discoid, numerous, arranged in dense long-stalked terminal and upper axillary rounded corymbs; peduncles 2–3 mm, fulvous puberulent; bracteoles 2 or 3, filiform. Involucres cylindric, 6–7 × 1.5–2 mm, calyculate; bracts of calyculus 2 or 3, minute; phyllaries 5, linear, ca. 1 mm wide, subleathery, glabrous, margin narrowly membranous, apically obtuse and black. Disk florets 5 or 6, corolla yellow, 6–7 mm, with 2–2.5 mm tube and funnelform limb; lobes ovate-triangular, 0.8–1 mm, apically acute, papillose. Anthers 2–2.5 mm, basally obtusely subauriculate, appendages lanceolate; antheropodia rather long, basally gradually dilated. Style branches ca. 0.7 mm. Achenes (immature) cylindric, ca. 1.5 mm, glabrous. Pappus deciduous, white, 5–6 mm. Fl. Sep.

- Montane woods and meadows; 2000–2400 m. Yunnan (Mile).


凉山千里光 liang shan qian li guang

*Senecio faberi* Hemsley var. *discoideus* Lauener & D. K. Ferguson; *S. milleflorus* H. Léveillé (1914), not Greene (1900).

Herbs, perennial, rhizomatous. Stem solitary, erect, 30–60 cm tall, not branched below synflorescence, sparsely puberulent when young, soon glabrous. Basal and lower stem leaves withered by anthesis; median stem leaf petioles 3.5–12 cm, slender, narrowly winged, basally expanded into a toothed, subamplexical auricle; blade narrowly deltoid, 6–15 × 3.5–8 cm, papery, glabrous, pinnately veined, lateral veins 10–14, veins rather prominent abaxially, base hastate with triangular-lanceolate lateral basal lobes, margin irregularly coarsely mucronulate-dentate, apex acuminate. Upper leaves smaller, with shorter, rather more broadly winged petioles and more conspicuous auricles. Uppermost leaves sessile, lanceolate-attenuate, base subamplexical, margin denticulate. Capitula soon pendulous, discoid, numerous, arranged in rather congested terminal corymbiform stalked clusters; peduncles 5–7 mm, slender, minutely puberulent; bracteoles 2 or 3, filiform. Involucres cylindric-campanulate, ca. 6 × 2–2.5 mm, calyculate; bracts of calyculus 3 or 4, linear-subulate, unequal; phyllaries 8, linear, ca. 1 mm wide, herbaceous, glabrous, margin narrowly scarious, apically obtuse, blackish and fimbriate. Disk florets 10; corolla yellow, ca. 6.5 mm, with ca. 3 mm tube and funnelform limb; lobes ovate-triangular, ca. 1 mm, apically acute, papillose. Anthers ca. 1.8 mm, basally shortly obtuse-auriculate, appendages ovate-lanceolate; antheropodia rather elongated, narrow, basally hardly dilated. Style branches ca. 0.8 mm. Achenes cylindric, ca. 3 mm, glabrous. Pappus white, ca. 6 mm. Fl. Aug–Sep.

- Montane woods and meadows; 2600–3400 m. SW Sichuan, Yunnan.
18. **Senecio nigrocinctus** Franchet, J. Bot. (Morot) 10: 417. 1896 ["*nigro-cinctus*"].

黑苞千里光  hei bao qian li guang

*Senecio delavayi* Franchet, J. Bot. (Morot) 8: 364. 1894, not Franchet (1892); *S. pteropodus* W. W. Smith.

Herbs, perennial, rhizomatous. Stems solitary, ascending then erect, 30–60 cm tall, puberulent when young, soon glabrous. Basal and lower stem leaves withered by anthesis, long petiolate; petiole 4–8 cm, not winged, basally expanded but not auriculate; blade ovate-triangular, 4–6 × 2.5–5 cm, papery, base cordate or hastate, margin coarsely sharply dentate, apex acute. Median stem leaves larger; petiole 3–5 cm, broadly winged, basally expanded into prominent subamplexicaul dentate auricle; blade ovate-triangular, 6–10 × 4–6 cm, otherwise similar, glabrous, pinnately veined, lateral veins 10–14. Upper leaves sessile; blade lanceolate or oblong-lanceolate, 4–9 × 1.5–3 cm, with auricle and petiolar wings confluent with blade, margin irregularly deeply dentate, apex long acuminate. Capitula at first erect, then nodding, discoid, numerous, arranged in terminal and upper axillary rather dense rounded corymbiform clusters; peduncles 5–12 mm, densely fulvous puberulent; bracteoles 1–3, linear. involucres obconic-campanulate, 6–7 × 2.5–4 mm, calyculate; bracts of calyculus 4 or 5, linear, unequal, 3–6 mm, apically acute, dark; phyllaries 8–13, spreading or reflexed in upper part, linear-lanceolate, 6–7 × 1–1.5 mm, leathery, puberulent to glabrous, apically acute-acuminate, dark at apex and on upper margin. Disk florets (13–)22–26; corolla yellow, ca. 7.5 mm, with ca. 4 mm tube and funnelform limb; lobes ovate-triangular, apically acute. Anthers ca. 2 mm, basally shortly obtuse-auriculate, appendages ovate-oblong; antheropodia elongated, basally gradually slightly dilated. Style branches ca. 1 mm. Achenes cylindric, ca. 2.5 mm, glabrous. Pappus white, ca. 5 mm. Fl. Jul.–Sep.


革苞千里光  ge bao qian li guang

Herbs, perennial, rhizomatous. Stems solitary or few fasciculate, ascending, flexuous, ca. 45 cm tall, crisped-pubescent. Petioles of radical leaves 2–2.5 cm, densely pilose, narrowly winged, basally expanded but not auriculate; blade of radical leaves triangular or ovate, 3–3.5 × 2.5–3 cm, papery, both surfaces densely crisped-pilose, pinnately veined, base cordate, margin entire or obscurely mucronulate-crenulate or denticulate, apex obtuse. Basal and lower stem leaves withered and shed by anthesis; median stem leaves similar; petiole 2–4 cm, winged, basally gradually dilated into conspicuous rounded entire or few-dENTICULATE subamplexicaul auricle; blade triangular or ovate-triangular, 4–6 × 2–4 cm. Uppermost leaves lanceolate, basally cuneate to petiole, apically acute-acuminate. Capitula erect, radiate, 5–10 in terminal rather dense corymbs; peduncles 5–20 mm, densely pubescent, bracteate at base, bracteole. Involucres campanulate, 8–9 × 4–5 mm, calyculate; bracts of calyculus 7 or 8, green, linear, 5–7 mm; phyllaries 12–14, ca. 8 × 1–1.5 mm, leathery, puberulent, margin narrowly subcartilaginous, apically acute, black. Ray florets 5–7; corolla tube 4.45 mm; lamina oblong, ca. 8 × 2.5 mm, 4-veined, apically 3-dENTICULATE or 3-lobed. Disk florets many; corolla yellow, ca. 8 mm, with ca. 4 mm tube and funnelform limb; lobes ovate-triangular, ca. 1.6 mm, marginally papillose, apically acute. Anthers ca. 2 mm, basally obtusely subauriculate, appendages ovate-oblong; antheropodia somewhat elongated, basally somewhat dilated. Style branches ca. 1.2 mm. Achenes (immature) cylindric, ca. 3.5 mm, puberulent. Pappus white, ca. 6 mm. Fl. May.

- Alpine meadows, by streams; ca. 3000 m. Yunnan (Longchuan Jiang–Nu Jiang divide).


狭舌千里光系  xia she qian li guang xi

Herbs, erect, tall, with leafy stems. Leaves ± deltoid, abaxially not tomentose, basally cordate or subhastate. Capitula radiate, erect. Phyllaries 8–12, ± leathery. Ray florets 3 or 4, lamina elongated, narrow. Disk florets 8–19. Anthers obtuse-auriculate at base; antheropodia rather short and broad, basally slightly or somewhat dilated but not markedly so.

- Two species: China.

20. **Senecio arachnanthus** Franchet, J. Bot. (Morot) 8: 355. 1894.

长舌千里光  chang she qian li guang

*Cacalia arachnantha* (Franchet) Handel-Mazzetti.

Herbs, perennial, rhizomatous. Stems solitary, erect, to 100 cm tall, not branched below synflorescence, puberulent when young. Leaves long petiolate, basal and lower stem leaves withered by anthesis; petiole to 24 cm, not winged, sparsely pubescent; blade broadly ovate, to 26 cm long and broad, membranous or thinly papery, abaxially sparsely shortly pilose, adaxially minutely pubescent on veins, pinnately veined, base deeply cordate or hastate, margin acutely irregularly coarsely dentate, apex acuminate-attenuate or acute. Median and upper stem leaves broadly triangular, basally broadly cordate, with shorter petioles not winged or winged and expanded and subamplexicaul. Uppermost leaves ovate-triangular or ovate-lanceolate, basally cuneate, shortly petiolute or subsessile. Capitula radiate, rather few to numerous, arranged in long stalked terminal compound corymbs; peduncles 6–10 mm, bracteate; bracteoles 3, linear, 5–10 mm, pubescent. Involucre cylindric, 8–10 × 3–5 mm, calyculate; bracts of calyculus 6–8, green, linear, ca. 1/3 as long as involucre; phyllaries 10–13, linear-lanceolate, ca. 8 × 1.5–2 mm, leathery, glabrous, margin narrowly scarious, apically obtuse to acute and finely ciliate. Ray florets 4; corolla...
tube ca. 7 mm, puberulent in upper part; lamina yellow, linear, 20–22 × 0.5–0.7 mm, 2- or 3-veined, apically 3-denticulate. Disk florets 17–19; corolla yellow, ca. 10 mm, with 5.5–6 mm tube and funnelform limb; lobes ovate-oblong, ca. 1.5 mm, apically acute, papillose. Anthers ca. 3.5 mm, basally obtuse-auriculate, appendages ovate-lanceolate; antheropodia rather broad, basally slightly expanded. Style branches ca. 1.2 mm. Achenes cylindric, ca. 3 mm, glabrous. Pappus pappus white, ca. 2 mm. Fl. Aug.–Sep.

- Wet places in forests, by springs, streams; ca. 3000 m. NW Yunnan (Dali, Heqing).


君范千里光 jun fan qian li guang


Herbs, perennial, rhizomatous. Stem solitary, erect, to 120 cm tall, branching into synflorescence, sparsely puberulent when young. Leaves petiolate; basal and lower stem leaves withered by anthesis; median stem leaf petiole 3–6 cm, narrowly winged; blade ovate-triangular or triangular, 10–14 × 8–13 cm, membranous or thinly papery, abaxially sparsely puberulent, adaxially glabrous, base broadly cuneate and attenuate into petiole, margin irregularly dentate, apex acuminate. Upper leaves smaller, subsessile, ovate-lanceolate or lanceolate, 9–11 × 1.5–3.5 cm, base cuneate-attenuate, apex acuminate. Capitula radiate, numerous, arranged in rather crowded terminal compound corymbs; peduncles 7–15 mm, slender, puberulent, often bracteate; bracteoles 2 or 3, linear, ca. 5 mm. Involucres subcylindric, 6–7 × 2–3 mm, calyculate; bracts of calyculus 2 or 3, linear, ca. 1/2 as long as involucre; phyllaries 8, linear-oblong, 6–7 × 1–1.5 mm, subleathery, glabrous, margin scarious, apically acute, blackish, and ciliate. Ray florets 3; corolla tube 4–5 mm, sparsely puberulent in upper part; lamina yellow, linear, ca. 15 × 1 mm, 4-veined, apically deeply 2- or 3-lobed. Disk florets 8 or 9; corolla yellow, ca. 8.5 mm, with ca. 4.5 mm tube and funnelform limb; lobes oblong-lanceolate, ca. 1.7 mm, apically acute. Anthers ca. 2.3 mm, basally shortly obtuse-auriculate, appendages ovate; antheropodia somewhat expanded toward base. Style branches ca. 1 mm. Achenes ca. 2.5 mm, glabrous. Pappus white, ca. 6 mm. Fl. Aug.–Sep.

- Open forests, alpine shrubby meadows; 3600–4000 m. Xizang (Bomi, Mêdog).


垂头千里光系 chui tou qian li guang xi

Herbs, erect, rather small, with leafy stems. Leaves ovate to oblong-lanceolate, abaxially glabrous or tomentose, basally subtruncate to attenuate. Capitula radiate, nodding. Phyllaries 5 or 6 or 17–20, subleathery or herbaceous. Ray florets 6–8 or 18–20. Disk florets 23 to many; corolla lobes dark colored at apices. Anthers obtusely or subacutely auriculate at bases; antheropodia robust, elongated, basally only slightly dilated.

- Four species: China.


黑褐千里光 hei he qian li guang

Herbs, slender, rhizomatous. Stem solitary, erect, 35–65 cm tall, simple, glabrous. Basal and lower stem leaves mostly present at anthesis; petiole to 15 cm, slender, basally expanded; blade ovate or ovate-oblong; 1–4 × 1–1.5 cm, membranous, minutely glandular ciliate on margin, otherwise glabrous, pinnately veined, base cordate to truncate or cuneate, margin remotely apiculate-denticulate, apex obtuse to acute. Median stem leaves sessile; blade oblong or oblong-lanceolate, 3–6–8) × 0.5–1.5 cm, base cuneate, apex acute. Upper leaves linear, basally subamplexicaul, margin mucronulate-dentate or subentire, apically acuminate or acute. Capitula 1–3, terminal, lax, nodding, 2–2.5 cm in diam.; peduncles 1.5–3.5 cm, sparsely arachnoid to subglabrous; bracteoles 1 or 2, linear. Involucres broadly campanulate, 6–8 × 6–10 mm, calyculate; bracts of calyculus 9–12, linear or linear-subulate, 4–5 mm, purple, sparsely arachnoid or glabrous, ciliate on margin, apically acute; phyllaries ca. 17, ca. 2 mm wide, subleathery, blackish on veins and upper margins, sparsely fuscous pubescent at base, 3-veined, margin narrowly scarious, apically acute and ciliate. Ray florets 18; corolla tube ca. 3 mm; lamina yellow, elliptic, 10–11 × ca. 4 mm, 4-veined, apically acute, 3-denticulate. Disk florets many; corolla yellow, 7–7.5 cm, with ca. 2.5 mm tube and funnelform limb; lobes ovate-triangular, ca. 1 mm, apically blackish, acute. Anthers ca. 2.2 mm, basally shortly obtuse-auriculate, appendages lanceolate; antheropodia elongated, robust, basally slightly dilated. Style branches ca. 1.5 mm. Achenes cylindric, ca. 3.5 mm, glabrous. Pappus white, 7–7.5 mm. Fl. Aug.

- Grassy slopes; ca. 3900 m. Xizang (Gongbo’gyamda), NW Yunnan.


节花千里光 jie hua qian li guang

Senecio drukensis C. Marquand & Airy Shaw var. nodiflorus (C. C. Chang) Handel-Mazzetti.

Herbs, rhizomatous. Stem usually solitary, erect, 10–50 cm tall, simple or branching into synflorescence, densely to laxly white arachnoid. Basal and lower stem leaves mostly present at anthesis; petiole 2.5–8 cm, sparsely arachnoid or glabrescent, basally somewhat expanded; blade ovate to elliptic-oblong, 4–6 × 1–3.5 cm, papery, abaxially white and densely arachnoid, adaxially sparsely arachnoid and ± glabrescent, pinnately
Herbs, rhizomatous. Stem solitary, erect, green or becoming purplish above, 20–25 cm tall, not branched, glabrous or sometimes sparsely arachnoid-pubescent. Basal leaves withered and shed by anthesis; lower stem leaves long petiolate; petiole 3–3.5 cm, not winged, basally slightly expanded; blade ovate or ovate-elliptic, 2.5–3 × 1.2–2.0 cm, both surfaces glabrous, lateral veins 4–6, base cuneate-attenuate, margin entire or inconspicuously denticulate, reflexed when dry, apex obtuse or rounded. Median and upper stem leaves sessile or subsessile; blade narrowly lanceolate to linear, 2.5–4.5 × 0.5–5.0 cm, base slightly expanded, glabrous, apex obtuse and puberulent. Ray florets 8–11; corolla tube ca. 3 mm, puberulent above; lamina yellow, oblong or oblong-elliptic, 5.0–7.5 × 1.5–3.0 cm, subglabrous. Involucres campanulate or cylindric, 8–12 × 5–8 mm; bracteoles 5–8, black-purple, pinnately 3–5-lobed; phyllaries ca. 15, linear-lanceolate, distinctly shorter than disk, 1.0–2.0 cm wide, glabrous, acute and puberulent. Ray florets 8–11; corolla tube ca. 3 mm, puberulent above; lamina yellow, oblong or oblong-elliptic, 7.0–9.0 × 2.5–3.5 mm, 4- or 5-veined, apically 3-denticulate. Disk florets 20–25; corolla yellow, 7–8 mm, with ca. 3.5 mm tube and funnelform limb, lobes ovate-oblong, ca. 1 mm, apically purplish, acute, and papilllose. Anthers ca. 2.5 mm, basally subacutely auriculate, appendages ovate-lanceolate; antheropodia elongated, robust, basally slightly dilated. Style branches ca. 1 mm. Achenes cylindric, 1.5–2.0 cm, glabrous. Pappus white, ca. 7 mm. Fl. Jul.–Sep.

- Wet places, riverbanks, gravel of riversides, streambeds; 2900–3600 m. E Xizang (Bomi, Gongbo'gyamda).


稻城千里光 dao cheng qian li guang

Herbs, perennial, rhizomatous. Stem solitary, erect, green or becoming purplish above, 20–25 cm tall, not branched, glabrous or sometimes sparsely arachnoid-pubescent. Basal leaves withered and shed by anthesis; lower stem leaves long petiolate; petiole 3–3.5 cm, not winged, basally slightly expanded; blade ovate or ovate-elliptic, 2.5–3 × 1.2–2.0 cm, both surfaces glabrous, lateral veins 4–6, base cuneate-attenuate, margin entire or inconspicuously denticulate, reflexed when dry, apex obtuse or rounded. Median and upper stem leaves sessile or subsessile; blade narrowly lanceolate to linear, 2.5–4.5 × 0.5–5.0 cm, base slightly expanded, amplexicaul, apex slightly acute or obtuse. Capitula radiate, usually 3 or 4 in terminal raceme, with linear bracts 10–15 mm; peduncles pendulous, 5–10(–40) mm, sparsely arachnoid-pubescent. Involucres campanulate or cylindric, 7–10 × 5–8 mm; bracteoles 5–8, black-purple, pinnately 3–5-lobed; phyllaries ca. 15, linear-lanceolate, distinctly shorter than disk, 1.0–2.0 mm wide, glabrous, apically acute and puberulent. Ray florets 8–11; corolla tube ca. 3 mm, puberulent above; lamina yellow, oblong or oblong-elliptic, 7.0–9.0 × 2.5–3.5 mm, 4- or 5-veined, apically 3-denticulate. Disk florets 20–25; corolla yellow, 7–8 mm, with 1.5–2.0 mm tube and funnelform limb, lobes ovate-oblong, apically brown, puberulent. Anthers linear, basally obtuse. Style branches reflexed, subtruncate, papilllose. Achenes subcylindric, 2.5–3.0 mm, glabrous. Pappus white, ca. 7 mm. Fl. Aug.–Sep.

- Montane meadows; ca. 4800 m. Sichuan (Daocheng).


Herbs, dwarf, rhizomatous, with leafy stems. Leaves oblanceolate-oblong to spatulate, axially usually tomentose, basally cuneate to attenuate, at least stem leaves often pinnately lobed. Capitula radiate, erect. Phyllaries 13 or 18–20, herbaceous. Ray florets 5 or 6 or 10–14. Disk florets 15 to many. Anthers subacutely auriculate at bases; antheropodia rather stout, basally gradually dilated.

About six species: Himalaya and Myanmar to Russia; five species (three endemic) in China.


白紫千里光 bai zi qian li guang


Herbs, dwarf, rhizomatous. Stems erect, 8–20 cm tall,
slender, simple, arachnoid-tomentose, glabrescent. Basal leaves mostly present at anthesis, long petiolate; blade elliptic or obovate-elliptic, obtusely few toothed or sublobulate; median stem leaves shorter petiolate; petiole somewhat expanded at base, not auriculate; blade oblong or oblong-lanceolate, 3–5 × 1–1.5 cm, pinnately lobed or pinnatifid with 6–10 oblong or ovate-oblong shallowly denticulate or subentire lateral lobes, abaxially densely tomentose, adaxially sparsely arachnoid, pinnately veined. Upper leaves smaller, lanceolate to linear-lanceolate, lobed or subentire, basally sessile and subamplexicaul. Capitula radiate, 2–6 in lax terminal corymb, rarely solitary; peduncles to 5 cm, sparsely arachnoid, with 2 or 3 linear or linear-subulate bracteoles. Involucres campanulate, 8–10 × 7–8 mm, calyculate; bracts of calycus 6–8(–10), green or purplish, linear-subulate, 3–5 mm, acute, sparsely arachnoid; phyllaries 18–20, green or purplish, linear-lanceolate, 1–1.5 mm wide, dark brown or purplish on upper margin, herbaceous, sparsely arachnoid, glabrescent, apically acuminate and white pubescent. Ray florets 10–13; corolla tube ca. 5 mm; lamina yellow, oblong, 10–12 × ca. 2 mm, 4-veined, apically 3-denticulate. Disk florets many; corolla yellow, 7–8 mm, with 3–3.5 mm tube and funnelform limb; lobes ovate-lanceolate, ca. 1.5 mm, apically acute, papilllose. Anthers ca. 2.5 mm, basally subacutely auriculate, appendages ovate-lanceolate; antheropodia elongate, basally somewhat dilated. Style branches ca. 1.5 mm. Achenes cylindrical, 2.5 mm, glabrous. Pappus white or straw-colored at least at base, ca. 7 mm. Fl. Jul–Aug.

Grassy slopes, open wet places, streamsides; 2400–5000 m. Gansu, Nei Mongol, Qinghai, Sichuan, Xinjiang, Xizang [Kazakhstan, Kyrgyzstan, N Myanmar, Russia].


Herbs, perennial, rhizomatous. Rhizomes shorter. Stem erect or rather flexuous at base, 5–15 cm tall, slender, simple, white arachnoid or sometimes glabrate. Basal and lower leaves present at anthesis, long petiolate; petiole slightly expanded, but not amplexicaul; blade adaxially green, ovate or obvate, rarely spatulate or suborbicular, 1.5–4 × 1–1.7 cm, abaxially densely white arachnoid, adaxially sparsely arachnoid or ± glabrous, lateral veins 4–6-paired, inconspicuous, base cuneate-attenuate into petiole 1.5–3 cm, margin subentire or undulate-dentate, apex obtuse or rounded, rarely rather acute. Median stem leaves subsessile or shortly petiolate; blade oblong or oblong-spulate, 2.4 × 5–8 cm, base cuneate, slightly expanded and amplexicaul, margin subentire or inconspicuously dentate, apex obtuse or slightly acute. Uppermost leaves smaller, bractlike, linear, 5–10 cm. Capitula solitary, terminal, erect or nodding, subsessile or shortly pedunculate. Involucres campanulate or campanulate-subglobose, 10–13 × 15–20 mm, basally 10–13 linear-lanceolate bracteole; bracteoles 5–7 mm, sparsely arachnoid or glabrescent, margin brown scariosus-fimbriate, apically acuminate; phyllaries 21–23, linear-lanceolate, 10–11 × 1–1.5 mm, herbaceous, puberulent or glabrous, margin narrowly scarious, apically purplish and puberulent. Ray florets 10–13; corolla tube 3.5–4 mm; lamina yellow, oblong, 10–11 × 2.5–3 mm, 4-veined, apically 3-denticulate. Disk florets many; corolla yellow, 8–9 mm, with ca. 3 mm tube and narrowly funnelform limb; lobes triangular-ovate, apically acute, puberulent. Anthers linear, basally obtuse. Style branches obtuse, papilllose. Achenes cylindrical, 2.5 mm, glabrous. Pappus white, 10–11 mm.

● Alpine rocky slopes; 4100–4800 m. Sichuan (Kangding, Xiangcheng).


Herbs, dwarf, perennial. Stems solitary or sometimes paired, erect, 2–6 cm tall or nearly obsolete, sparsely arachnoid. Basal leaves rosulate, petiolate, present at anthesis; petiole 1–4 cm, basally expanded and subamplexicaul; blade oblancoellate-spatulate, 2.5 × 0.7–2 cm, papery, abaxially densely white tomentose, adaxially sparsely arachnoid on midvein and glabrescent, margin lyrate-pinnatifid with ovate or ovate-triangula
terminal lobe and 6–8 ovate-oblong or subtriangular, obtuse, 1- or 2-dentate lateral lobes, or sometimes subentire, apex obtuse. Stem leaves lyrate-pinnatifid, similar to basal leaves; uppermost leaves smaller. Capitula radiate, 2 or 3 in a terminal corymb or solitary, shortly pedunculate or subsessile. Involucres campanulate, 8–9 × 6–8 mm, calyculate; bracts of calyculus 3 or 4, linear-lanceolate or linear, 5–6 mm, sparsely arachnoid, fimbriate on margin, apically acuminate; phyllaries ca. 20, linear-lanceolate, 8–9 × 1.5–2 mm, herbaceous, sparsely arachnoid, margin narrowly scarious, apically acuminate, blackish brown and ciliate on upper margins and apex. Ray florets 13 or 14; corolla yellow, ca. 2 mm, apically acute, papillose. Anthers ca. 2 mm, basally yellow, ca. 6.5 mm, with ca. 3 mm tube; lobes ovate-lanceolate, ca. 1 mm, apically acute, papillose. Anthers basally subacutely auriculate; antheropodia rather long, basally slightly dilated. Style branches ca. 1.2 mm. Achenes cylindrical, ca. 2.5 mm, glabrous. Pappus white, ca. 6 mm. Fl. Aug–Sep.

- Alpine meadows; 4000–5400 m. Xizang.


工布千里光  gong bu qian li guang

Herbs, dwarf, perennial. Stem solitary, erect, 2–4 cm tall, simple, arachnoid-pubescent, ± glabrescent. Basal leaves present at anthesis, rosulate; petiole short, basally expanded and subamplexicaul; blade oblanceolate-oblong or spatulate, 1.5–4 × 0.5–0.7 cm, abaxially densely white arachnoid-tomentose except for midvein, adaxially sparsely pilose and glabrescent, base cuneate-attenuate, margin mucronulate-dentate, apex obtuse to acute. Stem leaves subsessile; blade oblong or oblong-lanceolate, margin remotely dentate to deeply serrate or lyrate-pinnatifid, apex obtuse. Capitula radiate, 5–7 in a compact terminal corymb; peduncles 2–3 mm, arachnoid, linear-bracteolate. Involucres campanulate, 4–5 × 3–4 mm, calyculate; bracts of calyculus 4 or 5, linear or linear-lanceolate, 4–5 × ca. 1 mm, apically acuminate, fimbriate or minutely denticulate, dark brown; phyllaries ca. 13, ca. 6 × 0.5–1 mm, dark purplish red and ciliate on upper margins and apex, herbaceous, sparsely arachnoid to glabrous, margin narrowly scarious, apically acuminate. Ray florets 5 or 6; corolla tube ca. 4 mm; lamina yellow, ca. 4 × 0.8 mm, 4-veined, apically 3-denticulate. Disk florets ca. 15; corolla yellow, ca. 6.5 mm, with ca. 3 mm tube and funnelform limb; lobes ovate-lanceolate, ca. 1 mm, brownish, apically acute, papillose. Anthers ca. 1.8 mm, basally subacutely auriculate; antheropodia gradually dilated toward base. Style branches ca. 1 mm. Achenes (immature) cylindrical, ca. 1.5 mm, glabrous. Pappus white, ca. 6 mm. Fl. Aug–Sep.

- Alpsine grasslands, wet scree slopes; 3600–3900 m. Xizang (Bomi, Gongbo’gyamda).


紫裂千里光系  zi lie qian li guang xi

Herbs, perennial (?or biennial), erect. Leaves pinnately divided, not auriculate. Capitula discoid, nodding. Phyllaries 13–20, herbaceous, usu­ally purplish, fimbriate, bearded at apex. Disk florets many; corolla limb and tube purplish or purplish tinged; lobes dark purple. Anthers basally subacutely to acutely auriculate; antheropodia moderately elongated, basally somewhat dilated.

- Two species: China.


风毛菊状千里光  feng mao ju zhuang qian li guang

Herbs, perennial (?or biennial). Stem solitary, erect, 30–80 cm tall, simple, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, glabrous, not winged, basally slightly expanded, not ciliate at anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long petiolate; median stem leaf petiole 2–5 cm, slender, subglabrous. Basal and lower leaves withered by anthesis, long peti-
papyry, both surfaces sparsely arachnoid and glabrescent, pin- 
natifid into a large lanceolate, acute, acutely dentate terminal 
lobe and in lower half 6–10 small, short, triangular-lanceolate, 
5–6 mm; base navicular, slightly auriculate, margin abruptly 
serrate. Lower leaves shortly petiolate or subsessile, linear- 
lanceolate or linear, smaller upward, 1–3 cm, margin dentate, 
apex acuminate. Capitula disoid, nodding, 3 or 4 in a terminal 
corymb; peduncles erect, apically recurved, to 3–4 cm, stout, 
puberulent, not bracteate. Involucres broadly campanulate, 7–8 
× ca. 8 mm, calyculate; bracts of calyculus 8–10, purplish, lin- 
er or linear-subulate, 6–7 × ca. 0.5 mm, entire, sparsely pu- 
berulent, white bearded at apex; phyllaries 13–15, lanceolate, 
6–8 × ca. 2 mm, purple with darker veins, tips, and upper mar- 
gins, sparsely arachnoid and purple puberulent, apically acute, 
firmbritate and white bearded. Disk florets many; corolla pur- 
plish, ca. 9 mm, with ca. 4 mm tube, acutely acute, papillose. 
Anthers ca. 2.5 mm, basally subacutely to acutely auriculate, 
appendages ovate-lanceolate; antheropodia gradually somewhat 
expanded toward base. Achenes cylindric, 3–3.5 mm, glabrous. 
Pappus white, ca. 7 mm. Fl. Sep.–Oct.

● Alpine meadows; ca. 4400 m. Sichuan (Songpan).


Herbs, perennial, erect, sometimes robust, with leafy stems. Leaves usually lyrate-pinnately divided or basally sometimes undi- 
\[\text{continued}\]
Achenes cylindric, ca. 2 mm, glabrous. Pappus white, ca. 4 mm. 
Fl. Jun.

- Montane thickets, moors; 1200–1300 m. Guangxi (Lucheng), Hunan (Wugang).


双舌千里光 shuang she qian li guang

**Senecio gyirongensis** Y. L. Chen & K. Y. Pan; **S. ramsbottomii** Handel-Mazzetti.

Herbs, perennial, rhizomatous. Stem solitary, erect, 60–90 cm tall, flexuous, pubescent or glabrous. Basal leaves withered by anthesis; lower and median stem leaf petiole ≠ interruptedly winged in upper part, basally continuously and gradually more broadly winged, auriculate; auricle subamplexicaul, dentate; blade abaxially often purple, triangular or triangular-lanceolate, 7–12 × 2–5 cm, abaxially puberulent mostly on veins or glabrous, adaxially obscurely scattered pubescent, pinnately veined, veins rather prominent abaxially, base cordate to sagittate or subulate and sometimes lyrate 2–4-lobed, margin irregularly coarsely dentate, apex acuminetate. Upper leaves sessile, gradually smaller upward, triangular-lanceolate to linear-lanceolate, 5–10 × 1–2 cm, base cuneate, margin often lyrate-pinnatifid, confluent with auricle at base, apex acuminetate-attenuate. Capitula small, radiate, numerous, arranged in dense terminal compound corymbs; peduncles very short, 1–2 mm, pubescent, minutely 1- or 2-bracteolate. Involucres narrowly campanulate, 3–5 × 1.5–2 mm, calyculate; bracts of calycus 3 or 4, linear; phyllaries 8, linear, 3–4 × ca. 1 mm, herbaceous, glabrous, margin narrowly scarious, apically obtuse, purplish and minutely fimbriate. Ray florets 3 or 4; corolla tube ca. 2.5 mm; lamina yellow, linear, ca. 4.5 × 1 mm, 3- or 4-veined, 2- or 3-denticulate. Disk florets 6–9; corolla yellow, ca. 5.5 mm, with ca. 2.5 mm tube and funnelform limb; lobes oblong-lanceolate, ca. 1.2 mm, apically acute, papilllose. Anthers ca. 1.6 mm, basally obtuse-auriculate, appendages ovate-oblong; antherodia rather short, slender, basally slightly dilated. Style branches ca. 1 mm. Achenes cylindric, ca. 3 mm, glabrous. Pappus white, ca. 4 mm. Fl. Jun.–Aug.

- Forests, thickets, grassy slopes, shaded wet places; 900–2700 m. Guizhou, Shaanxi, Sichuan.

37. **Senecio filifer** Franchet, J. Bot. (Morot) 10: 416. 1896 ("filiferus").

匍枝千里光 fu zhi qian li guang

**Senecio filifer** var. *dilatatus* Handel-Mazzetti.

Herbs, perennial, stoloniferous, rhizomatous. Stolons slender, with long internodes, leafy or usually leaves reduced to small scales. Stem solitary, erect, 60–100 cm tall, simple, laxly pubescent and sometimes also thinly arachnoid-tomentose when young, glabrescent. Basal leaves mostly present at anthesis; petiole 3–6 cm, often ≠ winged in upper part, basally expanded but not auriculate; blade pandurate or usually ≠ lyrate, 12–18 × 3.5–6 cm, papery, glabrous, with large oblong-lanceolate, obtuse or subacute, unequally dentate or sinuate-dentate terminal lobe and 2–6 much smaller ovate-triangular to oblong lateral lobes. Median stem leaves with broadly winged petioles or sessile, oblong-lanceolate, blade ≠ confluent into rounded, dentate, amplexicaul auricle at base, margin coarsely dentate, sometimes ≠ lyrate-pinnatifid in lower part, apex obtuse. Upper leaves sessile, gradually smaller upward, lanceolate or linear-lanceolate, base rounded-auriculate, apex acuminetate. Uppermost leaves narrower, apically attenuate or caudate. Capitula numerous, arranged in terminal simple or compound ≠ subumbelliform corymbs; peduncles 5–10 mm, slender, sparsely puberulent, mostly basally bracteate, bracteoles 2 or 3, linear-sulculate. Involucres narrowly campanulate, 4.5 × 2–3 mm, calyculate, bracts of calycus 3–5, subulate; phyllaries 13, linear, 4–5 × ca. 1 mm, herbaceous, sparsely puberulent, glabrescent, margin broadly scarious, apically obtuse, purplish and puberulent. Ray florets 5; corolla tube ca. 3.5 mm, apically sparsely puberulent; lamina yellow, oblong, 4.4–5 × ca. 1.5 mm, 4-veined, apically 3-den...
ticulate. Disk florets 11–13; corolla yellow, ca. 4.5 mm, with ca. 2 mm tube and funnelform limb; lobes ovate-triangular, ca. 1 mm, apically acute. Anthers ca. 1.7 mm, basally obtuse-auriculate, appendages ovate-lanceolate; antheropodia rather small, slightly dilated in lower half. Style branches ca. 0.5 mm. Achenes cylindric, ca. 2.5 mm, glabrous. Pappus white, ca. 6 mm. Fl. May–Aug.

- Wet places in mixed woods, thicket margins, grassy slopes; 700–3700 m. Y. Ling, SW Sichuan, Yunnan.

38. Senecio pteridophyllus Franchet, J. Bot. (Morot) 8: 364. 1894.


1a. Capitula radiate; fl. Jun–Aug .......... 40a. var. diversipinnus
1b. Capitula discoid; fl. Jul–Aug .............. 40b. var. discoideus

40a. Senecio diversipinnus var. diversipinnus

无舌异羽千里光  wu she yi yu qian li guang


无舌异羽千里光  wu she yi yu qian li guang


无舌异羽千里光  wu she yi yu qian li guang


孝状千里光系  ting zhuang qian li guang xi

Two species: N Bangladesh, China, NE India, Myanmar, NE Thailand; two species (one endemic) in China.


匙叶千里光  shi ye qian li guang

Ligularia yui S. W. Liu.


Two species: N Bangladesh, China, NE India, Myanmar, NE Thailand; two species (one endemic) in China.

42. Senecio obtusatus Wall. ex Candolle, Prodr. 6: 367. 1838.

钝叶千里光  dun ye qian li guang

Senecio obtusatus Pursh (Fl. Amer. Sept. 2: 530. 1813) was merely cited as a synonym and was therefore not validly published (Vienna Code, Art. 34.1(c)). The replacement name Senecio khasianus was therefore nomenclaturally superfluous when published and is consequently illegitimate (Art. 52.1).
Herbs, perennial, erect, with ± arachnoid-pubescent usually leafy stems, rarely subscapigerous. Basal leaves lyrate-pinnately divided. Stem leaves pinnately divided. Capitula radiate, erect, medium-sized, several to numerous. Phyllaries 10–22, herbaceous, apically acute-acuminate. Ray florets 10–21. Disk florets many. Antheropodia distinctly to markedly dilated toward base. Achenes all glabrous or all pubescent or ray achenes glabrous and pappus sometimes absent in ray florets, rarely absent in all florets. About 40 species: mainly temperate and montane Asia and Europe; nine species (one endemic) in China. One of us (Nordenstam) treats the species of this series within the genus Jacobaea.

### 43. Senecio multibracteolatus


**多苞千里光** duo bao qian li guang

*Jacobaea multibracteata* (C. Jeffrey & Y. L. Chen) B. Nordenstam.

Herbs, perennial, rhizomatous. Stem solitary, erect, to 60 cm tall, sparingly arachnoid, simple. Basal and often lower stem leaves withered and shed by anthesis; lower and median stem leaves ± sessile; blade obovate-oblong, elliptic-oblong, or ovate-oblong, 6–13 × 2.5–4 cm, thickly papery, abaxially arachnoid, adaxially sparsely arachnoid, glabrescent to glabrous, base ± expanded and lobulate-auriculate, lyrate-pinnatifid or pinnatifid with ovate-oblong or oblong, obtuse or subacute, irregularly dentate or pinnately lobulate terminal lobe and 14–18 oblong-oblong-lanceolate, irregularly dentate or lacerate lateral lobes. Upper leaves similar but smaller, thickly papery; uppermost leaves reduced, bractiform. Capitula radiate, numerous, arranged in terminal corymbs; peduncles 1–3.5 cm, white arachnoid-tomentose, with 2 or 3 linear-subulate bracteoles. Involucres campanulate, ca. 6 × 6–8 mm, calyculate; bracts of calycus 10–17, linear-subulate, acute, 3–4 mm, apex dark; phyllaries 18–20, linear-lanceolate, 1–1.5 mm wide, herbaceous, narrowly oblong, ca. 6.5 × 2 mm, 4-veined, apically obtuse, unlobed or lyrate-pinnately lobed with 2–8 basal lateral lobes decreasing in size toward base of leaf. Median stem leaves oblong or oblong-lanceolate-oblong, 5–22 × 2–7 cm, base auriculate; auricle dentate or lobulate, subamplexicaul, lyrate-pinnatifid or pinnatifid, very variable in dissection, with large to small, ovate to oblong-lanceolate, dentate or lobulate terminal lobe and 10–16 oblong to narrowly oblong-lanceolate, entire or usually irregularly serrate-dentate or lobulate spreading or somewhat ascending lateral lobes. Upper leaves smaller, oblong-lanceolate to oblong-linear, margin coarsely pinnate-dentate. Capitula radiate, numerous, arranged in terminal corymbs or compound corymbs; peduncles 5–25 mm, ± arachnoid-tomentose or fulvous puberulent, ± glabrescent, linear-bracteate, with 2 or 3 linear-subulate bracteoles. Involucres campanulate, 3–4 × 3–4 mm, calyculate; bracts of calycus 8–10, linear-subulate, 2–3 mm; phyllaries 10–13, oblong-lanceolate, herbaceous, fulvous puberulent toward base, margin broadly scarios, apically acute or acuminate, brownish black and pubescent. Ray florets 10–13; corolla tube ca. 4 mm, slender; lamina yellow, oblong-elliptic, 9–12 × ca. 2.5 mm, apically 3-denticate. Disk florets many; corolla yellow, ca. 6 mm, with ca. 2.3 mm glabrous tube and funnelform limb; lobes ovate-triangular, ca. 0.8 mm, apically acute, papillose. Anthers ca. 2 mm, basally obtuse-auriculate, appendages ovate-lanceolate; antheropodia rather elongated, basally somewhat expanded. Style branches ca. 0.8 mm. Achenes cylindric, 2.5–3 mm, glabrous. Pappus white, ca. 6 mm, present in all florets. Fl. Nov.

- Forest margins; 2700–2800 m. Sichuan (Daocheng, Muli), Yunnan (Lijiang).

### 44. Senecio analogus

*Candolle*, Prodr. 6: 366. 1838.

**菊状千里光** ju zhuang qian li guang

*Jacobaea analoga* (Candolle) Veldkamp; *Senecio chrysanthemoides* Candolle (1838), not Schrank (1789); *S. spectabilis* Wallich ex Candolle. Herbs, perennial, rhizomatous, with leafy stems, rarely subscapigerous. Stem solitary, erect, 40–80 cm tall, simple or branching into synflorescence, sparingly arachnoid, glabrescent. Basal leaves sometimes present at or sometimes withered and shrunke or shed by anthesis; basal and lowest stem leaves petiolate; petiole ca. 10 cm; blade ovate-elliptic or ovate-lanceolate to oblanceolate, 8–10(–20) × 3–7 cm, papery, abaxially sparsely arachnoid and ± glabrescent, adaxially glabrescent to glabrous, narrowly veined, lateral veins 16–18, base expanded, weakly cordate to cuneate or attenuate, margin dentate, apex obtuse, unlobed or lyrate-pinnately lobed with 2–8 basal lateral lobes decreasing in size toward base of leaf. Median stem leaves oblong or oblanceolate-oblong, 5–22 × 2–7 cm, base auriculate; auricle dentate or lobulate, subamplexicaul, lyrate-pinnatifid or pinnatifid, very variable in dissection, with large to small, ovate to oblong-lanceolate, dentate or lobulate terminal lobe and 10–16 oblong to narrowly oblong-lanceolate, entire or usually irregularly serrate-dentate or lobulate spreading or somewhat ascending lateral lobes. Upper leaves smaller, oblong-lanceolate to oblong-linear, margin coarsely pinnate-dentate. Capitula radiate, numerous, arranged in terminal corymbs or compound corymbs; peduncles 5–25 mm, ± arachnoid-tomentose or fulvous puberulent, ± glabrescent, linear-bracteate, with 2 or 3 linear-subulate bracteoles. Involucres campanulate, 3–4 × 3–4 mm, calyculate; bracts of calycus 8–10, linear-subulate, 2–3 mm; phyllaries 10–13, oblong-lanceolate, herbaceous, fulvous puberulent toward base, margin broadly scarious, apically acute or acuminate, brownish black and pubescent. Ray florets 10–13; corolla tube ca. 2.5 mm; lamina yellow, oblong, ca. 6.5 × 2 mm, 4-veined, apically obtuse, 3-denticate. Disk florets many; corolla yellow, 5–5.5 mm, with ca. 2.5 mm tube and funnelform limb; lobes ovate-triangular, ca. 0.8 mm, apically acute. Anthers ca. 2 mm, basally obtuse-auriculate, appendages ovate-lanceolate; antheropodia slightly elongated, basally somewhat dilated. Style branches ca. 1 mm. Achenes cylindric, 2–2.5 mm, all or disk achenes sparsely pubescent, sometimes ray achenes or rarely all achenes glabrous. Pappus white dirty, straw-colored, or rarely rufous, ca. 4 mm, present in all achenes or sometimes scant or absent in ray achenes, those in ray achenes deciduous. Fl. Apr.

- Forests, forest and thicket margins, open grassy places, field margins, roadsides; 1100–3800 m. Guizhou, Hubei, Sichuan, Xizang, Yunnan [Butan, NE and NW India, Nepal, NW Pakistan].

### 45. Senecio tibeticus

*C. Jeffrey & Y. L. Pan*, *S. sisymbriiformis* Candolle; *S. spectabilis* Wallich ex Candolle. Herbs, perennial, rhizomatous. Stems solitary or sometimes 2 or 3, erect, 13–40 cm tall, simple, white arachnoid-to...
mentose, glabrescent. Basal leaves present at anthesis, long petiolate; blade oblancoate, 8–10 × 1–1.5 cm, abaxially white tomentose, adaxially sparsely arachnoid, lyrate-pinnatifid, with large ovate-lanceolate, obtuse, irregularly dentate terminal lobe and several short, irregularly incised lateral lobes. Median stem leaves sessile, narrowly oblong-lanceolate, pinnatifid, basally auriculate and subamplexicaul. Upper leaves smaller, linear-lanceolate to linear, apically acuminate. Capitula radiate, 2–6 in a lax terminal corymb, long pedunculate; peduncles 2–7 cm, stout, sparsely to densely arachnoid-tomentose, basally bracteate, with 2 or 3 linear-subulate bracteoles. Involucres campanulate, ca. 8 × 6–8 mm, calulate; bracts of calyculus 6–8, subulate, 1/3–1/2 as long as involucule; phyllaries ca. 20, linear-lanceolate, ca. 1.5 mm, herbaceous, densely tomentose, 3-veined, margin broadly scarious, apically acuminate and pubescent. Ray florets 16–21; corolla tube ca. 4 mm; lamina yellow, oblong, 10–11 × ca. 2.5 mm, 4- or 5-veined, apically 3-denticulate. Disk florets many; corolla yellow, ca. 8 mm, with ca. 3 mm tube and funnelform limb; lobes ovate-triangular, ca. 1 mm, apically acute, papilllose. Anthers ca. 2.7 mm, basally obtuse-auriculate, appendages ovate-lanceolate; antheropodia rather elongated, basally markedly dilated. Style branches ca. 1 mm. Achenes cylindric, ca. 2.5 mm, glabrous. Pappus white, ca. 7 mm, present on all achenes. Fl. Jul–Sep.

Alpine meadows; 3000–3900 m. SW Xinjiang [Pakistan].

This taxon has not yet been recorded for China but may well occur in SW Xinjiang (Karakorum Shan).

46. Senecio raphanifolius Wall ex Candolle, Prodr. 6: 366. 1838.

莱菔千里光 lai fu qian li guang

Jacobaea raphanifolia (Wallich ex Candolle) B. Nordenstam; Senecio diversifolius Wall ex Candolle (1838), not Dumortier (1827).

Herbs, perennial, rhizomatous, with leafy stems. Stems solitary or sometimes 2 or 3, erect, 60–150 cm tall, simple or branching into synflorescence, sparsely arachnoid, glabrescent. Basal leaves present at sometimes with aturly and shriveled or shed by anthesis; basal and lowest stem leaves long petiolute; petiole 5–8 cm, base expanded; blade oblancoate, 15–30 × 2–5 cm, papery, abaxially sparsely arachnoid or glabrous, adaxially glabrous, lyrate-pinnatifid with a large, oblong or elliptic-oblong, incised-dentate or lobulate terminal lobe and 12–16 smaller, oblong, incised-dentate lateral lobes smaller toward base of leaf. Median stem leaves sessile; blade oblong, 10–15 × 2.5–4 cm, base auriculate; auricle broad, dentate or lacerate, subamplexicaul; blade pinnatifid or subpinnatisect with somewhat indistinct ovate-oblong terminal lobe and 10–16 oblong, sharply dentate or lacerate-lobulate, spreading or somewhat ascending lateral lobes. Upper leaves smaller, oblong to oblong-lanceolate, pinnately dentate or lobulate. Capitula radiate, numerous, arranged in terminal corymbs or compound coryms; peduncles 1–3 cm, rather stout, at first sparsely arachnoid, fulvous puberulent, ± glabrescent, with usually 2 or 3 linear bracteoles. Involucres broadly campanulate or hemispheric, 5–7 × 4–10 mm, calulate; bracts of calyculus 8–10, linear-subulate, ca. 3 mm; phyllaries 12–16, oblong, 1.5–2 mm, herbaceous, fulvous puberulent in lower part, ± glabrescent, margin narrowly scarious, apically acuminate, acute, blackish brown and pubescent. Ray florets 12–16; corolla tube ca. 3 mm; lamina yellow, oblong, ca. 8 × 2–3 mm, 4-veined, apically obtuse, 3-denticulate. Disk florets many; corolla yellow, ca. 5 mm, with ca. 2 mm tube and funnelform limb; lobes oblong-lanceolate, ca. 1 mm, apically acute, papilllose. Anthers ca. 2 mm, basally obtuse-auriculate, appendages ovate-lanceolate; antheropodia rather elongated, basally markedly dilated. Style branches ca. 0.8 mm. Achenes cylindric, ca. 3 mm, glabrous. Pappus reddish brown, 4–5 mm, present in disk florets, scant and soon deciduous or absent in ray florets. Fl. Jul–Sep.

Montane forests, meadows, grassy slopes, riverbanks; 2700–4400 m. Xizang [Bhutan, NE India, N Myanmar, Nepal].


裸缨千里光 luoying qianli guang

Jacobaea echaeta (Y. L. Chen & K. Y. Pan) B. Nordenstam.

Herbs, perennial, rhizomatous, with leafy stems. Stem solitary, erect, 30–60 cm tall, simple or branching into synflorescence, arachnoid, glabrescent. Basal leaves withered by anthesis, petiolate; lower and median stem leaves sessile; blade oblong-lanceolate, 5.4–5 × 1.5–5 cm, papery, abaxially sparsely finely pubescent on main veins, adaxially glabrous, pinnatifid or subpinnatisect with small, rather indistinct terminal lobe and 18–20 oblong, 2–2.5 × 0.5–1 cm, acutely dentate or lacerate-lobulate, spreading or somewhat ascending lateral lobes; base auriculate; auricle dentate or lacerate, subamplexicaul. Upper leaves smaller, oblong-lanceolate to lanceolate, pinnately lobulate. Capitula radiate, 3–10 in terminal and upper axillary corollas; peduncles 10–15 mm, arachnoid, with 1 or 2 linear bracteoles. Involucres campanulate or hemispheric, 5–6 6–8 mm, calulate; bracts of calyculus 6–8, linear, 3–4 mm, apically acuminate, purplish; phyllaries 20–22, lanceolate, 4.5–5 × 1–1.5 mm, herbaceous, sparsely arachnoid-pubescent at base, 3-veined, apically acuminate or acute, dark margin and white bearded. Ray florets 16–18; corolla tube ca. 2.5 mm; lamina yellow, elliptic-oblong, 9–10 × ca. 3 mm, 8-veined, apically 3-denticulate. Disk florets many; corolla yellow, ca. 5 mm, with 1–1.5 mm tube and funneliform limb; lobes ovate-oblong, ca. 1.2 mm, apically acute, papilllose. Anthers ca. 2 mm, basally acutely long auriculate, appendages ovate-lanceolate; antheropodia rather shorter, basally distinctly dilated. Style branches ca. 0.7 mm. Achenes cylindric, ca. 1.7 mm, glabrous. Pappus absent from all florets. Fl. Jul.

Tsuga forests; ca. 2700 m. S Xizang (Gyirong) [Nepal].


裸茎千里光 luojing qianli guang

Jacobaea nudicaulis (Buchanan-Hamilton ex D. Don) B. Nordenstam; Senecio blattarifolius Franchet; S. esquirolii H. Lévêillé; S. pallens Wallich ex Candolle; S. rosulifer H. Lévêillé & Vaniot; S. yunnanensis Franchet (1894), not Franchet (1893).
Herbs, perennial, ± subscapigerous, rhizomatous. Stems solitary or 2 or 3-fasciculate, erect, 30–70 cm tall, simple. Basal leaves rosulate, sessile, oblong-oblong, 3–18 × 0.8–1.8 cm, abaxially sparsely arachnoid, glabrescent to glabrous and sometimes purplish, pinnately veined, lateral veins 10–14, midvein and main veins rather prominent abaxially, attenuate to base, margin subentire or crenate-serrate, apically obtuse or rounded. Stem leaves few, usually 3–5, sessile; blade oblong or oblanceolate-oblong, 2–4 × 0.5–1.5 cm, base expanded, auriculate and sub-amplexical, margin crenate-dentate to lobulate, apically obtuse. Capitula radiate, few in terminal compound corymbs; peduncles 1–2.5 cm, sparsely arachnoid or puberulent, bracteate, with 1–3 linear bracteoles. Involucres broadly campanulate, 5–6 × 3–6 mm, calyculate; bracts of calycus 4 or 5, linear-subulate, 2–3 mm, herbaceous, sparsely arachnoid or sub-glabrous, 3-veined, margin broadly scarious, apically acute and puberulent. Ray florets 13; corolla tube ca. 4 mm; lamina yellow, oblong, ca. 10 × 2–2.5 mm, 4-veined, apically 3-denticulate. Disk florets many; corolla yellow, ca. 6 mm, with ca. 2.5 mm tube and funneliform limb; lobes ovate-triangular, ca. 0.7 mm, apically acute, papillose. Anthers ca. 1.8 mm, basally auriculate, appendages ovate-lanceolate; antheropodia distinctly dilated toward base. Style branches ca. 1 mm. Achenes cylindric, ca. 3 mm, glabrous in ray florets, sparsely pubescent in disk florets, rarely all glabrous. Pappus whitish, ca. 6 mm, present in all florets. Fl. Aug–Sep, fr. Sep–Oct.

Grassy places, forest margins; 500–1400 m. Gansu, Hebei, Heilongjiang, Henan, Jilin, Liaoning, Nei Mongol, Shaanxi, Shandong [Korea, Mongolia, Russia (Altai, Far East, E Siberia)].


Jacobaea argunensis (Turczaninow) B. Nordemstam; Senecio argunensis f. argustifolius Komarov; S. argunensis var. blinii (H. Léveillé) Handel-Mazzetti; S. argunensis f. latifolius Komarov; S. blinii H. Léveillé; S. erucifolius Linnaeus subsp. argunensis (Turczaninow) E. Wiebe; S. jacobaea Linnaeus var. grandiflorus Turczaninow ex Candolle.

Herbs, perennial, rhizomatous. Stem solitary, erect, 30–60(–80) cm tall, arachnoid-pubescent, sometimes ± glabrescent, branching into synflorescence. Basal and lower stem leaves withered and usually shed by anthesis; median stem leaves rather crowded, sessile; blade ovate-oblong to oblong, 6–10 × 3–6 cm, papery, abaxially sparsely arachnoid and ± glabrescent, adaxially glabrous, base narrowly auriculate or laciniate-auriculate, pinnatisect to pinnatifid with small indistinct terminal lobe and ca. 12 narrowly lanceolate or linear, 1–2.5 × 0.1–0.5 cm, apically obtuse to acute, marginally 1- or 2-dentate or narrowly lobulate or entire somewhat ascending lateral lobes. Upper leaves smaller and apically more attenuate, otherwise similar. Capitula radiate, numerous, arranged in terminal compound corymbs; peduncles 1–2.5 cm, slender, sparsely to densely arachnoid, bracteate, with a few linear-subulate, 3–5 mm, acuminate bracteoles. Involucres subcampanulate, 5–6 × 6–7 mm, calyculate; bracts of calycus ca. 10, linear, 3–5 mm; phyllaries ca. 13, green or sometimes purplish, oblong-lanceolate, 1–1.5 cm, herbaceous, sparsely arachnoid, margin broadly scarious, apically acuminate or acute and shortly bearded. Ray florets 10–13; corolla tube ca. 4 mm; lamina yellow, oblong-linear, 8–9 × 2–3 mm, 4-veined, apically obtuse, 3-denticulate. Disk florets many; corolla yellow, ca. 6 mm, with 2–2.5 mm tube and funneliform limb; lobes ovate-oblong, ca. 0.7 mm, apically acute. Anthers ca. 2 mm, basally distinctly subacutely auriculate, appendages ovate-lanceolate; antheropodia rather stout, basally dilated. Style branches ca. 0.7 mm. Achenes cylindric, ca. 2.5 mm, glabrous. Pappus whitish, ca. 5.5 mm. Fl. Aug–Oct.

Montane meadows, grassy slopes; 500–3300 m. Anhui, Gansu, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan [Japan, Korea, Mongolia, Russia (Far East, SE Siberia)].


新疆千里光 xin jiang qian li guang

糙叶千里光系 cao ye qian li guang xi


- One species: China.


糙叶千里光 cao ye qian li guang

Senecio henrici Vaniot; S. lebrunei H. Léveillé; S. latifolia Dunn

Herbs, perennial, with woody tuberous rhizomes. Stems solitary or 2- or 3-fasciculate, rather woody at base, erect or semidecumbent, 50–90 cm tall, branching, sparsely arachnoid, glabrescent, soon glabrous. Basal and lower leaves withered and shed by anthesis; median stem leaves withered and rather crowded, numerous, sessile; blade lanceolate to linear, abaxially and marginally shortly hispid or asperulous, adaxially sparsely scabrid or glabrous, pinnately veined, lateral veins 12–14, obscure abaxially, base cuneate and not auriculate, margin revolute and obscurely remotely culate-dentate-subentire, apex acute or apiculate; upper leaves linear, smaller. Capitula radiate, few to numerous, arranged in rather narrow and elongated terminal and upper axillary paniculoid thyrses; peduncles 1–2.5 cm, bracteate, ± arachnoid, with 1–10 linear-subulate bracteoles. Involucres broadly campanulate or hemispheric, 5–6 × 5–7 mm, calyculate; bracts of calyculus 2–6, linear, 2–3 mm, apically acuminate; phyllaries ca. 13, oblong-lanceolate, ca. 1.5 mm, herbaceous, subglabrous, margin scarious, apically acuminate and puberulent. Ray florets 12–15; corolla tube 2.5–3 mm; lamina yellow, oblong, 8–10 × 2–2.5 mm, 4-veined, apically denticulate. Disk florets many; corolla yellow, ca. 6 mm, with ca. 2 mm tube and funnelform limb; lobes triangular-ovate, ca. 0.5 mm. Anthers ca. 2.5 mm, basally distinctly subacute auriculate, appendages ovate-lanceolate; antheropodia rather short, markedly dilated in lower half. Style branches ca. 1 mm. Achenes cylindric, ca. 2 mm, pubescent in disk florets, longer and glabrous or rarely pubescent in ray florets. Pappus white, ca. 6 mm, persistent in disk florets, readily deciduous in ray florets. Fl. May–Jul. 2n = 40, 80.

Meadows, lax forests; 500–2000 m. Jiangsu, Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia (Siberia), Tajikistan, Uzbekistan; Europe].

The occurrence of Senecio jacobaea in Jiangsu is presumably the result of an introduction; this species was first recorded for this province by Kitamura.


岩生千里光组 yan sheng qian li guang zu

Madaractis Candolle, Prodr. 6: 439. 1838.

Herbs, perennial, erect, rhizomatous, with leafy stems. Leaves pinnately veined. Capitula radiate, erect. Anthers obtuse-auriculate; antheropodia rather slender, basally somewhat dilated. Achenes epidermal cells not papillose, cuticle thin; mechanical tissue in 5 somewhat distant tracts, bi-allantoid (shaped like 2 sausages joined) in cross section. Pappus absent from ray florets.
53. *Senecio wightii* (Candolle) Bentham ex C. B. Clarke, Compos. Ind. 197. 1876.

岩生千里光 yan sheng qian li guang

*Doronicum wightii* Candolle in Wight, Contr. Bot. India, 23. 1834; *Madaractis glabra* Candolle; *Senecio campyodontus* Franchet; *S.gentilianus* Vaniot; *S. saxatilis* Wallich ex Candolle.

Herbs, perennial, with slender rhizomes. Stem solitary, erect or ascending, 60–120 cm tall, simple or branched, glabrous or nearly so, rather slender. Basal leaves withered by anthesis; stem leaves 5–10 × 0.5–1.5 cm; lower leaves elliptic to narrowly oblong-lanceolate, 5–12 × 1–4 cm, leathery, abaxially scarious, acuminate, acute and shortly ciliate on upper margins and apex. Ray florets 8–13; corolla tube ca. 3.5 mm, pubescent near apex; lamina yellow, oblong, ca. 8 × 2.5 mm, 4-veined, apically obtuse, 3-denticulate. Disk florets many; corolla yellow, ca. 7 mm, with ca. 3.5 mm tube and funnelform limb; lobes ovate-lanceolate, ca. 1.2 mm, apically acute, papillose. Anthers ca. 2.3 mm, basally shortly caudate, tails to 0.25 × as long as antheropodia; slender; appendages ovate-oblong; antheropodia rather elongated, slightly dilated in lower half. Style branches ca. 1.2 mm. Achenes cylindric, ca. 3 mm, glabrous. Pappus white, ca. 5.5 mm. Fl. Oct–Nov. 2n = 20.

Wet places, by streams and ponds, roadsides; 1100–3000 m. Guangzhou, Sichuan, Yunnan [Bhutan, India, Myanmar, Thailand].

One of us (Nordenstam) recognizes this section as generically distinct from the genus *Madaractis*.

54. *Senecio stauntonii* Candolle, Prodr. 6: 363. 1838.

闽粤千里光 min yue qian li guang

Herbs, perennial, weakly erect or subscandent, rhizomatous. Stems erect or weakly ascending, flexuous, usually 30–60 cm tall, branched, angular, glabrous. Basal leaves soon withered; stem leaves numerous, sessile; blade ovate-lanceolate to narrowly oblong-lanceolate, 5–12 × 1–4 cm, leathery, abaxially laxly pilose mainly on veins to glabrous, axadially scattered pilose to glabrous, pinnately veined, lateral veins 14–18, base auriculate; auricle entire to dentate or shortly lacerate, semimplexicaud; blade margin revolute and shallowly obscurely to distinctly, rather remotely sinuate-dentate, rarely pinnatisect toward base, apex acute-acuminate or attenuate; upper leaves smaller and relatively narrower, otherwise similar. Capitula radiate, few to rather numerous, arranged in lax terminal coryombs; peduncles 1.5–3.5 cm, glabrous or sparsely puberulent, basally bracteate, with a few linear-subulate bracteoles. Involucres campanulate, ca. 7 × 5–7 mm, calyculate; bracts of calyculus 6–8, linear-subulate, 2–3 mm, puberulent, apically acute; phyllaries 13, linear-lanceolate, 1–1.5 mm wide, herbaceous, glabrous or sparsely puberulent near apex, margin narrowly scarious, acuminate, acute and shortly ciliate on upper margins.

Fl. Aug–Nov. 2n = 20.

About 12 species: S and SE Asia; one species in China.

One of us (Nordenstam) recognizes the species of this section as the genus *Madaractis*.
Herbs, perennial, scandent, rhizomatous. Stems elongated, flexuous, 2–5 m, much branched, pubescent or glabrous, becoming woody and with pale bark when old. Leaf petiole 0.5–1(–2) cm, pubescent or subglabrous, base not auriculate or with small auricle; blade ovate-lanceolate to narrowly triangular, 2.5–12 × (1.5–)2–4.5 cm, both surfaces shortly pubescent to glabrous, pinnately veined, base broadly cuneate, truncate, hastate, or rarely cordate, margin rarely subentire, usually shallowly or deeply dentate, sometimes lobulate or pinnatifid, at least toward base, with 2–6 smaller lateral lobes, apex acute-acuminate. Upper leaves smaller, lanceolate or linear-lanceolate, apically attenuate. Capitula radiate, numerous, arranged in abundant, diversely branching, terminal compound thyrses; branches and peduncles densely to sparsely puberulent; peduncles 1–2 cm, bracteate, usually with 1–10 linear-subulate bracteoles. Involucres cylindric-campanulate, 5–8 × 3–6 mm, calyculate; bracts of calyculus ca. 8, linear-lanceolate, ca. 1 mm, obtuse-lanceolate; au- ricles ca. 1/7 as long as antheropodia; antheropodia elongated, basally slightly dilated. Style branches ca. 0.8 mm. Achenes cylindric, pubescent, basally slightly attenuate. Pappus white, 3.5–4.5 mm.

- Rocky limestone ridges; 1000–2000 m. Taiwan.


Herbs, perennial, scandent, rhizomatous. Stems elongated, flexuous, 2–5 m, much branched, pubescent or glabrous, becoming woody and with pale bark when old. Leaf petiole 0.5–1(–2) cm, pubescent or subglabrous, base not auriculate or with small auricle; blade ovate-lanceolate to narrowly triangular, 2.5–12 × (1.5–)2–4.5 cm, both surfaces shortly pubescent to glabrous, pinnately veined, base broadly cuneate, truncate, hastate, or rarely cordate, margin rarely subentire, usually shallowly or deeply dentate, sometimes lobulate or pinnatifid, at least toward base, with 2–6 smaller lateral lobes, apex acute-acuminate. Upper leaves smaller, lanceolate or linear-lanceolate, apically attenuate. Capitula radiate, numerous, arranged in abundant, diversely branching, terminal compound thyrses; branches and peduncles densely to sparsely puberulent; peduncles 1–2 cm, bracteate, usually with 1–10 linear-subulate bracteoles. Involucres cylindric-campanulate, 5–8 × 3–6 mm, calyculate; bracts of calyculus ca. 8, linear-subulate, 2–3 mm; phyllaries 12 or 13, linear-lanceolate, herbaceous, puberulent or glabrous, 3-veined, margin broadly scarious, acuminate and ciliate-puberulent on upper margins and apex. Ray florets 8–10; corolla tube ca. 4.5 mm; lamina yellow, oblong–linear, 9–10 × ca. 2 mm, 4-veined, apically obtuse, 3-denticulate. Disk florets many; corolla yellow, ca. 7.5 mm, with ca. 3.5 mm tube; lobes ovate-oblong, apically acute, papillate. Anthers ca. 2.3 mm, basally obtuse-auriculate; auricles ca. 1/7 as long as antheropodia; appendages ovate-lanceolate; antheropodia elongated, basally slightly expanded. Style branches ca. 1.8 mm. Achenes cylindric, ca. 3 mm, pubescent. Pappus white, 7.5 mm. Fl. Aug–Apr or Oct–Dec. 2n = 20.

Climbing in forests and thickets, on shrubs, over rocks, on buildings, by streams, mountain slopes; sea level to 4000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Qinghai, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, Cambodia, India, Japan, Laos, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam].

1a. Leaf blade 2–3.5 × ca. 1.5 cm, thick in texture, triangular, incised-dentate with broad triangular teeth, sometimes lobulate toward base; fl. Oct–Dec ......................... 57c. var. crataegifolius

1b. Leaf blade 2.5–12 × 2–4.5 cm, ovate-lanceolate to lanceolate, dentate or pinnatifid; fl. Aug–Feb or to Apr.

2a. Leaf blade simple, subentire to dentate, unlobed and without small lateral lobes at base; fl. Aug–Apr ........................... 57a. var. scandens

2b. Leaf blade pinnatifid, or with large terminal lobe and 2–6 small lateral lobes at base; fl. Aug–Feb ............... 57b. var. incisus

57a. Senecio scandens var. scandens

千里光原变种 qian li guang (yuan bian zhong)

Cineraria chinensis Sprengel; C. repanda Loureiro (1790),
not (J. R. Forster & G. Forster) G. Forster (1786); Senecio cam-
pylodes Candolle; S. chinensis (Sprengel) Candolle; S. hindii Bentham; S. intermedium Wight; S. solanifolius Jeffrey; S. stipu-
latus Wallich ex Candolle; S. wightianus Candolle.

Leaf blade simple, subentire to dentate, unlobed and with-

Climbing in forests and thickets, on shrubs, over rocks, by streams; sea level to 3000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Bhutan, S India, Nepal, Sri Lanka].


缺裂千里光 que lie qian li guang

Senecio flexicaulis Edgeworth.

5. Senecio sect. Senecio

千里光组 qian li guang zu

Herbs, annual (in China), erect. Leaves usually pinnately divided. Capitula radiate or discoid. Phyllaries free or connate. Anthers obtusely ± auriculate at base; antheropodia small, basally somewhat to distinctly dilated. Achenes epidermal cells papillose, cuticle thin, mechanical tissues in 9–11 distinct tracts, elliptic in cross section. Pappus often dimorphic, with apically fluked as well as tapered hairs, present in all florets.

Maybe ca. 1,000 species: worldwide (except Antarctica); eight species (two endemic) in China.


近全缘千里光 jin quan yuan qian li guang

Senecio coronopifolius N. L. Burman var. subdentatus (Ledebour) Boissier.

Herbs, annual. Stems erect, 5–25 cm tall, slender, branched from base or middle, branches ascending, glabrous. Leaves sessile; blade oblong or broadly linear, 2.5–6.5 × 0.2–1 cm, gla-

Leaves pubescent or glabrous, with a few linear-subulate bracteoles.

Involucres narrowly campanulate, 4–5 × 2–4 mm, calyculate; bracts of ca-
ylculus 8–10, linear-subulate, blackish tipped; phyllaries 15–20, linear-lanceolate, ca. 0.5 mm wide, herbaceous, glabrous, apically acute and sparsely shortly puberulent. Ray florets many; corolla yellow, 4.5–5 mm, with ca. 2 mm tube and funnelliform limb; lobes oblong, ca. 0.7 mm, acutely acute. Anthers ca. 1.7 mm, basally obtuse-auriculate, appendages ovate-lanceolate; antheropodia rather stout, basally markedly dilated. Style branches ca. 0.6 mm. Achenes cylindrical, ca. 3.5 mm, densely pubescent. Pappus white, 5–6 mm. Fl. May–Jun.

Gravelly places; 400–700 m. Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia (SC Siberia), Tajikistan, Turkmenistan, Uzbekistan; SW Asia (S Caucasus)].

Leaf blade pinnatifid, or with large terminal lobe and 2–6 small lateral lobes at base. Fl. Aug–Feb.

Climbing on shrubs, in thickets, over rocks; sea level to 4000 m. Gansu, Guangdong, Guizhou, Jiangxi, Qinghai, Shaanxi, Si-

Mountain slopes, climbing on shrubs; 2100–2900 m. Taiwan.


苞叶千里光 bao ye qian li guang

Senecio coronopifolius Desfontaines, Fl. Atlant. 2: 273. 1799, not N. L. Burman (1768); S. glaucus Linnaeus subsp. co-

Herbs, annual. Stems erect or subdecumbent, 10–25 cm tall, usually branched from base or middle; branches erect or di-

Involucres narrowsly campanulate, 4.5–5 mm, calyculate; bracts of calyculus 8–10, linear-subulate, blackish tipped; phyllaries 15–20, linear-lanceolate, ca. 0.5 mm wide, herbaceous, glabrous, apically acute and sparsely shortly puberulent. Ray florets 8–12; corolla tube ca. 3 mm; lamina yellow, elliptic-oblong, ca. 6 × 2.5–3 mm, 4-veined, acutely acute, 3-denticulate, becoming revolute. Disk florets many; corolla yellow, ca. 5.5 mm, with 2–2.5 mm tube and funnelliform limb; lobes ovate-

Leaf blade small, usually 2–3.5 × ca. 1.5 cm, thick in texture, triangular, incised-dentate with broad triangular teeth, sometimes lobulate toward base. Fl. Oct–Dec.

● Mountain slopes, climbing on shrubs; 2100–2900 m. Taiwan.


山楂叶千里光 shan zha ye qian li guang

Senecio crataegifolius Hayata, Icon. Pl. Formosan. 8: 67. 1919.

Leaf blade small, usually 2–3.5 × ca. 1.5 cm, thick in texture, triangular, incised-dentate with broad triangular teeth, sometimes lobulate toward base. Fl. Oct–Dec.

● Mountain slopes, climbing on shrubs; 2100–2900 m. Taiwan.
Achenes cylindric, ca. 3 mm, shortly adpressed pubescent. Pappus white, ca. 4.5 mm. Fl. Jul–Aug. 2n = 20.

Gravelly places by streams; 3100–4600 m. Xizang (Ngari) [NW India, Kashmir; N Africa, SW Asia, Macaronesia (Canary Islands)].


细梗千里光 xi geng qian li guang


Herbs, annual. Stems erect, 5–30 cm tall, branching from base or in upper part; branches erect or divaricate-spreading, slender, sparsely pubescent or subglabrous. Leaves sessile; blade ovate-oblong, 1.5–5 × 0.4–1.5 cm, both surfaces sparsely pubescent to subglabrous, base slightly dilated and subamplexicaul, pinnatifid to finely and deeply pinnatisect with 4–8 usually narrow, linear, irregularly denticulate or entire lateral lobes, apex obtuse to subacute. Upper leaves smaller, pinnately lobed to linear and subentire. Capitula radiate, few to many, terminal, linear cylindric, ca. 0.5 mm, apically subobtuse. Anthers ca. 0.5 mm, basally shortly obtuse-auriculate, appendages ovate-lanceolate; antheropodia slender, dilated toward base. Style branches ca. 0.5 mm. Achenes cylindric, ca. 0.5 mm, densely pubescent. Pappus white, 7–7.5 mm. Fl. May–Sep.

Sandy and rocky places, field margins; 2000–4800 m. Gansu, Hebei, Nei Mongol, Qinghai, Shaanxi, Xinjiang, Xizang [NW India, Kashmir, Kyrgyzstan, Mongolia, Pakistan, Russia (E and W Siberia), Tajikistan, Uzbekistan].


欧洲千里光 ou zhouti li guang

Herbs, annual. Stems erect, 12–45 cm tall, branching from base or middle, sparsely arachnoid to glabrous. Leaves sessile; blade oblong-lanceolate-or oblong, 3–11 × 0.5–2 cm, ± arachnoid especially abaxially, to glabrous, shallowly to deeply pinnatifid with 6–8 oblong or oblong-lanceolate, usually irregularly dentate lateral lobes, lower ones attenuate into a petioloide base, middle ones subamplexicaul, apically obtuse; upper leaves smaller. Capitula discoid, few to many in dense terminal coryms; peduncles 0.5–2 cm, sparsely pubescent or glabrous, with a few linear-subulate bracteoles. Involucres campanulate, 6–7 × 2.5–4 mm, calyculate; bracts of calyculus 7–11, linear-subulate, usually irregularly dentate lateral lobes, lower ones attenuate into a petioloide base, middle ones subamplexicaul, apically obtuse; upper leaves smaller. Capitula discoid, few to many in dense terminal coryms; peduncles 0.5–2 cm, sparsely pubescent or glabrous, with a few linear-subulate bracteoles. Involucres campanulate, 6–7 × 2.5–4 mm, calyculate; bracts of calyculus 7–11, linear-subulate, 2–3 mm, usually with long black tips; phyllaries 18–22, linear, ca. 0.5 mm wide, herbaceous, with shallowly to deeply pinnatisect margins, glabrous, apically acute and blackish. Ray florets absent. Disk florets many; corolla yellow, 5–6 mm, with 3–4 mm tube and funneliform limb; lobes ovate, ca. 0.3 mm, apically obtuse. Anthers ca. 0.7 mm, basally shortly obtuse-auriculate, appendages ovate; antheropodia slender, dilated toward base. Style branches ca. 0.5 mm. Achenes cylindric, 2–2.5 mm, pubescent on ribs. Pappus white, 6–7 mm. Fl. Apr–Oct. 2n = 40.

Distanted open places; 300–2300 m. Guizhou, Jilin, Liaoning, Nei Mongol, Sichuan, Taiwan, Xizang, Yunnan [Mongolia; throughout temperate N and S Africa, Asia, and Europe; widely adventive].


散生千里光 san sheng qian li guang

Herbs, annual. Stems erect, 20–40 cm tall, branching from base or only in upper part, sparsely pubescent or subglabrous. Leaves sessile; blade oblong-lanceolate to oblong, 4–6 × 0.5–3.5 cm, both surfaces sparsely pubescent to glabrous, lower ones attenuate into a petioloide base, middle ones dilated with entire or dentate subamplexicaul auricles at base, pinnatifid with 6–8 unequal, oblong-lanceolate or oblong, obtuse, entire or re-
motely denticulate lateral lobes to pinnatifid or entire, apex obtuse. Upper leaves linear or linear-lanceolate, gradually smaller. Capitula radiate, few to numerous in lax terminal sometimes subumbelliform cymes; peduncles 0.5–2.5 cm, slender, glabrous; bracteoles 1–3, linear-subulate. Involucres subcampanulate, 4–5 × 2–3 mm, inconspicuously calculeate; bracts of calyculus 2 or 3, linear-subulate, minute; phyllaries 14 or 15, linear, 0.3–0.5 mm wide, herbaceous, glabrous, margin broadly hyaline, apically acute and sparsely puberulent. Ray florets ca. 12; corolla tube ca. 2 mm; lamina yellow, oblong, minute, 1–1.5 mm, 3-denticulate. Disk florets many; corolla yellow, ca. 3.5 mm, with ca. 2 mm tube and narrowly funnelform limb; lobes ovate-triangular, ca. 0.5 mm, apically subobtuse. Anthers ca. 0.8 mm, basally very shortly obtuse-aauriculate, appendages ovate; antheropodia dilated toward base. Style branches ca. 0.3 mm. Achenes cylindric, 2.5–2.8 mm, sparsely minutely pubescent. Pappus white, ca. 3 mm, bristles expanded at base. Fl. May.

- Open wet pastures; 1500–2400 m. NW Yunnan.


永宁千里光 yong ning qian li guang
Herbs, annual, dwarf. Stems 5–12 cm tall, much branched from base; branches spreading, ascending, glabrous. Leaves sessile; blade oblanceolate, 2–3.5 × 0.5–1 cm, glabrous, base scarcely auriculate, margin irregularly coarsely dentate or pinnatifid with 4–6 shortly triangular-oblong to linear-oblong obscurely denticulate lateral lobes, apex obtuse; upper leaves smaller. Capitula minutely radiate, solitary, axillary, subsessile. Involucres narrowly ovoid, 5–6 × 2–3 mm, contracted toward apex, minutely calyculate; bracts of calyculus 2 or 3, linear or linear-subulate, apically obtuse; phyllaries 8–14, oblance-linear, ca. 0.5 mm wide, connate except at apex, herbaceous, apically triangular, rather obtuse, puberulent. Ray florets ca. 7; corolla tube ca. 1.5 mm; lamina yellow, oblong, minute, ca. 0.5 mm, 3-veined, apically 2- or 3-lobulate. Disk florets 13–15; corolla yellow, ca. 2 mm, with ca. 0.7 mm tube and narrowly funnel-form limb; lobes ovate, ca. 0.3 mm, apically obtuse. Anthers ca. 0.5 mm, basally distinctly auriculate; appendages ovate; antheropodia short, basally dilated. Style branches ca. 0.3 mm. Achenes cylindric, 3–4 mm, glabrous. Pappus white, ca. 1.5 mm, bristles few, unequal. Fl. May–Jun.

- Lake and swamp margins; 2600–2800 m. Sichuan (Yongning).

109. CRASSOCEPHALUM Moench, Methodus, 516. 1794.

野茼蒿属 ye tong hao shu
Chen Yilin (陈艺林 Chen Yi-ling); Bertil Nordenstam, Charles Jeffrey

Herbs, annual or perennial. Leaves alternate. Capitula discoid or rarely radiate, often pendulous by anthesis, when discoid homogamous; florets numerous, bisexual. Involucre cylindric, calyculate; phyllaries uniserial, subequal, linear-lanceolate, with narrow scarious margins, erect at anthesis, later spreading and reflexed; receptacle flat, glabrous, areolate. Corolla finely tubular, upper part gradually expanded into a short limb; lobes 5. Anthers obtuse or auriculate at base. Style branches slender, papillose, with a short to long appendage of fused papilae. Achenes narrowly cylindric, ribbed, with gray-white ring at apex. Pappus hairs fine, numerous, white, early deciduous.

About 21 species: mainly in tropical Africa; two species (both introduced) in China.

1a. Capitula several to numerous in terminal corymbose cymes, shortly pedunculate; corollas dull orange to brick red .................................................................................................................. 1. C. crepidioides

1b. Capitula 1–8, solitary on long peduncles; corollas blue, purple, or magenta, rarely pink or red ............................................. 2. C. rubens

1. Crassocephalum crepidioides (Bentham) S. Moore, J. Bot. 50: 211. 1912.

野茼蒿 ye tong hao
Plants erect, 20–120 cm tall. Stems striate, glabrous. Leaf
petiole 2–2.5 cm; blade elliptic or obl-long-elliptic, 7–12 × 4–5
cm, margin irregularly serrate or double-serrate, sometimes
pinnately lobed at base, apex acuminate. Capitula several to
numerous in terminal corymbose cymes, shortly pedunculate,
3–5 mm in diam. Involucres cylindric, 1–1.2 cm, basally 
truncate, with few unequal linear bracteoles; bracts of calyculus 6–
21, 2–6 mm; phyllaries uniseriate, linear-lanceolate, equal, ca.
1.5 mm wide, margin narrowly scarious, apically puberulent.
Florets tubular, bisexual; corolla red-brown or orange,
rarely yellow, 8–10 mm; lobes 5, ca. 1 mm. Style branches
acute, pappillose. Achenes brownish, narrowly oblong, 1.8–2.3

Slopes, roadsides, stream-sides, thickets; 300–1800 m. ?Anhui, Fu-
jian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Hubei, ?Jiangsu,
Jiangxi, ?Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, ?Zhejiang [native
to Africa; pantropical weed of Africa, S and SE Asia, Australia, Central
and South America, and Pacific islands].

_Crasseocephalum crepidioides_ is used medicinally to invigorate the
spleen and treat indigestion; the young leaves are an edible wild veg-
etable.

2. _Crasseocephalum rubens_ (Jussieu ex Jacquin) S. Moore, J.
Bot. 50: 212. 1912.

About five species: mainly in the Americas; two species (both introduced) in China.

1a. Stems pubescent; leaves sessile, basally gradually attenuate or subamplexicaul, margin irregularly coarsely
dentate; pappus white ........................................................................................................................................ 1. _E. hieracifolius_

1b. Stems subglabrous; leaves petiolate, narrowly winged, margin irregularly doubly serrate or pinnately
divided; pappus reddish ........................................................................................................................................ 2. _E. valerianifolius_

1. _Erechites hieracifolius_ (Linnaeus) Rafinesque ex Cand-
dolle, Prodr. 6: 294. 1838 [”hieracifolia”].

_梁子菜_ liang zi cai

_Senecio hieracifolius_ Linnaeus, Sp. Pl. 2: 866. 1753
[”hieracifolia”].

_Herbs, annual. Stem solitary, erect, 40–100 cm tall, simple
or much branched in upper part, striate, sparsely pubescent.
Leaves sessile, winged; blade lanceolate to oblong, 7–16 × 3–4
cm, both surfaces glabrous or shortly pubescent on veins,
pinnately veined, basally gradually attenuate or subamplexi-
caul, margin irregularly coarsely dentate, apex acute or shortly
acuminate. Capitula numerous, arranged in terminal corymb,
capitula several to in terminal corymbose cymes, shortly pedunculate,
3–5 mm in diam. Involucres cylindric, 1–1.2 cm, basally
truncate, with few unequal linear bracteoles; bracts of calyculus 6–
21, 2–6 mm; phyllaries uniseriate, linear-lanceolate, equal, ca.
1.5 mm wide, margin narrowly scarious, apically puberulent.
Florets tubular, bisexual; corolla red-brown or orange,
rarely yellow, 8–10 mm; lobes 5, ca. 1 mm. Style branches
acute, pappillose. Achenes brownish, narrowly oblong, 1.8–2.3

Slopes, roadsides, stream-sides, thickets; 300–1800 m. ?Anhui, Fu-
jian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Hubei, ?Jiangsu,
Jiangxi, ?Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, ?Zhejiang [native
to Africa; pantropical weed of Africa, S and SE Asia, Australia, Central
and South America, and Pacific islands].

_Crasseocephalum crepidioides_ is used medicinally to invigorate the
spleen and treat indigestion; the young leaves are an edible wild veg-
etable.

2. _Crasseocephalum rubens_ (Jussieu ex Jacquin) S. Moore, J.
Bot. 50: 212. 1912.

About five species: mainly in the Americas; two species (both introduced) in China.

1a. Stems pubescent; leaves sessile, basally gradually attenuate or subamplexicaul, margin irregularly coarsely
dentate; pappus white ........................................................................................................................................ 1. _E. hieracifolius_

1b. Stems subglabrous; leaves petiolate, narrowly winged, margin irregularly doubly serrate or pinnately
divided; pappus reddish ........................................................................................................................................ 2. _E. valerianifolius_

1. _Erechites hieracifolius_ (Linnaeus) Rafinesque ex Cand-
dolle, Prodr. 6: 294. 1838 [”hieracifolia”].

_梁子菜_ liang zi cai

_Senecio hieracifolius_ Linnaeus, Sp. Pl. 2: 866. 1753
[”hieracifolia”].

_Herbs, annual. Stem solitary, erect, 40–100 cm tall, simple
or much branched in upper part, striate, sparsely pubescent.
Leaves sessile, winged; blade lanceolate to oblong, 7–16 × 3–4
cm, both surfaces glabrous or shortly pubescent on veins,
pinnately veined, basally gradually attenuate or subamplexi-
caul, margin irregularly coarsely dentate, apex acute or shortly
acuminate. Capitula numerous, arranged in terminal corymb,

1. _Erechites hieracifolius_ (Linnaeus) Rafinesque ex Cand-
dolle, Prodr. 6: 294. 1838 [”hieracifolia”].

_梁子菜_ liang zi cai

_Senecio hieracifolius_ Linnaeus, Sp. Pl. 2: 866. 1753
[”hieracifolia”].

_Herbs, annual. Stem solitary, erect, 40–100 cm tall, simple
or much branched in upper part, striate, sparsely pubescent.
Leaves sessile, winged; blade lanceolate to oblong, 7–16 × 3–4
cm, both surfaces glabrous or shortly pubescent on veins,
pinnately veined, basally gradually attenuate or subamplexi-
caul, margin irregularly coarsely dentate, apex acute or shortly
acuminate. Capitula numerous, arranged in terminal corymb,
2. *Erechtites valerianifolius* (Link ex Sprengel) Candolle, Prodr. 6: 295. 1838 ["valerianaefolia"].

败酱叶芹菜

*Seneio valerianifolius* Link ex Sprengel, Syst. Veg. 3: 565. 1826 ["valerianaefolia"].

Herbs, annual. Stems erect, 50–100 cm tall, simple or branched in upper part, strigate, subglabrous. Leaves long petiolate; petiole narrowly winged; blade oblong to elliptic, both surfaces glabrous, pinnately veined, margin irregularly double serrate or pinnatifid; lobes 12–16, lanceolate, acuminate, serrate to irregularly lobed, apex acute or acuminate; upper leaves similar to median leaves but smaller. Capitula numerous, erect or pendulous, in terminal and upper axillary dense corymbose panicles, ca. 10 × 3 mm, with linear bracteoles. Involucres cylindric-campanulate; phyllaries uniseriate, 12–14[–16], linear, 7–8 × 0.5–0.75 mm, glabrous or sparsely puberulent, 4- or 5-veined, apically acute or acuminate. Florets numerous, yellowish purplish; outer florets uniseriate, biseriate, corolla filiform, apically 5-denticulate; central florets minutely tubular-funnelform, 7–8 mm, rather longer and broader than outer ones, 5-denticulate, apically glandular thickened. Style branches with conical appendages. Achenes cylindric, 2.5–3.5 mm, glabrous or puberulent, 10–12-ribbed. Pappus reddish, as long as florets. Fl. year-round. 2n = 40.

Roadsides, field margins; ca. 1700 m. Guangdong, Hainan, Taiwan [native to tropical America; a pantropical weed].


菊三七属 芹三七

*Chen Yilin (陈艺林 Chen Yi-ling); Bertil Nordenstam*

Herbs, perennial, sometimes subsucculent, rarely subshrubs, glabrous or hispid. Leaves alternate, dentate or pinnately divided, rarely entire, petiolate or sessile. Capitula discoid, homogamous, solitary or few to numerous corymbose. Involucres campanulate or cylindric, with many linear bracteoles at base; phyllaries uniseriate, 9–13, lanceolate, equal, imbricate, with scarious margins. Receptacle flat, areolate or shortly fimbriate. All florets bisexual, fertile; corolla yellow or orange, rarely purplish, tubular, with slender tube and narrowly campanulate limb, lobes 5. Anthers entire or subauriculate at base. Style branches slender, appendages subulate, papilllose. Achenes cylindric, 10-ribbed, glabrous or puberulent, truncate at both ends. Pappus white, sericeous. 

About 40 species: Africa, Asia, Australia; ten species (one endemic) in China.

Besides the species enumerated below, *Gynura aurantiaca* (Blume) Candolle (Prodr. 6: 300. 1838), a native of Indonesia, is cultivated in gardens as an ornamental.

1a. Roots dilated into tuberiform rhizomes.

2a. Scapigerous herbs; flowering stem simple, 20–50 cm tall; leaves crowded at base, rosulate, obovate, spatulate, or elliptic, marginally repand-dentate or pinnatifid; petioles basally not auriculate; capitula 1–5, in lax corymb .......................... 1. *G. pseudochina*

2b. Robust herbs, to 150 cm tall, much branched; stem leaves numerous, lyrate-pinnatipartite to pinnatifid; petioles basally rounded, with pinnatifid auricles; capitula numerous, corymbose-paniculate ............................. 2. *G. japonica*

1b. Roots not dilated, not tuberiform.

3a. Scandent herbs; stems procumbent; leaves ovate or ovate-oblong, apically acute or acuminate, marginally entire or repand-dentate, both surfaces glabrous or sparsely hairy, base of petioles not auriculate; capitula 3–5 in terminal or axillary corymbs ................................................................. 10. *G. procumbens*

3b. Erect herbs or shrubs.

4a. Stem procumbent in lower part.

5a. Plants and phyllaries densely fulvous tomentose; leaves narrowly elliptic, ovate, or rhombic, margin entire or serrate in upper half; basally cuneate-attenuate into petiole; lateral veins 3–6-paired, both surfaces sparsely or densely shortly hairy ................................................................. 3. *G. nepalensis*

5b. Plants and phyllaries glabrous or subglabrous.

6a. Leaves sessile or subsessile, oblong-elliptic, obovate, or oblong-lanceolate, basally amplexicaul, with broad auricle, margin irregularly sharply serrate, lateral veins 12–30-paired; capitula 4–15, corymbose-paniculate ................................................................. 5. *G. cusimbua*

6b. Leaves petiolate, obovate or oblanceolate, basally cuneate, narrow, not auriculate, margin repand-dentate, or mucronulate, lateral veins 7–9-paired; capitula numerous, laxly corymbose ...... 4. *G. bicolor*

4b. Stem erect or declined at base.

7a. Leaves simple, elliptic, marginally entire or laxly denticulate, apex obtuse, base of petiole with incised auricle ................................................................. 9. *G. elliptica*

7b. Leaves marginally repand-dentate or lyrate pinnatipartite divided.

8a. Leaves usually crowded on lower part of stem, petiolate or subsessile, ovate, elliptic, or oblanceolate, veinlets coalescent into suboblong, parallel-reticulate, conspicuous black lines when dry; capitula 3–5 corymbose-paniculate, divaricate ............................................. 6. *G. divaricata*
8b. Leaves lax, rarely crowded on stem, elliptic or spatulate, veinlets inconspicuous, not coalescent into black lines when dry; capitula laxly corymbose, not divaricate.

9a. Plants hispid; leaves lyrate-ovate, basally attenuate into long petioles, upper or median leaves 1- or 2-denticulate, apically obtuse, both surfaces adpressed pilose; capitula 3, laxly corymbose; peduncles 5–7 cm .................................................. 7. G. formosana

9b. Plants fulvous pubescent; leaves lyrate-pinnatifoliate, 4–12 cm, terminal lobe large, triangular-ovate, apex acuminate, base truncate or cordate, lateral lobes 1- or 2-paired, ovate-oblong, both surfaces fulvous pubescent; capitula 1–3, laxly corymbose; peduncles 1–3 cm .................................................. 8. G. barbareifolia


狗头七  gōu tou qi

Senecio pseudochina Linnaeus, Sp. Pl. 2: 867. 1753; Cacalia bulbosa Loureiro; Gynura bodinieri H. Léveillé; G. bulbosa (Loureiro) Hooker & Arnott; S. bulbosus (Loureiro) H. Léveillé (1916), not Schultz Bipontinus (1867); S. crassipes H. Léveillé & Vaniot.

Herbs, perennial, scapigerous, 20–50 cm tall, slightly fleshy. Roots globose or sometimes branched, tuberiform, (1–)2–6 cm in diam., fleshy, with many fibrous roots. Stems erect, 1–3, ascending or creeping, green or purplish, striate when dry, sparsely pubescent or glabrous. Leaves often crowded at base of stem, rosulate; petiole 0.5–3 cm, basally broad, slightly fleshy, not auriculate; blade abaxially often pinnatifid, adaxially green, obovate, spatulate, or elliptic, rarely ovate, 5–18 × 2.5–5 cm, both surfaces sparsely shortly pubescent or ± glabrescent, lateral veins 8–20-paired, to lobes or curved before margins, inconspicuous, base gradually attenuate into petiole, margin pinnatifid, rarely dentate; lobes triangular or ovate-oblong, entire or denticulate, apex obtuse or rather acute. Median or upper leaves reduced, or with 1 or 2 leaflets, shortly petiolate or subsessile; leaflets pinnatifoliate, lobes small, both surfaces pubescent. Capitula 1–5, 10–15 mm in diam., terminal, laxly corymbose; peduncles 0.5–4 cm, often with 1 or 2 linear or filiform-linear bracteoles, densely or sparsely pubescent. Involucres campanulate, 10–12 × 8–10 mm; bracts of calyculus 8, unequal, linear; phyllaries uniseriate, 13, green or purplish, linear-lanceolate or lanceolate, 7–12 × ca. 1.5 mm, conspicuously 1–3-ribbed, sparsely shortly pubescent, margin broadly scarious, apically acuminate. Florets yellow to reddish; corolla 10–13 mm, distinctly exceeding involucre, tube 7–9 mm, slender, expanded above; lobes ovate-triangular, apically obtuse. Anthers obtuse at base. Style branch tips conical, papillosate. Achenes red-brown, cylindrical, 3–4 mm, glabrous or puberulent, 10-ribbed. Pappus hairs numerous, white, 10–12 mm, sericeous, early deciduous. Fl. Apr–Nov. 2n = 20.

Sandy places on slopes, forest margins, roadsides; 200–2100 m. Guangdong, Guangxi, Guizhou, Hainan, Yunnan [Blutan, India, Myanmar, Nepal, Sri Lanka, Thailand; Africa; tropical Africa; cultivated in Indonesia (Java)].


菊三七  ju san qi

Senecio japonicus Thunberg in Murray, Syst. Veg., ed. 14, 756. 1784; Cacalia pinnatifida Loureiro; C. segement Loureiro; Gynura aurita C. Winkler; G. flava Hayata; G. japonica var. flava (Hayata) Kitamura; G. pinnatifida (Loureiro) Candolle; G. segemt (Loureiro) Merrill; G. vaniotii H. Léveillé; Kleinia japonica (Thunberg) Lessing.

Herbs, perennial, high and robust, 60–100 cm or taller. Roots thick, tuberiform, 3–4 cm in diam., with numerous fibrous roots. Stems erect, basally woody, ca. 15 mm in diam., conspicuously canaliculate, crisped-pubescent when young, glabrescent, much branched, branchlets ascending. Basal leaves often withered and shedding by anthesis. Basal and lower leaves smaller, elliptic, simple to lyrate-pinnatifoliate, terminal lobe large. Median leaves long or shortly petiolate, large; petiole basally rounded, dentate or pinnatifoliate, auriculate, semiamplexicaul; blade abaxially green or becoming purplish, adaxially green, elliptic or oblong-elliptic, 10–30 × 8–15 mm, adpressed pilose or subglabrous, pinnatipartite; terminal lobe large, obovate or oblong to oblong-lanceolate; lateral lobes (4–)6–12-paired, elliptic or oblong to oblong-linear, 1.5–5 × 0.5–2.5 cm, margin unequally coarsely dentate or sharply serrate, incised, rarely entire, apex acute or acuminate. Upper leaves smaller, pinnatifoliate, gradually reduced to bractiform leaves upward. Capitula numerous, 1.5–1.8 cm in diam., terminal, corimbosely-paniculate; peduncles 1–3(–6) cm, slender, shortly pubescent; bracts 1–3, linear. Involucres narrowly campanulate or campanulate, 10–15 × 8–15 mm; bracts of calyculus 9–11, linear; phyllaries uniseriate, 13, linear-lanceolate, 10–15 × 1.5–1.5 mm, glabrous or sparsely hairy, margin scarious, apically acuminate. Florets 50–100; corolla yellow or orange, 13–15 mm; tube 10–12 mm, slender, dilated above; lobes ovate, apically acute. Anthers obtuse at base. Style branches with conical papillosTe appendages. Achenes brownish, cylindrical, 4–5 mm, puberulent, 10-ribbed. Pappus white, silky, easily deciduous. Fl. Aug–Oct.

Valleys, grassy slopes, forests, forest margins; 1200–3000 m. Anhui, Fujian, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan, Nepal, Thailand].

The roots are used in Chinese medicine.

3. Gynura nepalensis Candolle, Prodr. 6: 300. 1838.

尼泊尔菊三七  ni bo er ju san qi


Herbs, perennial. Stems erect or ascending, robust, 30–
45 cm tall, woody at base, ca. 10 mm in diam., corymbose branched in upper part, densely fulvous tomentose. Stem leaves numerous, absent on lower part of stem. Leaves petiolate, basally not auriculate; blade narrowly elliptic, ovate, or rhombic or oblong-lanceolate, 3–20 × 1–6 cm, lateral veins 3–6(–8)-paired, abaxially pubescent, adaxially gray-white sparsely or densely fulvous pubescent, base cuneately gradually attenuate to petiole, margin entire or serrate in upper half, rarely lobed, apex acute or acuminate. Upper leaves smaller, becoming bractlike, narrowly lanceolate-linear, sessile. Capitula numerous, ca. 10 mm in diam., usually in terminal elongate lax corymb; peduncles 1–10 cm, with few linear bracts, densely shortly pubescent. Involucres campanulate, 10–13 × ca. 10 mm, with 7 or 8 linear calycular bracts, densely shortly pubescent; phyllaries uniseri-papillose.

Involucres campanulate, 10–13 × ca. 10 mm, with 7 or 8 linear calycular bracts, densely shortly pubescent. Phyllaries 13–15, linear-lanceolate, ca. 10 × 1.5–2.5 mm, densely calycular bracts, densely shortly pubescent; phyllaries uniseri-papillose.

Involucres campanulate, 8–10 × 6–8 mm; bracts of calyculus 7–9, linear; phyllaries 13–15, linear or lanceolate, apex acuminate. Florets yellow; corolla 8–10 mm; tube 4–5 mm, slender; limb dilated, lobes triangular-ovate. Anthers obtuse at base. Style branch tips conical, papillose. Achenes cylindric, 3–4(–6) mm, glabrous or sparsely hairy, 10-ribbed. Pappus hairs numerous, white, 10–15 mm, silky, easily deciduous. Fl. May–Oct.

On rocks, field margins, by streams; 1100–2000 m. Guizhou, Yunnan [Bhutan, India, Kashmir, Myanmar, Nepal, Thailand].

红风菜 hong feng cai


Herbs, perennial. Stems erect, 50–100 cm tall, glabrous, flacide, rather woody at base, corymbose branched in upper part, striate when dry. Leaves petiolate or subsessile; blade abaxially becoming purplish when dry, adaxially green, obovate or oblanceolate, rarely oblong-lanceolate, both surfaces glabrous, lateral veins 7–9-paired, curved, base gradually attenuate into winged petioles or subsessile, ± expanded, but not auriculate, margin irregularly repand-dentate or mucronulate, rarely pinnatifid near base. Upper leaves shortly petiolate or subsessile, lanceolate to linear-lanceolate, small. Capitula numerous, ca. 10 mm in diam., in terminal lax corymb; peduncles 3–4 cm, slender, with 1 or 2(3) filiform bracts. Involucres campanulate, 11–15 × 8–10 mm; bracts of calycus 7–9, linear; phyllaries 13, linear-lanceolate, 11–15 × 0.9–1.5(–2) mm, glabrous, conspicuously 3-ribbed, margin scarios, apically acute or acuminate. Florets orange to reddish; corolla distinctly exceeding involucres, 13–15 mm; tube 10–12 mm, slender; lobes ovate-trianglular. Anthers rounded at base, or slightly acute. Style branch tips subulate, papillose. Achenes brownish, cylindric, ca. 4 mm, glabrous, 10–15-ribbed. Pappus white, silky, easily deciduous. Fl. May–Oct.

Forests on slopes, grasslands, roadsides; 1300–3400 m. Sichuan, Xizang, Yunnan [Bangladesh, Bhutan, India, Myanmar, Nepal, Thailand].

F. G. Davies (Kew Bull. 33: 629–640. 1999) includes *Gynura cusimbua* in her circumscription of *G. bicolor*, stating that they are intergrading in all characters. Intermediates are therefore to be expected.

木耳菜 mu er cai

*Cacalia cusimbua* D. Don, Prodr. Fl. Nepal. 179. 1825; *Gynura angulosa* Candolle.

Herbs, perennial, robust. Stems procumbent in lower part, erect above, green or purplish, 150–300 cm tall, 1.5–2 cm in diam., fleshy, wooly at base, much corymbose branched, consecutively camaluate, glabrous or ± hairy in upper part. Leaves large, sessile or shortly petiolate; blade abaxially sometimes becoming purplish, adaxially green, obovate, oblong-elliptic, elliptic, or oblong-lanceolate, (5–)10–30 × 4–11 cm, both surfaces glabrous, lateral veins 12–30-paired, base cuneately attenuate into short petiole or sessile with expanded semiamplexicaul broad auricle, margin irregularly sharply serrate, mucronulate, acuminate. Upper leaves smaller, oblong-lanceolate or lanceolate, apex long acuminate or caudate-acute. Capitula 10–12 mm in diam., usually 4–15 in terminal corymbose panicles; synflorescence branches unequal; peduncles 1.5–3 cm, slender, with 2 or 3 filiform-linear bracts, shortly pubescent. Involucres narrowly campanulate or cylindric, 12–17 × 8–12 mm; bracts of calycus 7–9, linear-filiform; phyllaries 13–15, linear or linear-lanceolate, 13–15 × 1–1.5 mm, glabrous or subglabrous, conspicuously 3-ribbed, margin scarios, apically acuminate. Florets ca. 50; corolla orange, 11–13 mm; tube 7–9 mm, slender, dilated in upper part. Achenes brownish, 4–4.5 mm, puberulent, 10-ribbed. Pappus hairs numerous, white, 10–15 mm, silky, easily deciduous. Fl. Sep–Oct.

Forests, slopes, grasslands, roadsides; 1300–3400 m. Sichuan, Xizang, Yunnan [Bangladesh, Bhutan, India, Myanmar, Nepal, Thailand].

白子菜 bai zi cai

*Senecio divaricatus* Linnaeus, Sp. Pl. 2: 866. 1753; *Ca- calia incana* Linnaeus; *C. ovalis* Ker Gawler; *Gynura auriculata* Cassini; *G. hemsleyana* L. Héville; *G. ovalis* (Ker Gawler) Candolle; *G. ovalis* var. *pinnatifida* Hemsl.; *G. panershenia* Z. Y. Zhu.

Herbs, perennial. Stems erect, or ± ascending from base, 30–60 cm tall, woody, striate when dry, simple or with synflorescence branched in upper part, glabrous or shortly pubescent, purplish. Leaves thick, usually crowded in lower part, petiolate or subsessile; petiole 0.5–4 cm, shortly pubescent, with ovate or half-moon-shaped, dentate auricle at base; blade abaxially purplish, adaxially green, ovate, elliptic, or oblanceolate, 2–15 × 1.5–5 cm, both surfaces shortly pubescent, with conspicuous black lines when dry, lateral veins 6–10-paired, veinlets often coalescent into subparallel oblong reticulate veins, base cuneate-attenuate or decurrent into petiole, subtruncate or slightly cordate, margin coarsely dentate, sometimes lyrate lobed, rarely entire, apex obtuse or acute. Upper leaves smaller, bractlike, narrowly lanceolate or linear, pinnatifid, sessile, semiamplexicaul. Capitula 1.5–2 cm in diam., usually (2 or)3–5 terminal laxly corymbose-paniculate, often divaricately branched; peduncles 1–15 cm, densely shortly pubescent; bracts 1–3, linear. Involucres campanulate, 8–10 × 6–8 mm; bracts of calycus

白凤菜 *bai feng cai*

*Gynura divaricata* (Linnaeus) Candolle subsp. *formosana* (Kitamura) F. G. Davies.

Herbs, perennial, subscapigerous. Stems procumbent, 30–80 cm, slightly procumbent from base, 6–10 mm in diam., canaliculate when dry, branched, glabrous or sparsely pubescent on synflorescence. Stem leaves numerous, thinly papery; lower and median leaf petioles 1–3 cm, incised-rounded auriculate at base; blade elliptic, 4–12 × 2–6 cm, both surfaces shortly pubescent, lateral veins 6–8–(12)–paired, curved, veinlets coalescent, reticulate, base rounded or cuneate, margin entire or laxly crenate, apex obtuse, mucronulate. Upper leaves bractlike, smaller, distinctly auriculate. Capitula 14–17 mm in diam., 2–5 in terminal lax corymbs; peduncles 6–23 mm, shortly pubescent in upper part. Involucres broadly campanulate, 8–9 × 14–17 mm, with many linear calycular bracts; phyllaries ca. 14, lanceolate, 8–12 × 1–1.3 mm, apically subtriangular, sparsely puberulent. Florets ca. 50, exceeding involucres; corolla yellow, 10–12 mm, with slender, 7–9 mm tube and dilated limb; lobes ovate, ca. 2 mm. Anthers obtuse at base. Style branches with lanceolate appendages, papillose. Achenes brownish, cylindric, glabrous or puberulent. Pappus white, silky, ca. 10 mm. Fl. May–Nov.

Valleys, seashores; sea level to 500 m. Taiwan [Philippines].


山芥菊三七 *shan jie ju san qi*

*Gynura divaricata* (Linnaeus) Candolle subsp. *barbareifolia* (Gagnepain) F. G. Davies; G *maclurei* Merrill.

Herbs, perennial. Stems erect or slightly curved, 30–80 cm tall, simple or branched, canaliculate. Leaves lax, rarely densely crowded; petiole auriculate at base; blade lyrate-pinnatifid divided, 4–12 cm, base attenuate into a lobed petiole; terminal lobe large, triangular-ovate, 3–7 × 2–5 cm, base truncate or subcordate, rarely cuneate, margin irregularly sharply serrate or lobulate, apex acuminate or rather obtuse; lateral lobes usually 2–4–

paired, opposite or alternate, ovate-oblong or oblong, entire or laxly dentate, 5–10 cm, not black when dry, fulvous-black, addressed shortly pubescent on both surfaces, lateral veins 6–8–paired, inconspicuously reticulate; auricles similar to lateral lobes. Capitula usually 1–3, in terminal lax corymbs; peduncles 1–3 cm, fulvous puberulent; bracts 1–3, linear. Involucres campanulate, 10–15 × 8–12 mm, with several calycular bracts; phyllaries ca. 13, linear-oblong, 9–12 × 1–1.5 mm, densely or sparsely puberulent, inconspicuously 3–veined, margin scarios, apically acuminate. Florets yellow; corolla 11–14 mm, with 9–11 mm slender tube and dilated limb; lobes ovate, apically acuminate, reddish tinged. Anthers obtuse at base. Style branch tips subulate, papillose. Achenes cylindric, 1.5–2.7 mm, 9–11-ribbed, puberulent between ribs. Fl. and fr. Apr.–May.

Rocky places and ravines in forests; sea level to 1500 m. Hainan, S Yunnan [N Vietnam].
ceolate, sessile or subsessile. Capitula 3–5 in each corymbs, in terminal or axillary corymbs; peduncles long, slender, often with 1–3 linear bracts, sparsely shortly pubescent or glabrous. Involucres campanulate or funnelform, 15–17 × 5–10 mm; bracteoles at base 5 or 6, linear; phyllaries (9 or)11–13, becoming purplish, oblong-lanceolate, 15–17 × ca. 1.5 mm, glabrous, 1–3-veined, margin narrowly scarious, apically acuminate. Florets 20–30; corolla orange, 12–15 mm, with slender 8–10 mm tube and dilated limb; lobes ovate-lanceolate, apically acute. Anthers obtuse at base, appendages triangular. Style branch tips conical, papillose. Achenes brown, cylindric, 4–6 mm, glabrous, 10-ribbed. Pappus white, silky. Fl. Mar–Apr. 2n = 20.

By streams in forests, sandy slopes, climbing on shrubs or trees; 200–900 m. ?Fujian, Guangdong, Guizhou, Hainan, Sichuan, Yunnan [Indonesia, Malaysia, Myanmar, Thailand, Vietnam; Africa].


一点红属 yi dian hong shu

Chen Yilin (陈艺林 Chen Yi-ling); Bertil Nordenstam, Charles Jeffrey

Herbs annual or perennial, with fibrous roots, mostly subglabrous. Stems erect, branched or simple. Leaves mostly radical, alternate, simple, petiolate or sessile. Capitula discoid or radiate, homogamous or heterogamous, in terminal corymbs, sometimes solitary, without calyculus. Involucres cylindric; phyllaries uniseriate, free or basally connate. Receptacle flat, glabrous. Ray florets yellow; disk florets bisexual, yellow, orange, red, purple, pinkish, pale mauve, or white; corolla with funnelform limb and 5, usually narrow, lobes. Anther obtuse or slightly sagittate at base. Style branches truncate to obtuse, often penicillate, or with an appendage of fused papilae. Achenes elliptic-oblong, 5-ribbed, glabrous or hairy between ribs. Pappus of numerous white, slender bristles.

About 100 species: palaeotropical; five species (one introduced) in China.

1a. Style branches ending in a conspicuous appendage; florets orange-red or scarlet, rarely yellow ......................... 1. E. coccinea
1b. Style branches truncate or subtruncate, or at most with a short conical appendage, without a conspicuous appendage of fused papilae; florets purplish. 2.

2a. Achenes glabrous; lower leaves entire or laxly dentate ........................................................................ 5. E. prenanthoidea
2b. Achenes pubescent; lower leaves lyrate lobed or strongly dentate.

3a. Florets cream, pallid yellow, or pale orange; corollas distinctly exceeding involucre ....................................... 4. E. praetemissa
3b. Florets purple or dull red, hardly or distinctly exceeding involucre.

4a. Lower leaves lyrate; involucres 3–4 × as long as broad, slightly shorter than or equaling corollas .... 2. E. sonchifolia
4b. Lower leaves strongly dentate; involucres 2–3 × as long as broad, ca. 3/4 as long as corollas ............. 3. E. fosbergii


绒缨菊 rong ying ju

Cacalia coccinea Sims, Bot. Mag. 16: t. 564. 1802; C. sagittata Willdenow (1803), not Vahl (1794); Emilia sagittata Candolle var. lutea L. H. Bailey.

Herbs, annual. Stems erect, 40–70(–100) cm tall, glabrous or hirsutulous. Basal and lower leaves shortly petiolate; blade oblong, obovate, or subspatulate, 5–7 × 2–2.5 cm, both surfaces puberulent, veins convex abaxially and conspicuously concave adaxially, base gradually attenuate, winged and semiaxilemicaul, margin entire or repand-denticulate, apex obtuse. Median stem leaves sessile, oblong or ovate-oblong, large, basally hastate and amplexicaul. Upper leaves smaller, lanceolate or oblong-lanceolate, basally auriculate and amplexicaul, apically acute. Capitula several in terminal corymb, 10–15 mm; peduncles 10–30 mm, not bracteate. Involucres urceolate or top-shaped, 10–12 × 9–12 mm, without bracts at base; phyllaries distinctly shorter than florets, 10–13, linear-lanceolate, glabrous, margin narrowly scarious, apically acuminate. Florets numerous, ca. 50; corolla scarlet, rarely yellow, tube slender; lobes 5, lanceolate, 1.6–2.2 mm. Achenes cylindric, ca. 3 mm, puberulent, 5-ribbed. Pappus white, ca. 4 mm. Fl. Jul–Nov. 2n = 10, 20.

Often cultivated as an ornamental plant in gardens in China [native to Africa; cultivated worldwide].


一点红 yi dian hong

Herbs, annual; root vertical. Stems erect or ascending, gray-green, 25–40 cm tall, rather curved, usually branching from base, glabrous or sparsely pilose. Leaves thick, lower leaves crowded, abaxially dark green, often becoming purple, lyrate-pinnaulobed, 5–10 × 2.5–6.5 cm; terminal lobe large, broadly ovate-triangular, margin irregularly dentate, apex obtuse or subrounded; lateral lobes usually paired, oblong or oblong-lanceolate, both surfaces crisped-hairy, margin shallowly and bluntly dentate, apex obtuse or acute. Median stem leaves lax, sessile, smaller, ovate-lanceolate or oblong-lanceolate, basally hastately semiaxilemicaul, margin entire or irregularly denticate, apically acute; upper leaves few, linear. Capitula pendulous before anthesis, erect later, usually 2–5, in terminal lax corymb; peduncles 2.5–5 cm, slender, not bracteate. Involucres cylindric, 6–12 × 1.5–4 mm; phyllaries 8 or 9, yellow-green, oblong-linear or linear, nearly equaling florets, glabrous, margin narrowly scarious, apically acuminate. Florets pink or purplish; corolla ca. 9 mm, with slender tube and dilated limb, deeply 5-lobed. Achenes cylindric, 3–4 mm, puberulent between ribs, 5-ribbed. Pappus of capillary-like bristles, snow white, ca. 8 mm. Fl. Jul–Oct. 2n = 10, 20.

Weedy slopes, roadsides, field margins, sandy places; sea level to
Emilia sonchifolia is used medicinally as an antiphlogistic and for dysentery.

1a. Corollas equaling or exceeding involucre by not more than 2 mm; corolla lobes 0.5–1.5 mm

2a. var. sonchifolia

1b. Corollas exceeding involucre by (2.5–)3–4 mm; corolla lobes 1.2–2.2 mm

2b. var. javanica

2a. Emilia sonchifolia var. sonchifolia

一点红(原变种) yi dian hong (yuan bian zhong)

Cacalia sonchifolia Linnaeus, Sp. Pl. 2: 835. 1753; Crassocephalum sonchifolium (Linnaeus) Lessing; Emilia sinica Miquel; Senecio sonchifolius (Linnaeus) Moench.

Involucres 6–12 × 1.5–3.5 mm. Corollas equaling involucre or exceeding it by not more than 2 mm; corolla lobes 0.5–1.5 mm. 2n = 10.

Weedy slopes, roadsides, field margins; 800–2100 m. Anhui, Fujian, Guangdong, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [pantropical].


紫背草 zhi bei cao

Hieracium javanicum N. L. Burman, Fl. Indica, 174. 1768; Emilia flammea Cassini; E. javanica (N. L. Burman) C. B. Robinson; E. sagittata Candolle; E. taiwanensis S. S. Ying.

Involucres 6–12 × 2–4 mm. Corollas exceeding involucre by (2.5–)3–4 mm; corolla lobes 1.2–2.2 mm. 2n = 20.

Weedy places, roadsides, field margins, sandy places; sea level to 900 m. Anhui, Fujian, Guangdong, Hainan, Hunan, Taiwan, Zhejiang [Japan; islands of S Pacific from Indonesia to E Polynesia].


缨荣草 ying rong hua

Herbs, annual. Stems erect or ascending, 20–60(–100) cm tall, glabrous or sparsely pilose. Basal and lower stem leaves petiolate; blade ovate, ± dentate, strongly decurrent into petiole; median stem leaves oblong-oblong-lanceolate, base semiamplexicaul-hastate, margin shallowly to deeply dentate, apically acute; upper leaves ovate to lanceolate, dentate or entire, becoming bracteiform upward. Capitula in lax compound corymb. Involucres cylindric to subcylindric, ca. 15 × 5 mm; phyllaries ca. 10. Florets definitely exceeding involucre at anthesis; corolla dull red, with slender tube and cylindric limb; lobes 1–1.5 mm. Achenes ca. 5 mm, pubescent between ribs. Pappus white. 2n = 20.

Waste places. Taiwan [tropical Pacific islands, Neotropics].

In spite of suggestions in the literature of an African origin, Emilia fosbergii does not occur in Africa.


黄背紫草 huan hua zi bei cao

Herbs, annual. Stems erect or ascending, to 140 cm tall, glabrous or pilose. Basal and lower stem leaves petiolate; petiole 1.5–3 cm, in basal leaves unwinged and exaericate, in lower stem leaves winged and basally auriculate; blade broadly ovate, 4–6 × 4.5–6 cm, ± pilose, base subcordate, margin dentate, apically obtuse; median and upper stem leaves sessile, pandurate to triangular, becoming smaller upward. Capitula up to 7 in lax corymb, rarely solitary. Involucres cylindric, ca. 10 × 3–4 mm; phyllaries 9–12. Florets distinctly exceeding involucre; corollas cream, yellowish, or pallid orange, ca. 8 mm; lobes ca. 2 mm, tinged purple or orange. Achenes ca. 3 mm, pubescent. Pappus ca. 7 mm. 2n = 20.

Disturbed places. N Taiwan [W tropical Africa].

Emilia praetermissa is presumably introduced, an allotetraploid of hybrid origin (Emilia sonchifolia var. sonchifolia × E. lisonoskiiana C. Jeffrey, the latter previously identified as E. coccinea).

5. Emilia prenanthoidea Candolle, Prodr. 6: 302. 1838.

小一点红 xiao yi dian hong

Emilia angustifolia Candolle.

Herbs, annual. Stems erect or ascending, 30–90 cm tall, glabrous or sparsely pilose. Basal leaves obovate or obovate-oblong, small, base gradually attenuate into long petiole, margin entire or laxly dentate, apex obtuse. Median leaves sessile, abaxially sometimes purplish, adaxially green, oblong or linear-oblong, 5–9 × 1–3 cm, glabrous or subglabrous, base semiamplexicaul, hastate or auriculate, margin repand-dentate, apex obtuse or acute. Upper leaves linear-lanceolate, small. Capitula arranged in terminal lax corymb; peduncles 3–10 cm, slender. Involucres cylindric or narrowly campanulate, 6–11 × 2–3 mm; phyllaries 10, oblong, 6–12 × 1–2 mm, shorter than florets, glabrous, margin scarious. Florets red or purple-red; corolla ca. 10 mm, tube slender, limb 5-lobed; lobes lanceolate, 2–3 mm. Style branches apically thickened. Achenes cylindric, ca. 3 mm, glabrous, 5-ribbed. Pappus of capillary-like bristles, soft, white. Fl. and fr. May–Oct.

Roadsides on slopes, lax forests, wet places in forests; 500–2000 m. Fujian, Guangdong, Guangxi, Guizhou, Sichuan, Yunnan, Zhejiang [India, Indonesia, Malaysia, New Guinea, Philippines, Thailand, Vietnam].

113. PERICALLIS D. Don in Sweet, Brit. Fl. Gard. 6: t. 228. 1834.

瓜叶菊属 gua ye ju shu

Chen Yilin (陈艺林 Chen Yi-ling); Bertil Nordenstam

Shrubs, subshrubs, or perennial herbs, gray-white tomentose or glabrous. Leaves alternate on stem, margin obtusely dentate to

(SENECIONEAE 543)
sharply serrate, palmately veined. Capitula numerous, corymbose, rarely solitary, heterogamous, radiate. Involucres not calyculate, campanulate; phyllaries 1-seriate, equal, margin membranous, apically obtuse or acute. Receptacle flat, without paleae. Ray florets radiate, female, fertile, variously colored but not yellow; central florets bisexual; corolla tubular with campanulate limb, white, cream-colored, or pink (never yellow), 5-lobed. Anthers not caudate, obtuse or sagittate at base; endothecial tissue polarized; antheropodium balusterform (basally distinctly enlarged). Style branches linear with separated stigmatic areas, apically truncate, with short sweeping hairs. Achenes terete (not compressed), elliptic-oblong, glabrous or puberulent, ribbed. Pappus of many fine caducous bristles, sometimes absent in ray florets. \( x = 30 \).

Fifteen species: Macaronesia (Azores, Canary Islands, Madeira), one species widely cultivated including in China.


瓜叶菊 **guā yè jú**

_Cineraria hybrida_ Willdenow, Enum. Pl. 2: 893. 1809, not Bernhardi (1800).

Herbs, perennial. Stems erect, 30–70 cm tall, sparsely to densely white pubescent. Leaf petiole 4–10 cm, basally expanded and amplexical; blade abaxially green, adaxially gray-white, reniform to broadly corymbose, some upper leaves triangular-cordate, large, 10–15 × 10–20 cm, densely tomentose, palmately veined, concave abaxially, convex adaxially, base deeply cordate, margin irregularly deltoid-lobed or obtusely dentate, apex acute or acuminate. Uppermost leaves subsessile, smaller. Capitula numerous, terminal, broadly corymbose, 3–5 cm in diam.; peduncles 3–6 cm, coarse. Involucres campanulate, 5–10 × 7–15 mm; phyllaries 1-seriate, lanceolate, apically acuminate. Ray florets purple-red, blue, pink, or whitish; lamina spreading, narrowly elliptic-oblong, 2.5–3.5 × 1–1.5 cm, apically 3-denticulate. Disk florets white, cream-colored, or pink (never yellow), ca. 6 mm. Achenes oblong, 1.5–2 mm, angled or ribbed, at first hairy, glabrescent. Pappus of capillary-like bristles, white, 4–5 mm. Fl. and fr. Mar–Jul.

Widely cultivated in gardens and parks throughout China, also indoors [only known in cultivation, of hybrid origin from species native to Macaronesia (Canary Islands, Madeira)].

*Pericallis hybrida* is a colorful ornamental plant.

### 1. HAINANECIO


海南菊属 **hái nán jú shū**

Chen Yilin (陈艺林 Chen Yi-ling), Liu Ying (刘莹), Yang Qiner (杨亲二); Bertil Nordenstam

Herbs, perennial. Rhizomes thickened. Leaves rosulate, long petiolate; blade ovate to obovate, pinnately veined. Capitula solitary, terminal. Involucres hemispheric, ecalyculate; phyllaries ca. 13, lanceolate, apex acuminate. Ray florets ca. 13; corolla white. Anthers not caudate, obtuse or sagittate at base; apical appendage ovoid with abaxial cells obviously enlarged; endothecial cell wall thickenings polar and radial. Antheropodia cylindrical. Pollen grains tritorate, helianthoid. Style branches truncate. Achenes obovoid. Pappus absent. \( x = 29^* \).

- One species: China.

The genus has polar and radial endothelial cell wall thickenings, cylindrical antheropodia, and a basic chromosome number of \( x = 29 \), all of which are characteristic of subtribe Tussilagininae. Nevertheless, recent molecular data suggest a position within subtribe Seneconieae and a relationship to the Macaronesian genus *Pericallis*, which shares some unusual characters with _Hainanecio_ such as the non-yellow florets and the helianthoid pollen.


海南菊 **hái nán jú**


Herbs, scapigorous. Rhizomes stout, to 6 mm in diam., rather woody. Stems 1–3, erect, scapiform, 15–30 cm tall, simple, arachnoid-tomentose, with white hairs when young, glabrescent. Leaves several, radical, rosulate, long petiolate; petiole 5–10 cm, stout, sparsely arachnoid-tomentose; blade ovate, ovate-oblong, or obovate, 6–12 × 4–8 cm, both surfaces densely white tomentose when young, ± glabrescent to glabrous or sparsely puberulent, pinnately veined with 6 or 7 lateral veins on each side, midvein prominent abaxially, base rounded to broadly cuneate and sometimes unequal, margin shallowly re- pand-dentate, with mucronulate teeth, apex rounded. Capitula solitary, terminal, ca. 2 cm in diam.; scapes not bracteate. Involucres campanulate-hemispheric, ca. 6 × 7 mm, not calyculate; receptacle subglabrous; phyllaries ca. 9, lanceolate, 1–1.5 mm wide, herbaceous, puberulent, margin scarious, apically puberulent, acuminate. Ray florets 9 or 10; corolla tube ca. 3 mm; lamina yellow, elliptic-oblong, 8–10 × 3–4 mm, 7-veined, apically 2-denticulate, acuminate. Disk florets numerous; corolla yellow, ca. 3.5 mm, with 1.5–2 mm tube and campanulate limb; lobes oblong-lanceolate, ca. 2 mm, apically acute. Anthers oblong, ca. 1.8 mm, basally obtuse to rounded, appendages ovate. Style branches recurved. Achenes obovoid-elliptic, ca. 3.5 mm, smooth, glabrous. Pappus absent. Fl. Jul–Oct, fr. Aug–Nov. \( 2n = 58^* \).

- Shaded places in woods; 900–1200 m. Hainan (Baoting, Changjiang, Qiongzhou).
Herbs, perennial. Rhizome stout and branched, usually growing in a large clone. Stems erect, simple, solitary or clustered. Leaves oblanceolate, mostly basal with distinct petioles, cauleine ones sessile, alternate. Capitula solitary, broadly campanulate, disciform with numerous marginal female florets and disk male florets or discoid and plants monoecious or dioecious. involucres in several series, herbaceous, outermost series largest. Receptacle slightly convex or flat, foveolate, epeate. Functionally male florets usually in center, 20–30 in number; corollas tubular-campanulate, deeply 5-lobed, lobes reflexed; style undivided, conic at apex; pappus of one series. Female florets numerous (sometimes totally female florets in a head or in all capitula of one plant); corolla tubular, shallowly 4-toothed; style 2-branched, branches linear, rounded at apex. Achenes oblong or narrowly obovoid. Pappus of 2 series, barbellate bristles, persistent, numerous on female florets, sparse and shorter on male florets.

One species: Himalaya, including China.

The original description of this genus is somewhat inaccurate. Smith, in the protologue, noted that the pappus is in one series; however, only the pappus in male florets is uniseriate, while those in female florets are biseriate and longer, and all pappus bristles are persistent. Smith described the receptacle as paleate, but the receptacle is, in fact, epeate.

_Cavea_ was originally separated from the genus _Saussurea_. It has been associated with the Inuleae in the older literature, but Merxmüller et al. (in Heywood et al., _Biol. Chem. Compos._ 1: 579. 1977) excluded it from that tribe because of its aberrant pollen-wall morphology. Anderberg considered it might be a relative of _Saussurea_ in the Cardueae. Jeffrey (in Kadereit & C. Jeffrey, _Fam. Gen. Vasc._ Pl. 8: 146. 2007) considered it to be a Carduoid genus of uncertain placement, but he also noted that _Cavea_ may prove to belong elsewhere in Asteraceae.


Herbs, perennial. Rhizome woody, stout, usually branched, 10–30 cm, caespitose with rosette of sterile leaves and flowering stems. Stems stout, 5–25 cm tall, many leaved or sparsely leaved, somewhat scapelike, brownish glandular. Leaves in lower parts subleathery, or ± fleshy, spatulate-oblong, 15–60(–120) × 5–10 mm, abaxially densely glandular pubescent or subglabrous, base attenuate, margin remotely denticulate, apex obtuse or obtuse-acuminate; cauleine leaves ovate-lanceolate to oblong-spatulate, 30–60 × 5–12 mm, slightly fleshy, margin sparsely serrate, apex obtuse; upper cauleine leaves like bracts, ovate-lanceolate, no more than 15 mm, subverticillate at top and ± closely embracing capitulum. Capitula solitary, terminal, widely hemispheric, (2–)3–3.5 cm in diam. Involucre 1.5–2 cm; phyllaries in 4 or 5 series, leaflike, linear-oblong or obovate-lanceolate, nearly as long as florets, margin covered with moderately sparse glandular hairs, apex obtuse or acute. Florets 100–200 in number, very slender. Male florets tubular-campanulate, 5-lobed, limb ca. 4.5 mm, lobes ca. 4 mm; stigma undivided; pappus of 1 series, ca. 5 mm; sterile achenes ca. 11 mm, glabrous. Female florets purplish, tubular, densely white hispid, limb ca. 7 mm, lobes ca. 0.2 mm; stigma 2-lobed, lobes exserted in corolla tube; pappus ca. 7.5 mm. Achenes 5–6 mm, densely sericeous. Pappus nitid purple, as long as corolla, persistent, of 2 series of ca. 50 scabrid subequal bristles. Fl. Jul–Aug, fr. Sep–Oct.

Gravely ground near streams and glaciers; 4000–5100 m. SW Sichuan, Xizang [Bhutan, India (Sikkim)].

247. **Centipeda** Loureiro, Fl. Cochinch. 2: 492. 1790.

Shi Zhu (石铸 Shih Chu); Michael G Gilbert

_Myriogyne_ Lessing.

Annual or perennial herbs. Leaves alternate, entire or coarsely toothed. Capitula apparently axillary, solitary or in monochasial cymes, sometimes grouped into racemelike synflorescence, sessile or shortly pedunculate, heterogamous and discoid. Involucre small, hemispheric; phyllaries in 1 or 2 series, subequal, herbaceous, margins scarious. Receptacle flat or convex, naked. Marginal florets female, in several rows, fertile; corolla minute, tubular, obscurely 3-lobed, creamy white, pale yellow, green, or purplish. Disk florets few, bisexual; corolla campanulate, 4-lobed, similar in color, glabrous. Anthers obtuse at base. Style branches of disk florets short, truncate. Achenes scarcely compressed, obtusely 3- or 4-ribbed or -angled; corona absent.

Ten species: all species in Australia and New Zealand, one species extending to South America, one species extending to Papua New Guinea, and one weedy species extending to Asia and the Pacific Islands, including China.


石胡荽  shi hu sui


Orchidaceae. Bidentate corolla. Central florets 6-20, bisexual, carpogenous, tubular; corolla campanulate, regular, 4-dentate; anthers with very short entire appendages at base; ovary oblong, adnate to 2 neighboring membranes or to 1 membrane of receptacle, more rarely not adnate. Receptacle flat with paleae. External florets multiseriate, female, carpogenous, tubular; corolla 0.3-0.6 mm, filiform, irregular, sometimes subregular, mainly tridentate, more rarely bidentate, sometimes 4-dentate; style ca. 0.8 mm, filiform; ovary with upright glandular hairs at apex; many, spreading from root, 8-20 cm. Leaf blade oblong-obovate to spatulate, 3-12(-27) × 1.5-4(-11) mm, glabrescent to moderately cottony, margins with a few, coarse teeth. Capitula leaf-opposed or apparently axillary, solitary, sessile or subsessile, rounded, 1.5-2.5(-5) mm in diam. Phyllaries obovate, ca. 1 mm, margins membranous, erose. Achenes narrowly cuneate, 0.6-1 mm, tipped with persistent style, angles 4 or 5, with short, ascending bristles, continued virtually to truncate apex; faces often each with a line of sessile glands.

Prostrate or ascending, slender, leafy herb, sparsely lanate to subglabrous, usually with a mixture of white cottony and coarser multicellular hairs. Branches many, spreading from root, 8-20 cm. Leaf blade oblong-obovate to spatulate, 3-12(-27) × 1.5-4(-11) mm, glabrescent to moderately cottony, margins with a few, coarse teeth. Capitula leaf-opposed or apparently axillary, solitary, sessile or subsessile, rounded, 1.5-2.5(-5) mm in diam. Phyllaries obovate, ca. 1 mm, margins membranous, erose. Achenes narrowly cuneate, 0.6-1 mm, tipped with persistent style, angles 4 or 5, with short, ascending bristles, continued virtually to truncate apex; faces often each with a line of sessile glands.

Disturbed habitats; below 1500(-2500) m. Anhui, Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [India, Indonesia, Japan, Papua New Guinea, Philippines, Russia, Thailand; Australia, Pacific islands (Fiji, New Zealand, Samoa)].

The Chinese material belongs to Centipeda minima subsp. minima. The second subspecies, C. minima subsp. macrocephala N. G. Wilson, is restricted to Australia.

Centipeda minima is widely used in traditional medicine.


含苞草属  han bao cao shu

Chen Yousheng (陈又生); Arne A. Anderberg

Capitula 3-4.5(-6) mm in diam., heterogamous, globose, sessile, compactly congested in 2s-4s in bifurcations of stem and its branches. Involucre distichous; phyllaries of various forms, lanceolate, ovate, rhomboidal, or obovate, membranous, margin transparent, with fine denticles, apex acute. Receptacle flat with paleae. External florets multiseriate, female, carpogenous, tubular; corolla filiform, irregular, sometimes subregular, tridentate, more rarely bidentate, sometimes 4-dentate; ovary adnate to neighboring palaean of receptacle almost to half of its length, without pappus, stigma bipartite; marginal female florets minutely radiate with tridentate or bidentate corolla. Central florets 6-20, bisexual, carpogenous, tubular; corolla campanulate, regular, 4-dentate; anthers with very short entire appendages at base; ovary oblong, adnate to 2 neighboring membranes or to 1 membrane of receptacle, more rarely not adnate. Achenes finely terete, smooth, with fine orbicular glands and sparse long glandular hairs, forked at ends. Pappus absent.

One species: China, Russia.

Symphylocarpus has been associated with the Inulinae in the older literature, but it is unlikely to be a member of that tribe and is currently of unknown placement (Jeffrey in Kadereit & C. Jeffrey, Fam. Gen. Vasc. Pl. 8: 574. 2007).


含苞草  han bao cao

Herbs, annual, to 8(-20) cm tall, in habit analogous to Centipeda, glabrous; roots thin, fusiform; stems erect, sulcate, shortly forkedly branching above, branches arculate-spreading. Leaves alternate, sessile, falsely opposite in bifurcations of stems or gathered in 4s, lanceolate, 12-15(-45) × 3-4(-6) mm, glabrous, with 1-3(-7) denticles in upper portion, base attenuate; upper and bract leaves narrow, entire or toothed. Capitula sessile, congested in 2s-4s in bifurcations of stem and its branches, 3-4.5(-6) mm in diam., polyanthous, heterogamous, globose. Involucre distichous; phyllaries of various forms, lanceolate, rhomboidal, oval, or obovate, 1.5-2.5 × ca. 0.5 mm, membranous, glabrous, greenish in center, transparent at margin with fine denticles, apex acuminate. Receptacle flat with paleae lanceolate or ovate, adnate to ovaries of female florets almost up to half of their length, free above, slightly spreading, acuminate with fine denticles at apex, almost reaching apex of corolla in length. External florets multiseriate, female, carpogenous, light yellow, tubular; corolla 0.3-0.6 mm, filiform, irregular, sometimes subregular, mainly tridentate, more rarely bidentate, sometimes 4-dentate; style ca. 0.8 mm, filiform; stigma bipartite with short lobes, ca. 0.16 mm, upright, bluntly linear, ca. 0.06 mm wide, glabrous, slightly divergent; ovary terete, 0.5-1 × ca. 0.2 mm, stalked at base, adnate to nearest palaean of receptacle almost up to middle of its length, with fine globose glands and with glandular, sparse, long, horizontally spreading hairs, ovary with upright glandular hairs at apex;
pappus absent; marginal female florets minutely radiate, with tridentate or bidentate corolla. Central florets 6–20, bisexual, carpogenous, tubular; corolla campanulate, ca. 0.5 mm, with 4-dentate limb. Style slightly prominent from corolla tube, flat; stigma bipartite, with short lobes, ± linear, ca. 0.12 × 0.08 mm, flattened blunt, with mammillae. Stamens 4, attached to middle of corolla tube; anthers connate into tube, surrounding style, fine, subglobose, ca. 0.25 × 0.12 mm, subtruncate above, basally with very short entire appendages, not united in pairs; filaments ca. 0.25 mm, flat, glabrous. Ovary oblong, ca. 0.5 × 0.2 mm, adnate to 2 touching paleae or to 1 pala of receptacle, more rarely not adnate, with sparse pubescence of glandular hairs. Achenes 0.5–1 mm, terete, smooth, crowned with remaining corolla, with very fine globose glands and sparse elongated glandular hairs, forked at ends and horizontally spreading, with upright hairs adaxially; marginal achenes slightly recurved, middle erect. Fl. Jul–Aug.

Silty, flooded, and sandy riverbanks or silty shallows of rivers. Heilongjiang, Jilin [Russia].
9. Tribe ANTHEMIDAEA

春黄菊族  chun huang ju zu
Lin Yourun (林有润) Ling Yeou-ruenn, Ling You-ruen), Shi Zhu (石雏 Shih Chu);
Christopher J. Humphries, Michael G. Gilbert

Shrubs, subshrubs, or annual or perennial herbs, aromatic; indumentum of short biseriate glandular hairs (glands) and uniseriate simple, T-shaped or stellate hairs. Leaves alternate, rarely opposite, fasciculate or in basal rosettes, pinnatisect, pinnatifid, lobed, serrulate, særete, or dentate, rarely entire, rarely succulent, base sometimes with stipulelike auricles ("pseudostipules"). Synflorescences mostly terminal, sometimes axillary, cymose or racemose, often paniculate, often flat-topped. Capitula heterogamous, with marginal female florets and central bisexual or male disk florets, or homogamous with only bisexual tubular florets. Phyllaries in 2–7 rows, overlapping, usually with scarious margin and apices. Receptacle paleate or epeate, rarely pilose or hisrate. Marginal female florets radiate, or corollas tubular to filiform, often 2-toothed, or absent, and capitula disciform, fertile or sterile; corolla yellow or white, less often purplish, or red, orange, or pink. Disk florets bisexual or male, tubular or funnel-shaped, usually yellow, rarely white, purplish, or red, usually 4- or 5-lobed. Anthers mostly rounded, rarely shortly tailed at base, apical appendage ovate or triangular to subulate. Pollen with or without spines. Style base slender or bulbous; style branches usually free (rarely fused in functionally male

About 110 genera and ca. 1,750 species: worldwide, mainly concentrated in C Asia, the Mediterranean region, and S Africa; 29 genera (two endemic, four introduced) and 364 species (138 endemic, ten introduced) in China.

This tribe includes well-known vegetables (Glebionis carinata, G. coronaria, and G. segetum) and famous ornamental plants (most notably “Chrysanthemum grandiflorum”; see note under Chrysanthemum). Insecticides are extracted from some species (e.g., Tanacetum (Pyrethrum) cine-rarifolium). Other species are very important medicinally (e.g., Artemisia annua, the source of the important anti-malarial drug artemisinin) while some are significant forage plants in dry regions.


1a. Capitula radiate; ray florets often conspicuous, but sometimes not so.
2a. Receptacle scales present at least near margins of receptacle.
3a. Capitula in ± flat-topped panicles; involucres 2–(7–9) mm in diam.; mostly wild plants, only occasionally cultivated as medicinal plants .......................................................... 167. Achillea
3b. Capitula solitary, long pedunculate; involucres 7–15 mm in diam.; mostly grown as ornamentals and only occasionally found as an escape .......................................................... 168. Anthemis

2b. Receptacle scales absent, but receptacle sometimes hairy.
4a. Achene winged: marginal achenes 2- or 3-winged, disk achenes 1- or 2-winged; ray florets mostly bright yellow; plants often grown as vegetables or ornamentals .................................................. 172. Glebionis
4b. Achene not winged; ray florets mostly white or pink, less often yellow (Brachanthemum, some species of Chrysanthemum).
5a. Pappus or corona absent, but achenes sometimes with an obtuse rim or with ribs apically projected.
6a. Achene with ribs projected at apex.
7a. Marsh plants; ray florets sterile .......................................................... 163. Leucanthemella
7b. Grassland plants, often grown as ornamentals and only occasionally found as an escape; ray florets fertile .......................................................... 173. Leucanthemum
6b. Achene with ribs not projected at apex.
8a. Dwarf shrubs or subshrubs; involucres campanulate, hemispheric, or obconical; ray florets yellow, lamina ovate, to 3 mm .......................................................... 149. Brachanthemum
8b. Herbs, annual or perennial; involucres shallowly cup-shaped; ray florets white, red, or violet, less often yellow (some species of Chrysanthemum), lamina oblong, often more than 5 mm.
9a. Perennial herbs or subshrubs; achenes terete, ribs 5–8, uniformly spaced, rather obscure .......................................................... 150. Chrysanthemum
9b. Annual herbs; achenes dorsiventrally compressed, ribs 3–5, mainly adaxial, slender but distinct ................................................................. 171. Matricaria

5b. Papuslike corona present.

10a. Corona of separate scales or bristles.
   11a. Corona scales obovate, brown tipped ................................................................. 158. Richteria
   11b. Corona scales bristlelike or subulate.
      12a. Corona scales many, bristlelike, with flat and palmate bases ..................... 156. Allardia
      12b. Corona scales 4–6, subulate, unequal, mainly abaxial ................................. 165. Opisthopappus

10b. Corona cupular, shallowly or deeply divided or to base.
   13a. Achene with multicellular hairs between ribs ................................................ 164. Microcephala
   13b. Achene glabrous.
      14a. Achene with 5–10 equal ribs, without resin sacs ....................................... 169. Tanacetum
      14b. Achene with both thick and thin ribs, abaxially and apically with distinct resin sacs ................................................................. 170. Tripleurospermum

1b. Capitula discoid with all florets bisexual, tubular, or capitula disciform with marginal florets inconspicuous, corollas narrowly tubular to filiform or absent.

15a. Capitula heterogamous, disciform: marginal florets female or neuter, corolla tubular or narrowly tubular or absent, disk florets male or bisexual, tubular.

15b. Capitula homogamous: all florets bisexual, tubular.

16a. Marginal female florets in many rows.
   17a. Capitula pedunculate, terminal; achenes without persistent style ................... 145. Cotula
   17b. Capitula sessile, axillary; achenes with persistent style ................................. 146. Soliva

16b. Marginal female florets in 1 row.

18a. Capitula in spikes or racemes, often secund, often grouped into panicles.
   19a. Papuslike corona present .............................................................................. 153. Crossostephiun
   19b. Corona absent.
      20a. Marginal florets female, disk florets bisexual, fertile; achenes all over receptacle; leaf blade very variable but never pectinate-pinnatisect .......... 151. Artemisia
      20b. Marginal florets partly female, disk florets bisexual, fertile and sterile; achenes in a row around base of receptacle; leaf blade pinnatisect with pectinately arranged lateral lobes .................................................... 155. Neopallasia

18b. Capitula in terminal, rounded to flat-topped panicles, clusters, or solitary.
   21a. Corolla exterior stellate hairy or apically densely pilose with erect straight hairs.
   22a. Annual herbs; corolla exterior apically densely pilose with erect straight hairs ...... 148. Ajaniopsis
   22b. Subshrubs; corolla exterior with stellate hairs ............................................... 162. Kaschgaria

21b. Corolla exterior glabrous or with lower part only sparsely pilose.
   23a. Achene 5–10-ribbed, corona present, 0.1–0.4 mm ......................................... 169. Tanacetum
   23b. Achene 2–6-striate, corona absent.
      24a. Florets all fertile; achenes 4 or 5(or 6)-striate/ribbed ................................ 147. Ajania
      24b. Central disk florets sterile; achenes 2-strate .............................................. 154. Filifolium

15b. Capitula homogamous: all florets bisexual, tubular.

25a. Receptacle scales present at least near margins of receptacle; stems 1 to few, thick with wide pith.
   26a. Stem densely dirty white lanate in lower part, glabrescent in upper part; synflorescence corymbose; involucres ca. 5 mm in diam. ......................................................... 159. Tripleurospermum
   26b. Stem densely arachnoid hairy; synflorescence long pedunculate, umbel-like; involucres 6–9 mm in diam. ............................................................ 160. Pseudohandelia

25b. Receptacle scales absent; stems rarely solitary, not conspicuously thickened with wide pith.
   27a. Corona absent.
      28a. Capitula many, in elongated spikes or racemes, often grouped into panicles ....... 152. Seriphidium
      28b. Capitula many or few, in glomerules or flat-topped panicles.
         29a. Subshrubs, 40–80 cm tall, branches divaricate, sometimes ± spine-tipped; capitula solitary .............................................................. 149. Brachanthemum
         29b. Herbs or subshrubs, branches not divaricate nor spine-tipped; capitula in corymb or umbels of 3 or more.
            30a. Annual herbs; corolla bowl-shaped ....................................................... 166. Stipnolepis
            30b. Biennial or perennial herbs or subshrubs; corolla not bowl-shaped.
               31a. Herbs, stem often solitary, robust, 20–100 cm tall, unbranched below synflorescence, dying after flowering; synflorescence long pedunculate, umbel-like .................................................. 160. Pseudohandelia
31b. Herbs perennial or stemless, small subshrubs, or cushion plants, rarely more than 40 cm tall; synflorescence dense or lax ± flat-topped panicles ................................................................. 161. Hippolytia

27b. Corona present, cupular or with distinct scales.
32a. Achene with distinct resin sacs ................................................................. 170. Tripleurospermum
32b. Achene without resin sacs.

33a. Perennial herbs or subshrubs; achene with 5–12 equally arranged ribs.
34a. Capitula usually solitary at apex of stem; florets yellow ...................... 157. Cancrinia
34b. Capitula many or several, in flat-topped panicle, rarely solitary and then florets orange-red ................................................................. 169. Tanacetum

33b. Annual herbs; achene with 3–5 adaxial ribs.
35a. Capitula usually solitary at apex of stem; florets constricted in middle ...... 164. Microcephala
35b. Capitula many or several, in lax corymb or solitary at apex of lateral branches; florets not constricted ......................................................... 171. Matricaria


石芫绥属 shan yuan sui shu

Lancisia Fabricius; Machlis Candolle.

Herbs, annual or perennial; indumentum absent or of basifixed hairs. Leaves alternate or sometimes opposite or rosulate, pinnatisect, lobed, or occasionally entire. Capitula solitary, pedunculate, heterogamous, radiate, rarely homogamous and discoid. Involucres hemispheric; phyllaries in 2 or 3 rows, unequal, scarious margin narrow. Receptacle flat to conical, ependate. Marginal florets in 1 to several rows, female, fertile, generally pedicellate, corolla tube short or absent, lamina generally absent, white if present; disk florets yellow, bisexual, fertile, apex 4- or 5-lobed. Anther bases obtuse; apical appendage lanceolate. Style branches truncate or obtuse at apex or style undivided. Achenes dorsiventrally flattened, often laterally winged, wings aristaestly lengthened at apex of achene. Corona absent.

Fifty-five species: mostly in S Hemisphere, particularly S Africa and the Pacific islands (New Zealand), also in Australia and South America, a few species extending to E Africa and New Guinea; two species in China.

1a. Achenes of marginal female florets obovoid; lateral wings broad and thick; ultimate segments of leaves
shortly triangular or lanceolate ........................................................................ 171. C. hemisphaerica

1b. Achenes of marginal female florets narrowly oblong; lateral wings very narrow; ultimate segments of leaves linear or linear-lanceolate ................................................................. 2. C. anthemoides


芜绥菊 yuan sui ju

Herbs, annual, small. Stems with diffuse branches, ± villose with pale brown hairs. Basal leaves petiolate; leaf blade oblanceolate-oblong, 3–5 × 1–2 cm, both surfaces sparsely villose or subglabrous, 2-pinnatisect; primary lateral segments 5-paired; ultimate segments shortly triangular or lanceolate, apex shortly acute. Middle stem leaves similar, base semiamplexicaul. Capitula solitary at apex of branches, axillary or opposite with leaves, ca. 5 mm in diam. Involucres cup-shaped; phyllaries in 2 rows, oblong, with 1 red midvein, margin scarious, outer ones small, inner ones large. Marginal female florets many, without corolla; disk florets few, corolla yellow, 4-lobed. Achenes obovoid, ca. 1.2 mm, dorsiventrally flattened, lateral wings broad and thick, with sessile glands. Pappus absent. Fl. and fr. Sep–Mar of next year. 2n = 20.

Wet places by rivers, paddies; 1000–1100 m. Fujian, Guangdong, Hubei, Sichuan, Taiwan, Yunnan [Cambodia, India, Indonesia, Laos, Myanmar, Nepal, Pakistan, Thailand, Vietnam; Africa].


山芫绥 shan yuan sui

Artemisia hemisphaerica Roxburgh, Fl. Ind., ed. 1832, 3: 423. 1832; Cotula chinensis Kitamura; Machlis hemisphaerica (Roxburgh) Candolle.

Herbs, annual, small. Stems with diffuse branches, ± villose with brownish hairs. Basal leaves shortly petiolate; leaf blade oblanceolate, 3–5 × 1–2 cm, both surfaces subglabrous, 2-pinnatisect; primary lateral segments 5-paired; ultimate segments linear or linear-lanceolate. Middle stem leaves similar, oblong, base ampexicaul; distal stem leaves small. Capitula solitary at apex of branches, ca. 5 mm in diam. Involucres cup-shaped; phyllaries in 2 rows, oblong, margin scarious, apex obtuse or acute, with brown midvein. Marginal female florets many, without corolla or corolla 2-toothed; disk florets few, corolla yellow, 4-lobed. Achenes narrowly oblong, ca. 1 mm, slightly dorsiventrally flattened, lateral wings narrow, with sessile glands. Pappus absent. Fl. and fr. Jan–May.

Sandy and stony places by rivers, by paddies; ca. 100 m. Hubei, Sichuan, Taiwan [Bhutan, India, Nepal, Pakistan].

The record of Cotula chinensis in Fl. Taiwan (4: 840. 1978) is referable to Soliva anthemifolia.

裸柱菊属 luo zhu ju shu
Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

*Solivae* Cassini, nom. illeg. superfl.

Herbs, annual, small. Leaves alternate, pinnatisect. Capitulum solitary at leaf axils, disciform. Involucres hemispheric; phyl-
laries in 2 rows, equal, margin scarious. Receptacle convex or conical, epaleate. Marginal florets female, without corolla; disk florets sterile, corolla tubular, 3- or 4-lobed. Anther obtuse at base. Style branches fused. Achenes dorsiventrally flattened, laterally winged; wings sometimes projected, teeth apex with persistent and spinescent style, sometimes transversely wrinkled to sulcate. Pappus absent.

Eight species: mostly in Australia, North and South America; two species (both introduced) in China.

1a. Leaves 5–15 cm; capitula often restricted to base of plant; disk florets 3-merous; achenes longer than broad, prominently villous at apex, with thick corky margins ................................................................. 1. *S. anthemifolia*

1b. Leaves 1.5–5 cm; capitula scattered along stem; disk florets 4-merous; achenes broader than long, glabrous, with thin papery wings indented below middle ................................................................. 2. *S. pterosperma*


裸柱菊 luo zhu ju


Stems very short, prostrate, rooting adventitiously. Leaves alternate, in basal rosettes, spatulate in outline, 5–15 × 1–3 cm overall; petiole 2–3 cm; leaf blade 2- or 3-pinnatifid; ultimate lobes linear, sparsely villous or subglabrous. Capitula at base of stem, sessile, 6–12 mm in diam. Involucres hemispheric, 5–8 × 6–10 mm; phyllaries in 2 or 3 rows, oblong or lanceolate, margin scarious, apex acuminate, outer ones 3–3.5 × 1–1.2 mm, inner ones 3–4 × 0.3–0.6 mm. Marginal female florets in several rows, corolla absent, styles persistent; disk florets 8–12, corolla yellow, tubular, ca. 1.2 mm, apex 3-lobed; style apex capitate. Achenes oblanceolate, 2–2.5 × 0.1–1 mm, dorsiventrally flattened, with thick corky lateral wings, apex long vil-
lous, rounded; style persistent, spinescent. Pappus absent. Fl. fr. year-round. 2n = 18.

Naturalized in waste ground and cultivated areas. Fujian, Guang-
dong, Hainan, Jiangxi, Taiwan, Zhejiang [native to South America].


翼子裸柱菊 yi zi luo zhu ju


Stems decumbent, not rooting adventitiously, branches ascending, pilose. Leaves in basal rosettes, alternate, spatulate in outline, 1.5–5 cm overall; petiole widened below synflores-
cences; leaf blade tripinnatifid to tripinnate, both surfaces pilose. Capitula axillary, scattered along stem, sessile, to 5 mm in diam. Involucres hemispheric, ca. 3 × 5 mm; phyllaries in ca. 2 rows, subequal, oblong to lanceolate, 4–4.5 × 1.5–2 mm, herb-
ceous, abaxially pilose. Marginal female florets 13–15, in several rows, corolla absent, styles forked, persistent; disk florets 5 or 6, corolla greenish, tubular, 1.6–1.8 mm, apex 4-lobed; style capitate. Achenes obovate, ca. 2 × 3 mm, dorsiventrally flattened, glabrous, with thin, flat lateral wings indented below middle into a small basal lobe and larger upper one, apex with persistent, spinelike style, often with additional incurved spines on shoulders of upper lobes.

Naturalized in parks and gardens. N Taiwan [native to South America].

*Soliva pterosperma* can be a noxious weed of lawns, readily dis-


亚菊属 ya ju shu
Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

*Phaeostigma* Muldashev.

Herbs, perennial, or small subshrubs. Leaves alternate, pinnately or palmate-pinnately divided, serrate, rarely entire. Synflo-
rescences cyme, flat-topped or rarely capitula solitary. Capitula heterogamous, disciform. Involucres campanulate or cylindric; phyl-
laries in 4 or 5 rows, herbaceous, scarious margin white or brown. Receptacle convex to conical, epaleate. Florets yellow, rarely purple. Marginal florets in 1 row, female, corolla usually narrowly tubular, rarely wider, apex 2- or 3(–5)-denticulate; disk florets bisexual, corolla tubular, 5-lobed. Anthers obtuse at base, apical appendage lanceolate. Style branches linear, apex truncate. Achenes obovate, 4–6-ribbed/striate. Corona absent.
Thirty-four species: temperate Asia; 35 species (23 endemic) in China.

1a. Involucres straw-colored, glossy, 2–4 mm in diam.; phyllaries with colorless scarious margin.
2a. Capitula 5–14, often regularly fascicled-corymbose at apices of branches; involucres cylindric or narrowly campanulate; phyllaries rigidly herbaceous, apex acute.

3a. Leaf blade adaxially green, 2-pinnatisect ................................................................. 23. *A. parviflora*
3b. Leaf blade gray-green, 3-parted or -lobed ................................................................. 24. *A. trifida*

2b. Capitula many, corymbose or compound-corymbose at apices of stem and branches; involucres campanulate; phyllaries herbaceous, apex obtuse or rounded.
4a. Perennial herbs.

5a. Involucres 6–7 mm in diam.; outer phyllaries narrowly elliptic, apices with rounded waxy appendage ................................................................................................................. 33. *A. pallasiana*
5b. Involucres 2.5–4 mm in diam.; outer phyllaries ovate or lanceolate, apices without rounded waxy appendage.

6a. Stem weakly branched at base, often solitary, almost herbaceous; middle and lower stem leaf blades usually bipinnate with 5–7 lobes ................................................................. 34. *A. fastigiata*
6b. Stem strongly branched at base, woody for much of length; middle and lower stem leaf blades usually twice ternately divided ...................................................................................................... 35. *A. gracilis*

4b. Small shrubs or subshrubs.

7a. Young stems glabrous; leaf blade abaxially green or pale green, glabrous or nearly so .......... 32. *A. nematoloba*
7b. Young stems hairy; leaf blade abaxially gray-white, appressed pubescent.

8a. Leaf blade shallowly toothed to subentire, only occasionally lobed.
9a. Leaf blade adaxially green or gray-green, glabrous or very sparsely pubescent; disk florets ca. 2.5 mm ............................................................................................................... 25. *A. potaninii*
9b. Leaf blade adaxially densely gray-white tomentose; disk florets ca. 4 mm ................. 26. *A. amphigeriace*
8b. Leaf blade pinnatisect, pinnatifid, 2-pinnatisect, palmate-pinnately 3–5-divided, or twice ternately divided.

10a. Leaf blade pinnatisect or pinnatifid.

11a. Leaf blade pinnatisect, adaxially gray-white, densely pubescent .......................... 27. *A. truncata*
11b. Leaf blade pinnatisect, adaxially green, glabrous ................................................. 28. *A. hypoleuca*
10b. Leaf blade 2-pinnatisect, palmate-pinnately 3–5-divided, bipinnatisect, or twice ternately divided.

12a. Leaf blade 2-pinnatisect ....................................................................................... 29. *A. achilleoides*
12b. Leaf blade bipinnatisect, palmate-pinnately 3–5-divided, or twice ternately divided.

13a. Leaf blade twice ternately divided ........................................................................ 35. *A. gracilis*
13b. Leaf blade bipinnately 3–5-sect or bipinnate, pinnately 3–5-sect.

14a. Leaves with divided pseudostipules ........................................................................ 30. *A. nitida*
14b. Leaves with entire pseudostipules ........................................................................ 31. *A. fruticulosa*

1b. Involucres not straw-colored, not glossy, 4–10 mm in diam.; phyllaries with dark brown or purple scarious margin.

15a. Leaf blade undivided, 3-lobed, or simply pinnatisect, or pinnatifid.

16a. Leaf blade undivided, margin entire, serrate, or incised-serrate.

17a. Leaf blade linear, margin entire .............................................................................. 1. *A. salicifolia*
17b. Leaf blade narrowly elliptic, lanceolate, or obovate-oblong, or broadly oblanceolate, rarely linear, margin serrate or incised-serrate.
18a. Subshrubs; leaves 5–10 × 0.3–4 cm, without pseudostipules, abaxially densely and thickly tomentose ................................................................................................................ 2. *A. quercifolia*
18b. Perennial herbs; leaves 3.4–5.5 × 1–2 cm, with divided pseudostipules, abaxially densely pubescent ................................................................. 3. *A. latifolia*

16b. Leaf blade 3-lobed or pinnately divided.

19a. Leaf blade 3-lobed ......................................................................................... 6. *A. alabasica*
19b. Leaf blade pinnately divided.

20a. Leaf blade with 1 or 2 pairs of lateral lobes; lobes linear ...................................... 4. *A. varifolia*
20b. Leaf blade with 3 or 4 pairs of lateral lobes; lobes narrowly elliptic, lanceolate, falcate, or obliquely triangular ........................................... 5. *A. ramosa*

15b. Leaf blade more complexly divided: 2-pinnatisect, bipinnatisect, palmate-pinnately 3–7-divided, tripinnatisect, or tripinnate, pinnately divided.

21a. Small subshrubs with thick, woody rootstocks; stems 4–25 cm.
22a. Capitula solitary; involucres 7–10 mm in diam. ......................................................... 10. *A. scharnhorstii*
22b. Capitula in panicles; involucres 4–7(–8) mm in diam.
23a. Phyllary margin dark purple; corolla apex purple-red ............................................................ 8. *A. purpurea*
23b. Phyllary margin deep brown; florets uniformly yellow.
   24a. Leaf blade elliptic or obliquely elliptic in outline, 1–2 cm, both surfaces densely
tomentose; involucre 4–6 mm in diam. ............................................................................. 7. *A. tibetica*
   24b. Leaf blade suborbicular in outline, 0.3–0.5 cm, both surfaces densely pubescent;
involucre 5–7 mm in diam. .............................................................................................. 9. *A. trilobata*
25a. Leaf blade tripinnatisect, subtripinnatisect, or palmate, tripinnately divided.
   26a. Whole plant densely and thickly tomentose; phyllaries inconspicuous ......................... 19. *A. sericea*
   26b. Whole plant pubescent or densely so; phyllaries conspicuous.
      27a. Leaf blade 3–3.5 × 2–3 cm, adaxially green or pale green, glabrous or nearly
so, ultimate segments lanceolate or elliptic ................................................................. 20. *A. tripinnatisecta*
      27b. Leaf blade 1–2 × 1–1.5 cm, adaxially gray-white, densely pubescent,
ultimate segments linear.
      28a. Stems thinly silvery gray tomentose; leaf blade ca. 2 × 1.5 cm ..................... 21. *A. elegansita*
      28b. Stems densely pubescent; leaf blade ca. 1 × 1 cm ............................................. 22. *A. nubigena*
25b. Leaf blade 2-pinnatisect, bipalmatisect, or subpalmately 3–5-divided.
   29a. Leaf blade bipalmatisect or palmately 3–5-divided.
      30a. Leaf blade adaxially green, subglabrous; involucres 4–5 mm in diam. ............... 17. *A. breviloba*
      30b. Leaf blade adaxially densely gray-white or white pubescent; involucres
6–10 mm in diam. ........................................................................................................... 18. *A. kharlensis*
   29b. Leaf blade 2-pinnatisect.
      31a. Phyllary margin ± distinctly 2-colored: dark brown with a narrow but distinct
colorless margin ............................................................................................................. 16. *A. tenuiifolia*
      31b. Phyllary margin uniformly brown or dark brown scarious.
         32a. Primary lateral segments of leaf blade pinnatilobed, pinnatifid, or
pinnatipartite.
            33a. Primary lateral segments of leaf blade 1- or 2-paired, if 2-paired
then ca. 1 cm apart; ultimate lobes narrowly elliptic or falcate ............... 14. *A. remotipinna*
            33b. Primary lateral segments of leaf blade 2–4-paired, ca. 5 mm at
intervals; ultimate lobes elliptic, lanceolate, or obliquely triangular ..... 15. *A. myriantha*
   32b. Primary lateral segments of leaf blade or leaf blade pinnatisect.
      34a. Leaf blade adaxially gray-white, densely villous or pubescent;
involucres 5–6 mm in diam.; corolla of marginal female florets
with truncate apex ........................................................................................................ 11. *A. brachyantha*
      34b. Leaf blade adaxially green, subglabrous; involucres 2.5–5 mm in
diam.; corolla of marginal female florets with toothed apex.
            35a. Ultimate segments of leaf blade linear-lanceolate or narrowly
elliptic; involucres ca. 2.5 mm in diam. ................................................................. 12. *A. przewalskii*
            35b. Ultimate segments of leaf blade linear; involucres 4–5 mm
in diam. .................................................................................................................. 13. *A. adenantha*


柳叶亚菊 liu ye ya ju

*Tanacetum salicifolium* Mattfeld ex Rehder & Kobuski, J. Arnold Arbor. 13: 207. 1932; *Chrysanthemum linearifolium* C. Chang; *C. salicifolium* (Mattfeld ex Rehder & Kobuski) Handel-Mazzetti; *Phaeostigma salicifolium* (Mattfeld ex Rehder & Kobuski) Muldashev.

Subshrubs, 30–60 cm tall. Flowering branches purple-red, sericeous, especially in upper part and on synflorescence branches. Lower and middle stem leaves sessile; leaf blade linear to lanceolate, 5–10 × 0.3–1 cm, abaxially white, densely and thickly sericeous, adaxially green, glabrous, margin entire. Upper stem leaves progressively smaller. Synflorescence a dense terminal flat-topped panicle. Capitula many. Involucres campanulate, 4–6 mm in diam.; phyllaries in 4 rows, scarious margin broad, brown, outer ones ovate, ca. 2 mm, abaxially sparsely sericeous, middle and inner ones ovate or ovate-elliptic to linear-lanceolate, 3–4 mm. Florets yellow; marginal female florets 6, corolla narrowly tubular, ca. 2 mm, apex 3-denticulate; disk florets many, corolla tubular, ca. 3.5 mm. Achenes ca. 1.8 mm. Corona absent. Fl. and fr. Jun–Sep.

- Mountain slopes; 2600–4600 m. Gansu, Qinghai, Shaanxi, Sichuan.


栎叶亚菊 li ye ya ju

Subshrubs, 60–150 cm tall. Old branches gray-black; flowering branches robust, white, powdery-sericeous especially in upper part and on peduncles. Middle leaves of flowering branches shortly petiolate; leaf blade narrowly elliptic, lanceolate, or obovate-oblong, rarely linear, 5–10 × 2–4 cm, rigid, abaxially white or gray-white, densely and thickly sericeous, adaxially green, glabrous, margin coarsely dentate, incised-lobed, or -fid, teeth or lobes 3- or 4-paired, obliquely triangular or lanceolate, sometimes middle and distal leaves of flowering branches linear-lanceolate or broadly linear, to 10 cm, margin entire. Upper leaves progressively smaller. Synflorescence a dense flat-topped panicle, 4–9 cm in diam.; peduncle robust. Capitula many. Involucres campanulate, 5–6 mm in diam.; phyllaries in 4 rows, scarious margin yellow-brown, outer ones ovo-lanceolate, ca. 2 mm, abaxially sparsely sericeous, middle and inner ones narrowly elliptic to lanceolate, 3–4 mm, abaxially glabrous. Florets yellow, with sessile glands; marginal female florets 11, corolla narrowly tubular, apex minutely 4-denticulate; disk florets many, corolla tubular, apex 5-lobed. Achenes ca. 1.5 mm. Pappus absent. Fl. and fr. Aug–Oct.

- Forest understories, thickets; 3200–3900 m. Sichuan, Yunnan.


宽叶亚菊 kuan ye ya ju

Chrysanthemum shihchuanum H. Ohashi & Yonekura.

Herbs, perennial, 20–35 cm tall, rhizomes long or short, procumbent. Flowering and sterile stems many, sometimes densely clustered, erect, slightly corymbose branched on upper part, pubescent, especially on synflorescence branches and peduncles, densely leafy throughout. Lower leaves withered by anthesis. Middle and upper leaves sessile or subsessile, with divided pseudostipules; leaf blade broadly obovate, or elliptic, 3–4.5 × 1–2 cm, abaxially gray-white, densely and thickly appressed pubescent, adaxially green, glabrous, pinnatifid above middle, base cuneate; lobes 2- or 3-paired, lanceolate or obliquely triangular. Synflorescence a compound flat-topped panicle, 3–5 cm in diam. Capitula many. Involucres campanulate, 5–6 mm in diam.; phyllaries in 4 rows, scarious margin yellow-brown, outer ones obovate-lanceolate, 2–2.5 cm, abaxially sparsely pubescent, middle and inner ones ovate-lanceolate to long ovate, middle ones sparsely pubescent abaxially, inner ones glabrous abaxially. Florets yellow; marginal female florets 6, corolla narrowly tubular, ca. 2.5 mm; disk florets many, corolla tubular, ca. 3 mm, apex 5-lobed. Fl. and fr. Oct.

- Mountain slopes; ca. 3100 m. Sichuan.


异叶亚菊 yi ye ya ju

Chrysanthemum variifolium C. C. Chang, Sinensia 5: 161. 1934; Ajania manchurica Poljakov; Dendranthema variifolium (C. C. Chang) Voroschilov; Phaeostigma variifolium (C. C. Chang) Muldashev.

Subshrubs, ca. 30 cm tall, old branches with densely leafy tips. Flowering branches sparsely sericeous or subglabrous. Middle leaves of flowering branches with petiole 1–2 cm; leaf blade ovate, 2–3 × 1.5–2.5 cm, abaxially gray-white, densely sericeous, adaxially green, glabrous, 3–5-pinnatisect; segments linear or narrowly linear. Lower and upper leaves smaller, blades 3-sect. Synflorescence a terminal compound flat-topped panicle. Capitula many. Involucres campanulate, 4–5 mm in diam.; phyllaries in 4 rows, scarious margin yellow-brown, outer ones ovate or long ovate, ca. 2 mm, abaxially sparsely sericeous at base, apex acute, middle and inner ones narrowly obovate or elliptic, 3–4 mm, apex rounded. Florets yellow, exterior with sessile glands; marginal female florets 6, corolla narrowly tubular, ca. 2.5 mm, apex 2- or 3-denticulate; disk florets many, corolla tubular, ca. 3 mm. Achenes ca. 2 mm. Fl. and fr. Aug–Sep.

Rocky slopes; 1200–3500 m. Heilongjiang, Heilongjiang, Shaanxi [Korea, Russia].

The whole plant is used medicinally for relieving spasms.


分枝亚菊 fen zhi ya ju


Shrubs, 80–150 cm tall. Old branches brownish; flowering branches of current year sericeous, especially above and on synflorescence branches. Middle leaves of flowering branches petiolate; leaf blade elliptic, obovate, or long ovate, 4–5 × 2–2.5 cm, abaxially white or gray-white, densely and thickly sericeous, adaxially green, glabrous, pinnatifid; lobes 3- or 4-paired, narrowly elliptic, lanceolate, or falcate. Proximal and distal leaves progressively smaller. Capitula compound-corymbose at apices of branches. Involucres campanulate, 5–6 mm in diam.; phyllaries in 4 rows, outer ones triangular-ovate, 1.5–2 mm, abaxially sparsely sericeous, scarious margin yellow-brown, apex rounded; middle and inner ones ovate-oblong or obovate, 4–4.5 mm. Florets many, corolla yellow, exterior with sessile glands; marginal female florets 7, corolla narrowly tubular, ca. 2 mm, apex 4-denticulate; disk florets many, corolla tubular, ca. 3 mm. Achenes ca. 1.3 mm. Fl. and fr. Aug–Sep. 2n = 18*.

- Mountain slopes, river valleys; 2900–4600 m. Hubei, Shaanxi, Sichuan, Xizang.


内蒙亚菊 nei meng ya ju

Chrysanthemum alabasicum (H. C. Fu) H. Ohashi & Yonekura.
Subshrubs, 15–30 cm tall. Old branches brown or gray-brown, with many short sterile branches and long flowering branches. Sterile and flowering branches densely sericeous, glabrescent. Lower and middle stem leaves with petiole 2–4 mm; leaf blade spatulate or flabelliform, 0.5–1.5 × 0.2–1.5 cm, both surfaces gray-white, densely sericeous, tripartite or trisect, sometimes bipalmate pinnatisect; primary lateral lobes 1-paired; all lobes linear, oblong-linear, lanceolate, or long ovate, margin entire, apex acute or obtuse. Upper stem leaves 3-pair or entire. Capitulum solitary at branch tips. Involucres campanulate, 5–7 mm in diam.; phyllaries in 4 or 5 rows, margin broadly brown scarious, outer ones rhomboid-ovate, ca. 2 mm, abaxially densely or sparsely sericeous, middle and inner ones broadly elliptic, 4–5 mm, middle ones densely or sparsely sericeous. Florets yellow, exterior with sessile glands; marginal female florets 5, corolla narrowly tubular, ca. 2.5 mm, apex 4-denticulate; disk florets many, corolla tubular, ca. 3 mm. Achenes ca. 1 mm. Fl. and fr. Jun–Aug.

- Rocky slopes. S Nei Mongol (Otog Qi).


西藏亚菊 xi zang ya ju

*Tanacetum tibeticum* J. D. Hooker & Thomson ex C. B. Clarke, Compos. Ind. 154. 1876; *Chrysanthemum tibeticum* (J. D. Hooker & Thomson ex C. B. Clarke) S. Y. Hu.

Subshrubs, 4–20 cm tall. Old branches dark brown; young branches densely sericeous. Leaves petiolate; leaf blade elliptic or oblanceolate, 1–2 × 0.7–1.5 cm, both surfaces gray-white, densely tomentose, 2-pinnatisect; primary lateral segments 2-paired; ultimate segments narrowly elliptic; leaves below synflorescence pinnatisect; ultimate segments narrowly elliptic, margin dark purple, outer ones narrowly ovate or elliptic-ovate, ca. 3.5 mm, middle and inner ones narrowly elliptic to lanceolate, ca. 5 mm. Florets purple above middle; marginal female florets 6, corolla narrowly subulate, ca. 2 mm, apex 3- or 4-denticulate; disk florets many, corolla tubular. Achenes ca. 2.5 mm. Pappus absent.

- Alpine meadows, thickets, gravel mounds; 4800–5300 m. Xizang.


矮亚菊 ai ya ju

*Chrysanthemum trilobatum* (Poljakov) H. Ohashi & Yonekura.

Subshrubs, 5–15 cm tall; roots woody, ca. 1.5 cm in diam. Flowering and sterile branches gray-white, densely pubescent. Petiole ca. 1 cm; leaf blade suborbicular or flabelliform, 3–5 × 4–5 mm, both surfaces gray-white, densely pubescent, 2-palmatisect; primary lateral segments 3–6; ultimate segments ovate or elliptic, apex obtuse or rounded. Synflorescence a terminal flat-topped cyme. Capitula (1–)3–8(–10). Involucres campanulate, (4.5–)5–7(–8) mm in diam.; phyllaries in 3 rows, scarious margin brown, outer ones ovate, ca. 2 mm, abaxially sparsely pubescent, inner ones broadly elliptic to lanceolate, 2–4 mm, abaxially glabrous. Florets yellow; marginal female florets 5, corolla narrowly tubular, ca. 2 mm, apex 3-denticulate; disk florets many, corolla tubular, 2.2–3 mm. Achenes ca. 2 mm. Pappus absent. Fl. and fr. Jul–Aug.

- Fissures of rocks by rivers; ca. 3200 m. Xinjiang (C Tian Shan).


单头亚菊 dan tou ya ju


Subshrubs, 4–10 cm tall, with thick woody rootstock ca. 2 cm in diam. Flowering and sterile branches gray-white, densely and thickly pubescent. Petiole 1–2 mm; leaf blade suborbicular or flabelliform, 3–5 × 5–6 mm, both surfaces gray-white, densely pubescent, bipalmatisect; primary lateral segments 3–7; ultimate segments ovate or elliptic, apex obtuse or rounded. Synflorescence a solitary terminal capitulum. Involucres campanulate, 7–10 mm in diam.; phyllaries in 4 rows, scarious margin brown, outer ones ovate, ca. 3 mm, abaxially sparsely pubescent, middle and inner ones broadly elliptic to oblanceolate, 3–5 mm, middle ones sparsely pubescent abaxially, inner ones glabrous abaxially. Florets yellow; marginal female florets 5, corolla narrowly tubular, ca. 2.5 mm, apex 2–4-denticulate; disk florets many, corolla tubular. Achenes ca. 2.2 mm. Fl. and fr. Aug–Sep. 2n = 18.

Mountain slopes; 3900–4700 m. Sichuan, Xizang [India, Kazakhstan, Pakistan].


紫花亚菊 zi hua ya ju

*Chrysanthemum purpureiflorum* H. Ohashi & Yonekura.

Subshrubs, 4–25 cm tall, with thick woody rootstock. Old branches pale brown; young branches densely tomentose. Leaves petiolate; leaf blade elliptic or obliquely elliptic, 1–2 × 0.8–1.5 cm, both surfaces gray-white, densely and thickly tomentose, palmately 3–5-fid or lobed, or palmate-pinnately 3–5-fid or -lobed; lobes elliptic or narrowly elliptic. Synflorescence a terminal flat-topped cyme, 1.5–2 cm in diam. Capitula 5–10. Involucres campanulate, ca. 5 mm in diam.; phyllaries in 4 rows, abaxially tomentose, especially outer and middle ones, scarious margin dark purple, outer ones narrowly ovate or elliptic-ovate, ca. 3.5 mm, middle and inner ones narrowly elliptic to lanceolate, ca. 5 mm. Florets purple above middle; marginal female florets 6, corolla narrowly subulate, ca. 2 mm, apex 3- or 4-denticulate; disk florets many, corolla tubular. Achenes ca. 2.5 mm. Pappus absent.

- Alpine meadows, thickets, gravel mounds; 4800–5300 m. Xizang.

短冠亚菊 duan guan ya ju

_Chrysanthemum brachyanthum_ (C. Shih) H. Ohashi & Yonekura.

Herbs, perennial, 30–40 cm tall, with slender fibrous roots. Stems much branched above middle. Lower branches long, spreading; upper branches ascending and branches gray-white, pubescent, especially in upper part. Basal and lower leaves pinkish at anthesis. Middle stem leaves sessile; leaf blade broadly obovate-elliptic or elliptic, 1.5–2 × ca. 1 cm, both surfaces gray-white, densely appressed pubescent or villous, 2-pinnaisect; primary lateral segments 2- or 3-paired; ultimate segments narrowly elliptic, ob lanceolate, or falcate, apex acute. Upper leaves and leaves below synflorescence small, pinnatifid or palmatifid. Synflorescence a terminal flat-topped paniculate capitulum. Capitula many. Involucres broadly campanulate, 5–6 mm in diam.; phyllaries in 3 rows, scarios margin broad, brown, outer ones narrowly obovate, ca. 2 mm, abaxially sparsely villous, middle and inner ones elliptic or obovate, ca. 4 mm, middle ones sparsely villous abaxially, inner ones glabrous abaxially. Florets yellow; marginal female florets 6, corolla narrowly tubular, ca. 1.2 mm, apex truncate or obliquely truncate; disk florets many, corolla tubular. Fl. Aug.

- Mountain slopes; 3500–3600 m. Xizang (Nyêmo).


细裂亚菊 xi lie ya ju

_Chrysanthemum przewalskii_ (Poljakov) H. Ohashi & Yonekura.

Herbs, perennial, 35–80 cm tall; rhizomes short, procumbent, with slender fibrous roots; cataphylls brown, ovate. Stems erect, slightly branched at apex, red-purple, pubescent, especially in upper part. Petiole ca. 1 cm; leaf blade broadly obovate or ovate, 2–5 × 1.5–4 cm, abaxially gray-white, densely pubescent, adaxially green or sparsely pubescent, 2-pinnatisect; primary lateral segments 2–4-paired, dense, 3–5 mm apart; ultimate segments linear-lanceolate or narrowly elliptic. Leaves below synflorecence small. Synflorescence a large, terminal, compound flat-topped paniculate capitulum. Capitula many. Involucres campanulate, 2.5–3 mm in diam.; phyllaries in 4 rows, scarios margin brown, outer ones ovate or lanceolate, ca. 1.5 mm, abaxially puberulent, middle and inner ones elliptic to ob lanceolate or lanceolate, ca. 2.5 mm, abaxially glabrous. Florets yellow, exterior with sessile glands; marginal female florets 4–7, corolla narrowly tubular, apex 3-denticulate; disk florets many, corolla tubular. Achenes ca. 0.8 mm. Fl. and fr. Jul.–Sep.

2n = 36*.

- Grasslands, forest margins, on rocks; 2800–4500 m. Gansu, Nei Mongol, Ningxia, Qinghai, Sichuan.


丽江亚菊 li jiang ya ju


Herbs, perennial, 20–30 cm tall; rhizomes short, with slender fibrous roots; cataphylls brown, ovate or ovate-lanceolate; indumentum of medifixed hairs. Stems erect, long branched, pubescent, especially in upper part and on peduncles. Middle stem leaves: petiole 3–5 mm; leaf blade ovate, broadly ovate, or broadly cuneate, 1.5–2 × 0.5–2 cm, abaxially gray-white, densely appressed pubescent, adaxially pale green, sparsely pubescent, 2-pinnatisect; primary lateral segments 1- or 2-paired; ultimate segments linear; lower and upper leaves 3–5-pinnatisect. Synflorescence a terminal flat-topped paniculace. Capitula many. Involucres campanulate, 4–5 mm in diam.; phyllaries in 4 or 5 rows, scarios margin brown, apex rounded or obtuse, outer ones ovate-lanceolate or ovate, ca. 1.5 mm, abaxially pubescent, middle and inner ones elliptic or ovate-lanceolate, 3–3.5 mm, middle ones pubescent abaxially. Florets yellow or orange, lower parts with sessile glands; marginal female florets ca. 7, corolla narrowly tubular, apex acutely 3- or 4-denticulate; disk florets many, corolla tubular.

- Mountain slopes, stony alpine meadows; 3000–3700 m. Hebei, NW Yunnan (Lijiang).


疏齿亚菊 shu chi ya ju


Herbs, perennial, 30–70 cm tall, with slender fibrous roots. Stems erect, much branched, densely or sparsely pubescent. Middle stem leaves: petiole 1–2 cm; leaf blade elliptic, ovate, or obovate, 3.5–5 × 2–3.5(–4) cm, abaxially gray-white, densely and thickly appressed villous, adaxially green, sparsely appressed pubescent, 2-pinnatisect; primary lateral segments 1- or 2-paired, remote, at ca. 1 cm intervals; ultimate segments narrowly elliptic or falcate. Lower and upper stem leaves gradually smaller. Synflorescence a terminal, rather large, compound flat-topped panicle, 3–5 cm in diam. Involucres campanulate, 2.5–3.5 mm in diam.; phyllaries in 4 rows, scarios margin yellow-brown or deep brown, apex obtuse or rounded, outer ones triangular-lanceolate, ca. 3 mm, abaxially sparsely pubescent, middle and inner ones elliptic, ca. 4 mm, abaxially glabrous. Florets yellow, exterior with sessile glands; marginal female florets 8, corolla narrowly tubular, ca. 1.8 mm, apex 2- or 3-denticulate; disk florets many, corolla tubular, ca. 2.5 mm. Achenes ca. 1 mm. Fl. and fr. Aug.–Oct.

- Mountain slopes; 200–3800 m. Gansu, Shaanxi, Shanxi, Sichuan, Xizang.


多花亚菊 duo hua ya ju

Herbs, perennial, 25–100 cm tall, with slender fibrous roots. Stems erect; upper parts pubescent. Middle stem leaves: petiole 0.3–1 cm; leaf blade ovate or oblong, 1.5–3 × 1–2.5 cm, abaxially white or gray-white, densely and thickly appressed pubescent, adaxially green, glabrous or sparsely pubescent, 2-pinnatisect; primary lateral segments 2–4-paired, at ca. 5 mm intervals; ultimate segments elliptic, lanceolate, or obliquely triangular. Upper stem leaves gradually smaller; leaves below synflorescence pinnatisect. Synflorescence a terminal flat-topped panicle, 3–5 cm in diam., rarely a compound corymb to 25 cm in diam. Capitula many. Involucres campanulate, 2.5–3 mm in diam.; phyllaries in 4 rows, scarious margin brown, apex rounded or obtuse, outer ones ovate, ca. 1 mm, abaxially glabrous or sparsely pubescent, middle and inner ones elliptic or lanceolate, 2–2.5 mm, middle ones abaxially glabrous or sparsely pubescent. Florets yellow, exterior with sessile glands; marginal female florets 3–6, corolla narrowly tubular, ca. 1.5 mm, apex (2–)4- or 5-denticulate; disk florets many, corolla tubular, ca. 2 mm. Achenes ca. 1 mm. Fl. and fr. Jul–Oct.

Mountain slopes, river valleys; 2200–3600 m. Gansu, Hubei, Qinghai, Sichuan, Xizang, Yunnan. [Bhutan]


Herbs, perennial, 9–25 cm tall; rhizomes slender, with slender fibrous roots. Stems many, procumbent and erect; procumbent stems with many brown ovate cataphylls; erect stems branched from base, upper parts and peduncles appressed pubescent, hairs medifixed. Middle stem leaves: petiole 0.4–0.8 cm; leaf blade suborbicular, triangular-ovate, or flabelligerum, 1–2 × 1–2 cm, abaxially white or gray-white, densely appressed villous, adaxially pale green, sparsely villous, 2-pinnatisect; primary lateral segments 2- or 3-paired; ultimate segments narrowly elliptic or ob lanceolate. Proximal and distal stem leaves gradually smaller. Synflorescence a terminal flat-topped cyme, 2–3 cm in diam. Capitula few. Involucres campanulate, ca. 4 mm in diam.; phyllaries in 4 rows, apex obtuse, scarious margin distinctly divided into dark brown inner zones and narrow colorless outer zone, outer ones lanceolate, ca. 2.5 mm, abaxially sparsely pubescent, middle and inner ones elliptic to ob lanceolate, 3–4 mm, abaxially glabrous. Florets dark or orange yellow, exterior with sessile glands; marginal female florets 7–13, corolla narrowly tubular, ca. 2 mm, apex 2- or 3-denticulate; disk florets 30–60, corolla 3–4 mm. Achenes ca. 1 mm. Fl. and fr. Aug–Oct. 2n = 36*.

- Grasslands on mountain slopes; 2200–4600 m. Gansu, Jiangsu, Qinghai, Sichuan, Xizang, Yunnan.

Ajania roborowskii var. tsinghaica is known to us only from the protologue. It appears to be a depauperate form with less divided leaves.


Herbs, perennial, 8–50 cm tall; rhizomes slender, with slender fibrous roots; cataphylls brown, triangular-ovate. Stems erect, usually not branched, sometimes branched from base, purple-red, pubescent, especially upper part and below syn florescence. Middle stem leaves: petiole 0.5–1 cm; leaf blade ovate, suborbicular, or flabelligerum, 1.5–3 × 1.5–2 cm, abaxially gray-white, densely and thickly appressed pubescent, adaxially green or pale green, sparsely pubescent or subglabrous, 2-pinnatisect or irregularly 3–5-bipalmate-pinnatisect; primary lateral segments 3- or 4-paired; ultimate segments elliptic or lanceolate-elliptic; proximal and distal stem leaves trisect, 5-palmatisect or bitematisect. Synflorescence a flat-topped panicle, or compound panicle, 2–7 cm in diam. Capitula many or few. Involucres campanulate, 4–5 mm in diam.; phyllaries in 4 rows, abaxially sparsely pubescent, scarious margin brown, outer ones lanceolate-elliptic, ca. 4 mm, middle and inner ones elliptic to long obovate, 3–5 mm. Florets yellow, exterior with sessile glands; marginal female florets 4, corolla narrowly tubular, ca. 2.8 mm, apex minutely 3-denticulate; disk florets many, corolla narrowly tubular, ca. 3 mm. Achenes ca. 2 mm. Fl. and fr. Sep–Oct.

- Open places in forests, gravelly places on mountain slopes; 2800–4100 m. Hubei, Jilin, Shaanxi, Yunnan.

The usual basionym given for this species, Tanacetum pallasi anus (Fischer ex Besser) Trautvetter & C. A. Meyer “var. brevilobum Franchet” (Diels, Notes Roy. Bot. Gard. Edinburgh 7: 26. 1912), is a nomen nudum and was therefore not validly published (Vienna Code, Art. 32.1(d)).


Herbs, perennial, 10–20 cm tall, with slender fibrous roots. Flowering and sterile stems many, diffuse, densely or sparsely...
villous or pubescent. Middle stem leaves: petiole ca. 5 mm; leaf blade orbicular, suborbicular, flabelliform, or broadly cuneate, 0.8–1.5 × 1–1.8 cm, both surfaces gray-white, densely or thinly appressed pubescent, bipalmatisect or 3–5-palmatisect; primary lateral segments 1(or 2)-paired; ultimate segments elliptic. Lower and uppermost stem leaves triscid. Synflorescence a terminal flat-topped cyme, 2–4 cm in diam. Capitula few, (1–)3–5 or many (to 15). Involucres campanulate, 6–10 mm in diam.; phyllaries in 4 rows, abaxially densely or sparsely pubescent, scarious margin brown or gray-brown, apex obtuse or slightly rounded, outer ones lanceolate or linear-lanceolate, 3–4 mm, middle and inner ones broadly lanceolate, narrowly elliptic, or ob lanceolate, 4–5 mm. Florets yellow; marginal female florets 6–8, corolla narrowly tubular, ca. 3 mm, middle and inner ones narrowly elliptic or ob lanceolate, 3–4 mm, abaxially glabrous. Florets yellow, exterior with sessile glands; marginal female florets 7, corolla narrowly tubular, ca. 2 mm, acutely 3-denticulate; disk florets many, corolla tubular, ca. 3 mm. Achenes ca. 1 mm. Fl. and fr. Jul.–Sep.

- Mountain slopes; 2500–5300 m. Gansu, Nei Mongol, Ningxia, Qinghai, Sichuan, Xizang, Yunnan [N India].


密绒亚菊 mi rong ya ju

*Chrysanthemum delavayanum* Ohashi & Yonekura.

Herbs, perennial, ca. 35 cm tall, with 1 flowering stem and 1 or 2 sterile stems; rhizomes short, with slender fibrous roots. Flowering stem erect, most parts densely and thickly sericeous-tomentose. Middle stem leaves: petiole 2–4 mm; leaf blade suborbicular or flabelliform, ca. 0.8 × 1.5 cm, both surfaces gray-white, densely and thickly tomentose, 3-palmatisect or subtripalmate-pinnatisect; primary lateral segments 2-paired; ultimate segments lanceolate or narrowly elliptic. Lower and upper stem leaves smaller. Synflorescence a terminal flat-topped panicle, 2–4 cm in diam. Capitula few or moderate in number. Involucres campanulate, 3–4 mm in diam.; phyllaries in 4 rows, scarious margin pale brown, outer ones linear or lanceolate, ca. 2.5 mm, abaxially densely and thickly tomentose, middle and inner ones ob lanceolate or narrowly elliptic, ca. 3 mm, middle ones densely and thickly tomentose abaxially, inner ones glabrous abaxially. Florets yellow; marginal female florets: corolla orbicular or flabelliform, ca. 0.8 × 1.5 cm, both surfaces gray-white, densely or thickly tomentose, 3-pinnatisect or subtripinnatisect; primary lateral segments 2-paired; ultimate segments lanceolate or elliptic. Upper stem leaves progressively smaller. Synflorescence a terminal compound flat-topped panicle. Capitula many. Involucres campanulate, 3–4 mm in diam.; phyllaries in 4 rows, scarious margin yellow-brown, outer ones elliptic, ca. 2.5 mm, abaxially pubescent, middle and inner ones elliptic or ob lanceolate, 3–4 mm, abaxially glabrous. Florets yellow, exterior with sessile glands; marginal female florets 7, corolla narrowly tubular, ca. 2 mm, acutely 3-denticulate; disk florets many, corolla tubular, ca. 3 mm. Achenes ca. 1 mm. Fl. and fr. Jul.–Sep.

- Mountain slopes; 3200–3300 m. Sichuan (Hongyuan).


云南亚菊 yun nan ya ju


Herbs, perennial, 25–50 cm tall, with small woody rootstock. Stems many, slender, unbranched, erect or ascending, thinly silvery gray tomentose. Stem leaves ca. 2 × 1.5 cm, both surfaces gray tomentose, 3-pinnatisect; ultimate segments linear, 2–3 × 0.5–0.6 mm. Distal leaves less dissected, those subtending synflorescence linear, ca. 1 cm. Synflorescence a terminal flat-topped panicle; peduncles to 1.4 cm, grayish white. Immature capitula 3–4 mm in diam. Outer phyllaries linear or lanceolate, 2–3 mm, grayish white tomentulose; middle and inner ones lanceolate or elliptic, abaxially ± tomentulose, adaxially straw-colored scarious.

- Yunnan.

*Ajania elegantula* seems to be known only from the original immature collections and was regarded as insufficiently known in the FRPS account of *Ajania*. However, the elegant, finely dissected leaves are very distinctive, and it seems justifiable to accept it as a good species.


黄花亚菊 huang hua ya ju

*Tanacetum nubigenum* Wallich ex Candolle, Prodr. 6: 130. 1838; *Chrysanthemum nubigenum* (Wallich ex Candolle) Han-del-Mazzetti; *Dendranthema nubigenum* (Wallich ex Candolle) Kitamura.

Herbs, perennial, ca. 30 cm tall, with slender fibrous roots. Stems unbranched or branched from base or lower part, densely pubescent. Middle stem leaves: petiole 3–5 cm; leaf blade orbicular or broadly ovate, ca. 1 × 1 cm, both surfaces gray-white, densely pubescent, tripinnatisect or inconspicuously tripinnatisect; primary lateral segments 2-paired; ultimate segments linear. Distal stem leaves progressively smaller. Synflorescence a terminal compound flat-topped panicle, ca. 3 cm in diam.; synflorescence branches and peduncles white, densely pubescent. Capitula many. Involucres campanulate, ca. 5 mm in diam.; synflorescence branches and peduncles white, densely pubescent. Capitula many. Involucres campanulate, 3–4 mm in diam.; phyllaries in 4 rows, scarious margin yellow-brown, outer ones elliptic, ca. 2.5 mm, abaxially pubescent, middle and inner ones elliptic or ob lanceolate, 3–4 mm, abaxially glabrous. Florets yellow, exterior with sessile glands; marginal female florets 7, corolla narrowly tubular, ca. 2 mm, acutely 3-denticulate; disk florets many, corolla tubular, ca. 3 mm. Achenes ca. 1 mm. Fl. and fr. Oct.

- Mountain slopes; 3200–3300 m. Sichuan (Hongyuan).
sessile glands; marginal female florets 8, corolla narrowly tubular, ca. 2 mm; apex obtusely 3-denticate; disk florets: corolla tubular, ca. 3 mm. Fl. Aug.

Mountain slopes; 3900–4100 m. Gansu, Sichuan, Xizang (Gyirong), Yunnan [Bhutan, India, Nepal].

"Artemisia nubigena" (Wallich, Numer. List, no. 3233. 1831) belongs here but is a nomen nudum and was therefore not validly published (Vienna Code, Art. 32.1(d)).


小花亚菊 xiao hua ya ju


Subshrubs, 7–25 cm tall. Old branches short, with flowering and sterile stems. Flowering stems either unbranched or shortly fascicular inflorescence-branched at apices of branches, sparsely puberulent. Middle leaves petiolate; leaf blade ovate, ca. 2.5 × 2 cm, abaxially pale gray-white, densely pubescent, adaxially green, sparsely pubescent, 2-pinnatisect; primary lateral segments 1- or 2-paired; ultimate segments linear; proximal and distal leaves 3–5-pinnatisect. Synflorescence a terminal clustered flat-topped cyme. Capitula 5–10. Involucres cylindric, narrowly elliptic, small. Synflorescence a terminal compound flat-topped panicle, 2–8 cm in diam. Capitula many. Involucres campanulate, 2.5–3 mm in diam.; phyllaries in 4 rows, straw-colored, glossy, scarios margin hyaline, outer ones ovate or triangular-lanceolate, ca. 1.5 mm, abaxially sparsely pubescent, apex obtuse or rounded, middle and inner ones elliptic or lanceolate, 2.5–2.5 mm, middle ones abaxially sparsely pubescent, inner ones abaxially glabrous. Marginal female florets 6, corolla narrowly tubular, ca. 2 mm, apex 2-4-denticate; disk florets: corolla tubular, ca. 2.5 mm. Achenes ca. 1.2 mm. Fl. and fr. Aug–Nov.

- Mountain slopes, forests, river valleys, hills; 2000–2300 m. Gansu, Shaanxi, Sichuan.


女蒿 nu hao


Subshrubs, small, to 20 cm tall. Flowering stems slender, long, gray-white, appressed pubescent. Basal leaves in rosette, leaves petiolate; leaf blade spatulate or cuneate, including cuneate-attenuate petiole, 0.5–3.5 × 0.5–0.8 cm, both surfaces gray-green, appressed white pubescent, 3-parted or -lobed; lobes short, linear or oblong-linear, apex obtuse or rounded. Middle and upper leaves usually simple. Synflorescence a terminal clustered flat-topped panicle; peduncle 0.2–1.5 cm, appressed pubescent. Capitula 3–14. Involucres narrowly campanulate, 3–4 mm in diam.; phyllaries in 5 rows, glossy, yellowish, rigidly herbaceous, scarios margin narrow, white, outer ones ovate or elliptic, 2–2.5 mm, middle and inner ones oblong to ob lanceolate, 4–4.5 mm. Corolla yellow, 3–4 mm. Achenes subterete, 1.5–3 mm. Fl. and fr. Jun–Aug.

Stony desert steppes, stony mountain slopes; 900–1400 m. Nei Mongol [Mongolia].

Tzvelev (Fl. URSS 26: 412. 1961) placed this species within Ajania rather than Hippolytia on the basis of the heterogamous capitula and densely leafy woody stems without condensed vegetative shoots.


川甘亚菊 chuan gan ya ju

Tanacetum potaninii Krascheninnikov, Repert. Spec. Nov. Regni Veg. 26: 28. 1929; Ajania dentata X. D. Cui; Chrysanthemum potaninii (Krascheninnikov) Handel-Mazzetti; T. potaninii var. nanum Krascheninnikov; T. potaninii var. suffraticosum Krascheninnikov; T. rockii Mattfeld ex Rehder & Kobuski.

Subshrubs, ca. 70 cm tall. Old branches dark gray; flowering branches sparsely appressed pubescent. Lower and middle stem leaves: petiole ca. 0.5 cm; leaf blade broadly ovate, ovate, orbicular, or broadly elliptic, 1.5–2.5 × 1–2 cm, abaxially white or gray-white, densely and thickly appressed pubescent, adaxially green or gray-green, glabrous or very sparsely pubescent, margin serrate or occasionally inconspicuously 3–5-lobed, apex truncate or acute. Uppermost stem leaves spathulate, orbicular, or narrowly elliptic, small. Synflorescence a terminal compound flat-topped panicle, 2–8 cm in diam. Capitula many. Involucres campanulate, 2.5–3 mm in diam.; phyllaries in 4 rows, straw-colored, glossy, scarios margin hyaline, outer ones ovate or triangular-lanceolate, ca. 1.5 mm, abaxially sparsely pubescent, apex obtuse or rounded, middle and inner ones elliptic or lanceolate, 2.5–2.5 mm, middle ones abaxially sparsely pubescent, inner ones abaxially glabrous. Marginal female florets 6, corolla narrowly tubular, ca. 2 mm, apex 2–4-denticate; disk florets: corolla tubular, ca. 2.5 mm. Achenes ca. 1.2 mm. Fl. and fr. Aug–Nov.

- Mountain slopes, forests, river valleys, hills; 2000–2300 m. Gansu, Shaanxi, Sichuan.


灰叶亚菊 hui ye ya ju


Subshrubs, 18–35 cm tall. Old branches gray-brown; flowering branches sparsely appressed pubescent. Middle stem leaves: petiole ca. 3 mm; leaf blade orbicular or broadly elliptic, 0.7–2 × 0.5–1.5 cm, both surfaces gray-white, densely tomentose, margin undivided, serrate. Uppermost leaves orbicular or narrowly elliptic, small. Synflorescence a terminal flat-topped panicle, 1–4 cm in diam. Capitula many. Involucres campanulate, ca. 3 mm in diam.; phyllaries in 4 rows, straw-colored, scarios margin hyaline, apex obtuse or rounded, outer ones ovate or triangular-lanceolate, ca. 2.5 mm, abaxially pubescent, middle and inner ones elliptic or lanceolate, ca. 3 mm, middle ones pubescent abaxially, inner ones glabrous abaxially. Florets yellow; marginal female florets ca. 13, corolla narrowly tubular,
ca. 3 mm, apex 4-denticulate; disk florets many, corolla tubular, ca. 4 mm. Achenes ca. 2 mm. Fl. and fr. Sep–Nov.

- Mountain slopes; 1700–2300 m. Sichuan (Kangding, Tianquan).


Subshrubs, 15–35 cm tall. Old branches gray-brown; flowering branches sparsely appressed tomentose. Middle stem leaves: petiole 0.2–0.6 cm; leaf blade ovate or broadly ovate, ca. 1.2 × 1.2 cm, both surfaces gray-white, adaxially densely tomentose, pinnatisect; lateral segments 1- or 2-paired. Distal leaves and leaves below synflorescence smaller, undivided. Synflorescence a terminal compound flat-topped panicle, 1–2.5 cm in diam. Capitula many. Involucres campanulate, 2.4–3 mm in diam.; phyllaries in 4 rows, straw-colored, abaxially glabrous, scarios margin hyaline, apex obtuse or rounded, outer ones ovate or triangular-lanceolate, ca. 2 mm, middle and inner ones elliptic, ca. 3 mm. Florets yellow; marginal female florets ca. 16, corolla narrowly tubular, ca. 2 mm, apex 4-denticulate; disk florets: corolla tubular, ca. 3 mm. Achenes ca. 1 mm. Fl. and fr. Aug–Sep.

- Streamsides, wastelands, slopes; 1900–2100 m. Sichuan (Jinchuan).


Herbs, perennial, ca. 30 cm tall. Stems erect, upper parts inflorescence-branched, pubescent. Middle stem leaves sessile, with divided pseudostipules; leaf blade ovate or oblanceolate, 1–1.5 × 0.3–0.6 cm, both surfaces gray-white, densely pubescent, bipalmate-pinnately 3–5-sect; primary lateral segments 1- or 2-paired; ultimate segments elliptic or triangular; leaves below synflorescence small, 3-sect or undivided. Synflorescence a terminal compound lax flat-topped panicle. Capitula many. Involucres campanulate, 3–4 mm in diam.; phyllaries in 4 rows, straw-colored, glossy, abaxially glabrous, scarios margin hyaline, outer ones lanceolate, ca. 1 mm, sparsely pubescent, middle and inner ones ovate, elliptic, or ovate-elliptic, 2–2.7 mm, abaxially glabrous. Florets yellow; marginal female florets 6, corolla narrowly tubular, apx. 3–4-denticulate; disk florets many, corolla tubular. Fl. Sep.

- Roadsides; 600–700 m. Gansu, Sichuan.


Herbs, perennial, ca. 30 cm tall. Stems erect, upper parts inflorescence-branched, pubescent. Middle stem leaves sessile, with divided pseudostipules; leaf blade ovate or oblanceolate, 1–1.5 × 0.3–0.6 cm, both surfaces gray-white, densely pubescent, bipalmate-pinnately 3–5-sect; primary lateral segments 1- or 2-paired; ultimate segments elliptic or triangular; leaves below synflorescence small, 3-sect or undivided. Synflorescence a terminal compound lax flat-topped panicle. Capitula many. Involucres campanulate, 3–4 mm in diam.; phyllaries in 4 rows, straw-colored, glossy, abaxially glabrous, scarios margin hyaline, outer ones lanceolate, ca. 1 mm, sparsely pubescent, middle and inner ones ovate, elliptic, or ovate-elliptic, 2–2.7 mm, abaxially glabrous. Florets yellow; marginal female florets 6, corolla narrowly tubular, apx. 3–4-denticulate; disk florets many, corolla tubular. Fl. Sep.

- Dry mountain slopes; ca. 3900 m. Sichuan.


Subshrubs, 8–40 cm tall. Old branches short. Flowering branches appressed pubescent, especially in upper part. Middle stem leaves: petiole 2–3 mm; leaf blade ovate or cuneate, 1–1.5 × 0.5–1 cm, both surfaces white or gray-white, densely appressed pubescent, 2-pinnatisect; primary lateral segments 2-paired; ultimate segments linear or linear-elliptic. Proximal and distal leaves gradually smaller. Synflorescence a terminal flat-topped panicle, ca. 2 cm in diam. Capitula few to many. Involucres campanulate, ca. 3 mm in diam.; phyllaries in 4 rows, glossy, straw-colored, scarios margin hyaline, apex obtuse or rounded, outer ones elliptic-lanceolate, ca. 2 mm, abaxially puberulent, middle and inner ones ovate to lanceolate, ca. 2.5 mm, middle ones puberulent abaxially, inner ones glabrous abaxially. Florets yellow, exterior with sessile glands; marginal female florets 6, corolla narrowly tubular, ca. 2 mm, apex acutely 4-denticulate; disk florets: corolla tubular, ca. 2.2 mm. Achenes ca. 1 mm. Fl. and fr. Aug–Sep.

- Streamsides, wastelands, slopes; 1900–2100 m. Sichuan (Jinchuan).
pale green, densely pubescent, bipalmately 3–5-sect or bipalmate, pinnately 3–5-sect; primary lateral segments 1- or 2-paired; ultimate segments linear-subulate, broadly linear, or narrowly obovate. Lower and upper leaves narrowly obovate, gradually smaller, palmately 3–5-sect. Synflorescence a terminal flat-topped panicle. Capitula few to many. Involucres campanulate, 3–4 mm in diam.; phyllaries in 4 rows, straw-colored, glossy, scarious margin hyaline, rarely brown, apex obtuse or rounded, outer ones ovate or lanceolate, ca. 1 mm, abaxially sparsely pubescent, middle and inner ones elliptic, 2–3 mm, abaxially glabrous. Florets yellow, exterior with sessile glands; marginal female florets 5–8, corolla narrowly tubular, ca. 2 mm, apex 3(–5)-denticulate; disk florets many, corolla tubular, 2–3 mm. Achenes 1.2–1.5 mm. Fl. and fr. Jun–Oct.

Deserts, desert steppes; 500–4000 m. Gansu, Neimongol, Qinghai, Shaanxi, Xinjiang [Kazakhstan, Mongolia, Russia, Turkmenistan].


Subshrubs, ca. 30 cm tall. Old branches short; young branches pale purple or pale green, glabrous. Lower and middle stem leaves sessile; leaf blade broadly ovate or cuneate, 1–2 × 1–4 cm, both surfaces green or pale green, glabrous or very sparsely puberulent, bitemately palmatisect or palmate-pinnatisect; primary lateral segments 1-paired; ultimate segments filiform. Upper leaves small, 3–5-sect. Synflorescence a terminal flat-topped panicle. Capitula few to many. Involucres campanulate, 2.5–3 mm in diam.; phyllaries in 4 rows, straw-colored, glossy, abaxially glabrous, scarious margin hyaline, outer ones ovate, ca. 1 mm, middle and inner ones broadly obovate, 2.5–3.5 mm. Florets yellow; marginal female florets 5, corolla narrowly tubular, ca. 1.5 mm, apex laterally acutely 2-denticulate; disk florets: corolla tubular, ca. 2 mm. Achenes nearly 1 mm. Fl. and fr. Aug–Oct.

Mountain slopes; 1700–2300 m. Gansu, Neimongol, Qinghai.


亚菊 ya ju

Artemisia pallasiana Fischer ex Besser, Tent. Abrot. 61. 1832; Chrysanthemum pallasianum (Fischer ex Besser) Komarov; Pyrethrum pallasianum (Fischer ex Besser) Maximowicz; Tanacetum pallasianum (Fischer ex Besser) Trautvetter & C. A. Meyer.

Herbs, perennial, 30–90 cm tall. Stems erect, solitary and sparsely asperose, bilaetebrately or shortly branched, appressed pubescent, especially on upper parts including peduncles. Basal leaf blade ovate, 0.5–1 cm; leaf blade ovate, narrowly elliptic, or rhomboid, 2–4 × 1–2.5 cm, abaxially white or gray-white, appressed densely and thickly pubescent, adaxially green, glabrous, bipalmate or bipalmate-pinnately 3–5-sect, primary lateral segments 1- or 2-paired; ultimate segments linear or linear-lanceolate. Upper stem leaves smaller and progressively smaller. Synflorescence a terminal compound flat-topped panicle, 3–5 cm in diam. Capitula few to many. Involucres broadly campanulate, 6–7 mm in diam.; phyllaries in 4 rows, straw-colored, glossy, abaxially glabrous, outer ones narrowly elliptic, 2.5–3 mm, apex with rounded waxy hyaline appendage, middle and inner ones long ovate, ca. 4 mm. Florets yellow, exterior with sessile glands; marginal female florets 3, corolla tubular, ca. 3.5 mm, apex 5-denticulate; disk florets many, corolla tubular, ca. 3.5 mm, apex 5-lobed. Achenes ca. 1.8 mm. Fl. and fr. Aug–Sep. 2n = 36.

Thickets, mountain slopes; 200–2900 m. Gansu, Heilongjiang, Jilin, Liaoning, Shaanxi [Korea, Mongolia, Russia].


新疆亚菊 xin jiang ya ju


Herbs, perennial, 30–90 cm tall. Stems erect, solitary or fascicled, branching or shortly branched from middle or above, pubescent. Lower stem leaves withered at anthesis. Middle stem leaves: petiole ca. 1 cm, leaf blade broadly triangular-ovate, 3–4 × 2–3 cm, both surfaces gray-white, densely appressed pubescent, 2-pinnatisect; primary lateral segments 2- or 3-paired; ultimate segments narrowly elliptic or obovate. Upper stem leaves similar, progressively smaller. Synflorescence a terminal flat-topped panicle. Capitula many. Involucres campanulate, 2.5–4 mm in diam.; phyllaries in 4 rows, abaxially glabrous, scarious margin hyaline, apex obtuse, outer ones linear, 2.5–3.5 mm, middle and inner ones elliptic or obovate, 3–4 mm. Florets yellow; marginal female florets 8, corolla narrowly tubular, ca. 1.5 mm, apex 3-denticulate; disk florets many, corolla tubular, 1.8–2.5 mm. Achenes 1–1.5 mm. Fl. and fr. Aug–Oct.

Steppes, semideserts, forest understories; 900–2300 m. Xinjiang [Afghanistan, Kazakhstan].


纤细亚菊 xin xi ya ju

Tanacetum gracile J. D. Hooker & Thomson in J. D. Hooker, Fl. Brit. India 3: 318. 1881; Chrysanthemum gracile (J. D. Hooker & Thomson) B. Fedtschenko (1915), not (Schultz Bipontinus) Masferrery Arquimbau (1881); C. hookeri Kitamura.

Subshrubs, 15–45(–60) cm tall, with thick woody root. Stems strongly branched at base and woody for much of length, densely grayish pubescent, hairs adpressed, bifid. Lower stem leaves withered at anthesis. Middle stem leaves 2–3 cm; petiole rather long, wingless, base sometimes with linear pseudostipules; leaf blade rounded triangular, ca. 2.5 cm wide, both surfaces gray-green, appressed pubescent, twice ternately divi-

画笔菊属 hua bi ju shu

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

Herbs, annual. Leaves alternate, biternately pinnatisect, 2-pinnatisect, or trisect. Synflorescences cymose; capitula many or few, in ± flat-topped panicles, rather small, heterogamous, disciform. Involucre obovoid, 4–5 mm in diam.; phyllaries in 2 rows. Receptacle convex, epihedral. Marginal florets in 1 row, female; corolla pitcher-shaped, tapering above; limb yellow, apex minutely 2-toothed, apically pilose with straight erect hairs. Disk florets many, bisexual; corolla tubular, apex 5-lobed. Anther bases obtuse; apical appendage subtriangular. Style branches truncate at apex. Achenes obovoid, 5- or 6-ribbed. Pappus absent.

● One species: China.


画笔菊 hua bi ju

Plants 5–10 cm tall. Stems few branched from base, branches prostrate in lower part, upper part ascending, white villous. Middle stem leaves: petiole ca. 0.5 mm; leaf blade broadly cuneate or suborbicular, 0.5–0.7 × ca. 1 cm, both surfaces densely villous, biternately pinnatisect or 2-pinnatisect; primary lateral segments 1-paired; ultimate segments linear or broadly linear, apex acute. Proximal and distal leaves small.

Synflorescence a flat-topped terminal panicle. Capitula many or few. Involucre obovoid, 4–5 mm in diam.; phyllaries in 2 rows, abaxially densely villous, scarious margin dark, outer ones elliptic, 3–3.5 mm, inner ones spathulate or oblanceolate, ca. 3 mm. Florets yellow, apically pilose with erect straight hairs; marginal female florets 7 or 8, corolla asidiform, ca. 2 mm, tapering above; disk florets 12, corolla tubular, ca. 2.5 mm. Achenes obovoid, ca. 1.8 mm, 5- or 6-ribbed. Pappus absent. Fl. and fr. Sep.

● Steep slopes; 4600–5000 m. Xizang (Nanmulin).

149. BRACHANTHEMUM Candolle, Prodr. 6: 44. 1838.

短舌菊属 duan she ju shu

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

Subshrubs, ± procumbent, woody at base, pubescent with basifixed, medifixed, or stellate hairs. Leaves alternate or subopposite, few lobed. Synflorescences cymose; capitula solitary or in ± flat-topped cymes or panicles, heterogamous, radiate, rarely homogamous and discoid. Involucre campanulate, hemispheric, or obconical; phyllaries in 4 or 5 rows, rigidly herbaceous, scarious margin white or brown. Receptacle flat or convex to conical, epihedral. Marginal florets female, fertile, rarely absent; lamina yellow, rarely white. Disk florets yellow, bisexual; corolla tubular, apex 5-lobed. Anther bases obtuse; apical appendage lanceolate. Style branches linear, apex truncate. Achenes terete, 5-striate. Corona absent.

Ten species: C Asia, China, Mongolia; six species (one endemic) in China.

1a. Capitula homogamous, ray florets absent; phyllaries abaxially prominently gland-dotted ................................................. 6. B. gobicum
1b. Capitula heterogamous, ray florets present; phyllaries abaxially not or only obscurely gland-dotted.

2a. Plants with appressed stellate hairs ..................................................................................................................... 5. B. pulvinatum
2b. Plants with simple or medifixed hairs.

3a. Most leaves palmately 3(–5)-lobed.
4a. Leaves sessile or subsessile, leaf blade obliquely elliptic or suborbicular, ca. 0.6 × 0.5 cm; achenes ca. 2.8 mm .......... 1. B. mongolicum
4b. Leaves rather long petiolate, leaf blade almost orbicular, to 1.5(–2) × ca. 1.5 cm including petiole; achenes 1.8–2.2 mm ................................................................. 2. B. fruticulosum

3b. Most leaves pinnately 4–7-lobed, uppermost leaves sometimes palmately 3-lobed.
5a. Capitula (1–)3–15(–20), 2–4 crowded at apex, remainder on long divergent peduncles .......... 3. B. titovii
5b. Capitula 1(–5) on long erect peduncles ............................................................................................................. 4. B. kirgisorum

蒙古短舌菊 meng gu duan she ju

Subshrubs, 5–20 cm tall; indumentum of simple or bifurcate hairs. Old branches gray, twisted; young branches appressed pubescent. Leaves sessile or subsessile, leaf blade obliquely elliptic or suborbicular, ca. 0.6 × 0.5 cm, grayish green or green, appressed pubescent, glabrescent, palmate-pinnate, 3–5–divided; segments linear-subulate. Uppermost stem leaves entire. Synflorescence an irregular flat-topped cyme. Capitula 3 or 4. Involucres obconical or campanulate, 4–6 mm in diam.; phyllaries in 4 rows, outer ones ovate, ca. 2.5 mm, scarious margin brownish, middle ones elliptic, ca. 6 mm, inner ones oblanceolate, ca. 5 mm. Ray florets ca. 8; lamina yellow, apex minutely 2-denticulate. Achenes ca. 2.8 mm. Fl. and fr. Aug.

Gobi Desert. Gansu, Xinjiang [Mongolia].

2. *Brachanthemum fruticosum* Candolle, Prodr. 6: 45. 1838.

灌木短舌菊 guan mu duan she ju

Subshrubs, 5–20 cm tall; indumentum of simple or bifurcate hairs. Old branches gray, twisted; young branches appressed pubescent. Leaves sessile or subsessile, leaf blade almost orbicular, to 1.5–(2) × ca. 1.5 cm including petiole, grayish green, finely tomentose, inconspicuously gland-dotted, pinnatisect, segments (1 or)2 or 3(or 4) each side, subulate, apices cuspidate; upper stem leaves palmately 3-lobed, uppermost leaf entire. Capitula solitary, less often up to 5 per stem on long erect peduncles. Involucres cup-shaped, 4.5–6.5 × 5–7 mm; outer phyllaries 1/3–2/5 as long as inner, margin membranous, rather broad, light colored or pale brown. Ray florets 5–12(–15); lamina yellowish white, broadly ovate, 2.2–3 mm. Disk florets 2–3 mm. Achenes 1.8–2.4 mm.

Stony slopes; above 1000 m. Xinjiang (Tian Shan) [Kazakhstan].


无毛短舌菊 wu mao duan she ju

Subshrubs, 10–35 cm tall; indumentum of simple or bifurcate hairs. Stems several from base, woody for most of length, branched mainly above middle; young branches finely appressed, grayish tomentose. Petiole rather long, thickened at base; leaf blade broadly ovate in outline, 2–2.5 × ca. 1.5 cm including petiole, grayish green, finely tomentose, inconspicuously gland-dotted, pinnatisect, segments (1 or)2 or 3(or 4) each side, subulate, apices cuspidate; upper stem leaves palmately 3-lobed, uppermost leaf entire. Synflorescence an irregular flat-topped panicle. Capitula (1–)3–15(–20). Involucres cup-shaped, 4.5–6 × 4–5.5 mm; outer phyllaries 1/3–2/5 as long as inner, margin membranous, rather broad, light colored or pale brown. Ray florets 1–8; lamina yellowish white, broadly ovate, 2.2–3 mm. Disk florets 2–3 mm. Achenes 2–2.5 mm.

Stony slopes, particularly on red conglomerates. Xinjiang (Tian Shan) [Kazakhstan].


吉尔吉斯短舌菊 ji er ji si duan she ju

Subshrubs, 5–25 cm tall; indumentum of simple or bifurcate hairs. Stems many from base, woody for most of length, simple or with 1–5 long lateral branches; young branches finely appressed, grayish tomentose. Petiole rather long, thickened at base; leaf blade broadly ovate in outline, 2–2.5 × ca. 1.5 cm including petiole, grayish green, finely tomentose, inconspicuously gland-dotted, pinnatisect, segments (1 or)2 or 3(or 4) each side, subulate, apices cuspidate; upper stem leaves palmately 3-lobed, uppermost leaf entire. Capitula solitary, less often up to 5 per stem on long erect peduncles. Involucres cup-shaped, 4.5–6.5 × 5–7 mm; outer phyllaries 1/3–2/5 as long as inner, margin membranous, rather broad. Ray florets 5–12(–15); lamina yellowish white, broadly ovate, 2.2–3 mm. Disk florets 2–3 mm. Achenes 1.8–2.4 mm.

Stony slopes; above 1000 m. Xinjiang (Tian Shan) [Kazakhstan].


星毛短舌菊 xing mao duan she ju


Subshrubs, 15–45 cm tall; indumentum of stellate hairs. Old branches gray, twisted; young branches brownish, densely and appressed white powdery-puberulent. Petiole to 8 mm; leaf blade cuneate, elliptic, or suborbicular, 0.5–1 × 0.4–0.6 cm, gray-green, appressed powdery-puberulent, glabrescent, pinnate-pinnately or pinnately 4- or 5-divided; segments linear; leaves below synflorescence 3-lobed. Synflorescence terminal, a solitary capitulum or irregular flat-topped cyme. Capitula apically solitary or 3–8; peduncles 2.5–7 cm. Involucres hemispheric or obconical, 6–8 mm in diam.; phyllaries in 4 rows, outer ones ovate or broadly ovate, ca. 2.5 mm, abaxially densely appressed powdery-puberulent, scarious margin brown, middle ones elliptic, 4–4.5 mm, abaxially densely and appressed powdery-puberulent, inner ones linear-oblanceolate, ca. 4 mm, abaxially glabrescent. Ray florets 5–15; lamina yellow, elliptic, apex minutely 2-denticulate. Achenes ca. 2 mm. Fl. and fr. Jul.–Sep.

- Mountain slopes, Gobi Desert; 1200–3200 m. Gansu, Nei Mongol, Ningxia, Qingshai, Xinjiang.

Filatova (Rast. Tsentr. Azi 14a: 38. 2007) divided this species between two species: *Brachanthemum pulvinatum* with ovate ray floret lamina and smooth phyllary margins and *B. nanschanicum* with narrower, oblong ray floret lamina and lacerate-undulate phyllary margins.


戈壁短舌菊 ge bi duan she ju

Subshrubs, 5–20 cm tall; indumentum of simple or bifurcate hairs. Stems many from base, woody for most of length, simple or with 1–5 long lateral branches; young branches finely appressed, grayish tomentose. Petiole rather long, thickened at base; leaf blade broadly ovate in outline, 2–2.5 × ca. 1.5 cm including petiole, grayish green, finely tomentose, inconspicuously gland-dotted, pinnatisect, segments (1 or)2 or 3(or 4) each side, subulate, apices cuspidate; upper stem leaves palmately 3-lobed, uppermost leaf entire. Capitula solitary, less often up to 5 per stem on long erect peduncles. Involucres cup-shaped, 4.5–6.5 × 5–7 mm; outer phyllaries 1/3–2/5 as long as inner, margin membranous, rather broad. Ray florets 5–12(–15); lamina yellow, elliptic, apex minutely 2-denticulate. Achenes ca. 2 mm. Fl. and fr. Jul.–Sep.

- Mountain slopes, Gobi Desert; 1200–3200 m. Gansu, Nei Mongol, Ningxia, Qingshai, Xinjiang.

Filatova (Rast. Tsentr. Azi 14a: 38. 2007) divided this species between two species: *Brachanthemum pulvinatum* with ovate ray floret lamina and smooth phyllary margins and *B. nanschanicum* with narrower, oblong ray floret lamina and lacerate-undulate phyllary margins.
Subshrubs, (15–)40–80 cm tall; indumentum "glandular pubescent." Stems few from base, much branched, woody for most of length, bark yellowish white, branching slightly divaricate, sometimes ± spine-tipped, glabrescent. Petiole rather long; leaf blade spatulate to cuneate, 1–2 cm including petiole, pinnatifid, segments 1–3 each side, narrowly triangular, puberulent or subglabrous, with sunken glands; condensed lateral phyllaries with short leaves sometimes present; uppermost leaves linear, entire. Capitula solitary or few in ill-defined cyme, on long slender peduncles. Involucre narrowly campanulate, 8–10 × 4–6 mm; phyllaries convex, abaxially ± densely puberulent and prominently gland-dotted, margin white scarios, apex rounded, outer ones obovate, inner ones lanceolate. Ray florets absent.

1630 listed over 500 cultivars) into the huge array of ornamental cultivars available today. The primary parental species is Morifolium (Ramatuelle) Tzvelev, Sinense (Sabine) Des Moulins, and Arctanthemum (Tzvelev) Tzvelev; Dendranthema sect. Dendranthema Candolle.

Shrubs or perennial herbs; indumentum absent or of basifixid or medifixed hairs. Leaves alternate, pinnately or palmately divided, serrate, or rarely entire. Synflorescence a lax irregular terminal cyme, often reduced to solitary capitulum. Capitula heterogamous, radiate, laxly corymbose or solitary. Involucres cup-shaped, rarely campanulate; phyllaries in 4 or 5 rows, scarious margin white, brown, or dark brown, or outer and middle ones herbaceous and pinnatifid. Receptacle convex to conical, epaneate. Ray florets female, fertile, in 1 or many rows (in cultivars); lamina yellow, white, or red. Disk florets many, bisexual, fertile; corolla yellow, tubular, 5-lobed. Anther obtuse at base; apical appendage lanceolate-ovate or narrowly elliptic. Achenes subterete or obovate, yellowish white, branching slightly divaricate. The homogamous capitula suggest that the generic placement of this species deserves closer examination.


Arctanthemum (Tzvelev) Tzvelev; Dendranthema (Candolle) Des Moulins; Dendranthema sect. Dendranthema Candolle.

The florists’ chrysanthemum, 菊属 (ju shu), is an enormous hybrid complex developed over many centuries (a Chinese account published in 1630 listed over 500 cultivars) into the huge array of ornamental cultivars available today. The primary parental species is Chrysanthemum indicum, but the other parentage is now obscure. More recent hardier “Korean chrysanthemums” include C. zawadskii in their parentage. This complex is most widely known as “C. grandiflorum” (Broussonet, Elench. Horti Bot. Monspel. 15. 1805, supposedly based on Anthemis grandiflora Ramatuelle, J. Hist. Nat. 2: 233. 1792), but Broussonet’s name is a nomen nudum with no reference to Ramatuelle’s name; and, even if it were validly published, it would be a later homonym of C. grandiflorum (Desfontaines) Dumont de Courset (Bot. Cult. 2: 467. 1802). The most common alternative name is C. morifolium Ramatuelle (loc. cit.: 240), but this is of uncertain status and identity. Further work is therefore needed to establish the most acceptable scientific name for the complex. As is to be expected for such an important horticultural plant, there is an extensive synonymy, including: A. apiifolia R. Brown, A. artemisiifolia Willdennow, A. stipulacea Moench, C. borchorum L. H. Bailey, C. morifolium var. gracile Hemsley, C. sinense Sabine, C. sinense var. hortense Makino ex Matsumura, C. stipulaceum (Moench) W. Wright, Dendranthema grandiflorum (Ramatuelle) Katamura, D. morifolium (Ramatuelle) Tzvelev, D. sinense (Sabine) Des Moulins, and Matricaria morifolia Ramatuelle.

1a. Outer and sometimes middle phyllaries herbaceous, pinnatifid or pinnatifid.
  2a. Leaves undivided or lyrate-pinnatisect, abaxially grayish white, appressed and thickly villous ............... 20. C. argyrophyllum
  2b. Middle and proximal stem leaves bipinnate- or bipalmate-pinnately divided, abaxially green, glabrous or nearly so .......................................................... 21. C. mongolicum

1b. Phyllaries with white, brown, or dark scarios margins.
  3a. Capitula 0.5–1 cm in diam.; ray floret lamina 1–3 mm.
     4a. Leaves 2-pinnatisect; capitula many, in dense flat-topped synflorescence ............................................ 18. C. glabriusculum
     4b. Leaves pinnatisect; capitula 1–3 ...................................................... 19. C. dichroum
  3b. Capitula 1.5–5 cm in diam., rarely smaller; ray floret lamina (1–)5 mm or more.
     5a. Leaf blade bipalmate, bipalmate-pinnatifid, bipinnatifid, or bitemate-pinnatisect.
        6a. Ray florets white, pink, or purple-red.
           7a. Leaves bipalmate, bipalmate-pinnately divided, or bitemate-pinnatisect; capitula solitary, rarely 2–5 ........................................................................................................ 10. C. oreastrum
           7b. Leaves bipinnatifid; capitula many, in lax cymes, rarely solitary.
              8a. Primary lobes of leaf blade pinnatifid or pinnatifid, ultimate lobes triangular or obliquely triangular, ca. 3 mm wide .............................................................. 16. C. zawadskii
              8b. Primary lobes of leaf blade pinnatisect or subpinnatisect, ultimate lobes linear or narrowly linear-lanceolate, 1–2 mm wide .................................................................. 17. C. maximoviczii

3b. Leaves bipinnatifid; capitula many, in lax cymes, rarely solitary.
   18. C. argyrophyllum
   19. C. dichroum
   20. C. morifolium
   21. C. mongolicum
6b. Ray florets yellow or apricot-colored.

9a. Capitula solitary, terminal; outer phyllaries 5–7 mm.

10a. Leaves bipalmate, bipalmate-pinnately divided, or biternate-pinnatisect; stems unbranched ................................................................. 9. C. hypargyreum

10b. Leaves 1- or 2-pinnatisect; stems laxly branched above middle.

11a. Capitula 1–1.5 cm in diam., subtending bracts elliptic, 5–7 × 3–4 mm, margins coarsely toothed ................................................................. 14. C. foliaceum

11b. Capitula 2.4–3 cm in diam., subtending bracts linear, 20–25 × 2–5 mm, entire ................................................................................... 15. C. longibracteatum

9b. Capitula several to many, ± cymose; outer phyllaries 2.5–4 mm.

12a. Leaves on both surfaces densely or sparsely pubescent ................................................. 11. C. lavandulifolium

12b. Leaves adaxially green, sparsely pubescent or glabrescent, abaxially gray-white, densely and thickly pubescent.

13a. Outer phyllaries linear or linear-oblancoaleate, apex rounded scarious-ampliate, densely pubescent abaxially .............................................. 12. C. potentilloides

13b. Outer phyllaries ovate or long ovate, apex not rounded scarious-ampliate, sparsely hairy only at base or adaxially ........................................ 13. C. arisanense

5b. Leaf blade repand-remotely dentate, 1-toothed on each side, or entire, shallowly pinnatifid, or palmately to pinnately 3–7-divided.

14a. Ray florets yellow ................................................................................................. 3. C. indicum

14b. Ray florets white, pink, or purple.

15a. Ray florets purple; leaf blade ca. 1.5 × 1 cm, shallowly pinnatifid, lateral segments often 2-paired ........................................................................... 22. C. parvifolium

15b. Ray florets white or pink, rarely purple; leaf blade not as above.

16a. Leaf blade repand-remotely dentate, 1-toothed on each side, or entire, densely and thickly pubescent abaxially.

17a. Leaves 3.5–7 × 2–4 cm, margin repand-dentate ........................................................ 1. C. vestitum

17b. Leaves 1–1.4 × 0.7–1.5 cm, entire or 1-toothed on each side .................................. 2. C. rhombifolium

16b. Leaf blade palmately or pinnately 3–7-divided or palmate-pinnately 3–7-divided.

18a. Rhizome thick and fleshy; achenes not slippery when wet ........................................... 6. C. arcticum

18b. Rhizome not fleshy; achenes slippery when wet.

19a. Capitula 3 or more in irregular cymes (mainland).

20a. Leaf blade reniform, suborbicular, or broadly ovate, base somewhat cordate or truncate ........................................................................ 4. C. chanetii

20b. Leaf blade elliptic, narrowly elliptic, or ovate, base cuneate or broadly cuneate ................................................................. 5. C. naktongense

19b. Capitula solitary, on peduncles to 20 cm (Taiwan).

21a. Plants erect; leaf blade pinnately lobed, lobes crenate or dentate; ray floret lamina ca. 6 mm .................................................. 7. C. horaimontanum

21b. Plants ascending; leaf blade palmately 3- or 5-lobed, lobes subentire; ray floret lamina ca. 15 mm .............................................. 8. C. morti


毛华菊 mao hua ju

Herbs, perennial, ca. 60 cm tall, with procumbent rhizomes. Stems erect, long robust-branched in upper part or shortly corymbose branched at apex, or spreading, densely and thickly pubescent or becoming sparsely pubescent. Lower stem leaves withered at anthesis. Middle stem leaves: petiole 0.5–1 cm; leaf blade ovate, broadly ovate, ovate-lanceolate, suborbicular, or spatulate, 3.5–7 × 2–4 cm, grayish green, abaxially densely and thickly appressed pubescent, adaxially sparsely pubescent, grayish white, margin above middle obtusely repand-dentate, rarely obtusely 2- or 3-lobed, cuneate toward base. Distal stem leaves sessile or subsessile, similar, simple.

Synflorescence a lax flat-topped cyme. Capitula 3–13, 2–5 cm in diam. Involucres cup-shaped, 1–1.5 cm in diam.; phyllaries in 4 rows, abaxially densely pubescent, scarious margin brown, outer ones triangular or triangular-ovate, 3.5–4.5 mm, middle ones lanceolate-ovate, ca. 6.5 mm, inner ones obovate or oblancoaleate-elliptic, 6–7 mm. Ray floret lamina white, 1.2–2 cm. Achenes ca. 1.5 mm. Fl. and fr. Aug. 2n = 54*.

- Low mountain slopes, hills, shaded slopes, streamsides; 300–1500 m. Anhui, Henan, Hubei, Shaanxi.

1a. Stems erect; capitula 2–3 cm in diam. ..... 1a. var. vestitum

1b. Stems sprawling; capitula 4.5–5 cm in diam. .................................................. 1b. var. latifolium

1a. Chrysanthemum vestitum var. vestitum

毛华菊(原变种) mao hua ju (yuan bian zhong)
Chrysanthemum sinense Sabine var. vestitum Hemsley, J. Linn. Soc., Bot. 23: 439. 1888; Dendranthema vestitum (Hemsley) Y. Ling.

Stems erect, robust. Middle stem leaf blades ovate, broadly ovate, ovate-lanceolate, suborbicular, or spatulate, 3.5–7 × 2–4 cm. Capitula 2–3 cm in diam.

- Low mountain slopes, hills; 300–1500 m. Anhui, Henan, Hubei, Shaanxi.


\[4.5–5 \text{ cm in diam.}]

- Shaded slopes, stream sides; ca. 1500 m. Anhui, ?Henan.


\[1.1 \text{ cm. Ray floret lamina yellow, 1–1.3 cm, apex entire or 3-denticulate. Achenes 1.5–1.8 mm. Fl. and fr. Jun–Nov. 2n = 18, 35–38, 36*, 40, 54.} \]

Grasslands on mountain slopes, thickets, wet places by rivers, fields, roadsides, saline places by seashores, under shrubs; 100–2900 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Taiwan, Yunnan [Butan, India, Japan, Korea, Nepal, Russia, Uzbekistan].

Chrysanthemum indicum is one of the main parents of the florists’ chrysanthemum, “C. grandiflorum” (see note under genus). The natural distribution within China is not clear because of confusion with cultivated plants in the “C. grandiflorum” complex.


\[xiao hong ju\]

Chrysanthemum erybescens Stapf; C. maximoviczianum Y. Ling; C. maximoviczianum var. aristatomucronatum Y. Ling; Dendranthema chanetii (H. Léveillé) C. Shih; D. erubescens (Stapf) Tzvelev.

Herbs, perennial, 15–60 cm tall, with procumbent rhizomes. Stems erect, branched from base or middle, but usually apically corymbosely branched, sparsely pubescent especially below capitula, rarely glabrous. Lower and middle stem leaves: petiole 3–5 cm; leaf blade reniform, suborbicular, or broadly ovate, 2–5 cm, ca. as long as wide, both surfaces green, sparsely pilose or glabrous, base slightly cordate or truncate, palmate or palmate-pinnate, 3–5–lobed, rarely -partite; lobe margins obtusely dentate, lateral lobes small, terminal ones large. Upper stem leaves elliptic or narrowly elliptic, narrowly elliptic or broadly linear near synflorescence. Synflorescence a terminal flat-topped cyme. Capitula 3–12. Involutiones cup-shaped, 5–15 mm in diam.; phyllaries in 4 or 5 rows, outer ones linear or linear-lanceolate, 3–4 mm, adaxially densely pubescent, middle and inner ones elliptic, 4–5 mm, middle ones densely pubescent abaxially, inner ones glabrescent abaxially. Ray floret lamina white, ca. 8 mm, apex 3-denticulate. Achenes ca. 1 mm. Fl. and fr. Oct.

- Mountain slopes. NE Chongqing (Wushan).


\[ye ju\]

Chrysanthemum indicum var. coreanum H. Léveillé; C. indicum var. edule Kitamura; C. indicum var. hibernum Makino; C. indicum var. litorale Y. Ling; C. indicum var. lushahense (Kitamura) Handel-Mazzetti; C. lushanense Kitamura; C. nankingense Handel-Mazzetti; C. procumbens Loureiro; C. sabini Lindley; Dendranthema indicum (Linnaeus) Des Moulins; D. indicum var. huludaoense G. Y. Zhang, L. J. Yu & Y. J. Liu; D. nankingense (Handel-Mazzetti) X. D. Cui; Matricaria indica (Linnaeus) Desrousseaux; Pyrethrum indicum (Linnaeus) Cassini (1826), not Sims (1813); Tanacetum indicum (Linnaeus) Schultz Bipontinus.

Herbs, perennial, 0.25–1 m tall, with long or short procumbent rhizomes. Stems erect or diffuse, branched, sparsely pilose. Lower leaves withered at anthesis. Middle stem leaves: petiole 1–2 cm; leaf blade ovate, long ovate, or elliptic-ovate, 3–7(–10) × 2–4(–7) cm, both surfaces pale green or olive, sparsely pubescent or less densely so abaxially, pinnatifid, pinnatifid-obed, or inconspicuously divided, base truncate, somewhat cordate or broadly cuneate. Synflorescence a lax terminal flat-topped cyme. Capitula many or few. Phyllaries in 5 rows, scarious margin broad, white or brown, apex obtuse or rounded, outer ones ovate or ovate-triangular, 2.5–3 mm, middle ones ovate, 6–8 mm, inner ones narrowly elliptic, ca. 1.1 cm. Ray floret lamina yellow, 1–1.3 cm, apex entire or 3-denticulate. Achenes 1.5–1.8 mm. Fl. and fr. Jun–Nov. 2n = 18, 35–38, 36*, 40, 54.

Grasslands on mountain slopes, thickets, wet places by rivers, fields, roadsides, saline places by seashores, under shrubs; 100–2900 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Taiwan, Yunnan [Butan, India, Japan, Korea, Nepal, Russia, Uzbekistan].

The identity of Chrysanthemum sibiricum (Candolle) Fischer ex Komarov var. sinoalpinum Nakai (J. Jap. Bot. 16: 75. 1940) is not clear.

Liaoning, Nei Mongol, Shandong, Shanxi [Korea, Mongolia, Russia].

**Chrysanthemum zawadskii** Herbich subsp. *latilobum* (Maximowicz) Kitagawa; *C. zawadskii* var. *latilobum* (Maximowicz) Kitamura; *C. zawadskii* subsp. *naktongense* (Nakai) Y. N. Lee; *Dendranthema naktongense* (Nakai) Tzvelev; *D. zawadskii* (Herbich) Tzvelev var. *latilobum* (Maximowicz) Kitamura; *Leucanthemum sibiricum* Candolle var. *latilobum* Maximowicz.

Herbs, perennial, with procumbent rhizomes. Stems erect, 10–50 cm tall, branched above middle or apically shortly branched, rarely unbranched, sparsely pubescent, especially in upper part and near synflorescence or glabrescent to glabrous. Middle stem leaves long petiolate; leaf blade elliptic to narrowly elliptic or ovate, 1–3 × 1–2 cm, both surfaces glabrous or soon glabrescent, palmate-pinnately 3–7-lobed or -parted, base cuneate or broadly cuneate. Distal stem leaves obovate, ob lanceolate, or narrowly ob lanceolate, 3–5-divided or entire. Synflorescence a lax terminal flat-topped cyme. Capitula 2–9, 3.5–5 cm in diam. Involucres cup-shaped, 1–1.5 cm in diam.; phyllaries in 4 rows, abaxially glabrous, abaxially densely silvery sericeous, adaxially green, appressed pubescent, glabrescent, palmately pinnatifid or 3-fid, segments dentate, base cuneate into petiole, margin dentate, apex acute to obtuse. Capitula 2.5–3 cm in diam., solitary, long pedunculate. Involucres subhemispheric, ca. 15 × 7–8 mm; phyllaries with margin brown, outer ones ovate to oblong, middle and inner ones broadly ovate. Ray florets white; lamina ca. 15 × 4 mm; disk florets greenish yellow, ca. 3.5 mm, 5-toothed. Achenes ca. 2 mm, 5-grooved. Abaxially densely silvery sericeous, adaxially sparsely hairy, pinnatifid or pinnatipartite. Uppermost and lowestmost leaves smaller. Capitula ca. 2 cm in diam., solitary, long pedunculate. Involucres subglobose, ca. 5 × 10–13 mm; outer phyllaries 3–6 × 1–3 mm, inner ones 4–6 × 2–3 mm. Ray florets white; lamina ca. 6 × 2.5 mm; disk florets greenish yellow, ca. 2 mm.

- Rocky slopes; 1200–1400 m. Taiwan.


森氏菊 *sen shi ju*

**Dendranthema morii** (Hayata) Kitamura.

Herbs, perennial, with creeping rhizomes. Stems ascending, few branched, densely silvery sericeous, glabrescent. Stems leaves with petiole 7–17 mm; leaf blade broadly ovate to obovate, 2.5–4 × 1.5–2.5 cm, abaxially densely silvery sericeous, adaxially green, appressed pubescent, glabrescent, palmately pinnatifid or 3-fid, segments dentate, base cuneate into petiole, margin dentate, apex acute to obtuse. Capitula 2.5–3 cm in diam., solitary, long pedunculate. Involucres subhemispheric, ca. 15 × 7–8 mm; phyllaries with margin brown, outer ones ovate to oblong, middle and inner ones broadly ovate. Ray florets white; lamina ca. 15 × 4 mm; disk florets greenish yellow, ca. 3.5 mm, 5-toothed. Achenes ca. 2 mm, 5-grooved.

- Limestone cliffs, rare; 400–2400 m. Taiwan.


yellow small mountain *huang hua xiao shan ju*

**Chrysanthemum licentianum** W. C. Wu; *C. neo-oreastrum* C. C. Chang; **Dendranthema hypargyreum** (Diels) Y. Ling & C. Shih.

Herbs, perennial, 5–25 cm tall, with procumbent rhizomes. Stems erect, unbranched, sparsely pubescent or villous. Basal leaves: petiole to 2 cm; leaf blade flabelliform or broadly ovate, 0.4–1.6 × 0.8–1.6 cm, abaxially sparsely or densely pubescent, adaxially glabrescent to glabrous, 2-pinnatisect or bipinnatipinnatisect; ultimate segments linear or broadly linear. Lower and middle stem leaves similar to basal leaves but smaller. Upper stem leaves usually pinnatisect, uppermost leaves 3-partite. Capitulum solitary, terminal, 2.3–5.5 cm in diam. Involucres cup-shaped, 1–2 cm in diam.; phyllaries in 4 rows, abaxially glabrous or sparsely villous, margin brown, outer ones linear or linear-lanceolate, 5–6 mm, middle and inner ones lanceolate or elliptic, 7–9 mm. Ray floret lamina yellow, 6–12 mm. Fl. Sep.

- Meadows on mountain slopes; 1400–3900 m. Shaanxi, Sichuan.


小山菊 *xiao shan ju*

**Chrysanthemum sibiricum** (Candolle) Fischer ex Komarov var. *alpinum* Nakai; *C. zawadskii* Herbich var. *alpinum* (Nakai)

Herbs, perennial. Stems in clumps, erect, densely silvery sericeous. Stem leaves obovate in outline, 1–3 × 0.5–2 cm, abaxially densely silvery sericeous, adaxially sparsely hairy, pinnatifid or pinnatifid. Uppermost and lowestmost leaves smaller. Capitula ca. 2 cm in diam., solitary, long pedunculate. Involucres subglobose, ca. 5 × 10–13 mm; outer phyllaries 3–6 × 1–3 mm, inner ones 4–6 × 2–3 mm. Ray florets white; lamina ca. 6 × 2.5 mm; disk florets greenish yellow, ca. 2 mm.

- Rocky slopes; 1200–1400 m. Taiwan.
Kitamura; *Dendranthema oreastrum* (Hance) Y. Ling; *D. sichotense* Tzvelev.

Herbs, perennial, 3–45 cm tall, with procumbent rhizomes. Stems erect, solitary, unbranched or rarely shortly 1- or 2-branched, densely villous or pubescent, lower parts glabrescent to glabrous. Basal and lower stem leaves: petiole 1–5 cm; leaf blade rhomboid, flabelliform, ovate, or broadly ovate, 0.5–2.5 × 0.5–3 cm, abaxially densely villous, binate-pinnatisect; ultimate segments linear or broadly linear. Upper stem leaves similar but smaller; uppermost linear, entire. Capitula solitary, rarely 2 or 3, 2–4 cm in diam. Involucres cup-shaped; phyllaries in 4 rows, scarious margin deep or dark brown, outer ones linear, narrowly elliptic, or ovate, 5–9 mm, abaxially sparsely villous, middle and inner ones long ovate or ob lanceolate, 6–8 mm, middle ones sparsely villous abaxially, inner ones glabrous abaxially. Ray floret lamina white or pink, apex 3-denticulate. Achenes ca. 2 mm. Fl. and fr. May–Nov. 2


甘菊 gan ju

Herbs, perennial. Stems 30–150 cm, erect, corymbose branched above middle or only in upper part, pilose, especially in upper part and on synflorescence branches. Basal and lower stem leaves withered by anthesis; middle stem leaves: petiole 0.5–1 cm; leaf blade ovate, broadly ovate, elliptic-ovate, narrowly elliptic, or ovate-lanceolate, 2–7 × 1.5–4.5 cm, surfaces concolorous or nearly so, 2-pinnatisect, 2-pinnatipartite, or inconspicuously 2-pinnatipartite; primary lateral segments 2 or 3 (or 4) pairs; ultimate lobes elliptic. Upper stem leaves small, tripartite or entire. Synflorescence a lax or dense cyme. Capitula 1–1.5 cm in diam. Involucres cup-shaped, 5–7 mm in diam.; phyllaries in 5 rows, margin white or pale brown scarios, outer ones linear or linear-oblong, ca. 2.5 mm, abaxially sparsely pilose, middle and inner ones ovate, narrowly elliptic, or ob lanceolate, ca. 4.5 mm. Ray florets yellow; lamina 1–7.5 mm. Achenes 1.2–1.5 mm. Fl. and fr. May–Nov. 2n = 18*, 36*.

Mountain slopes, rocks, river valleys, riverbanks, wastelands, hilly lands; 600–2800 m. Gansu, Hebei, Hebei, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Yunnan, Zhejiang [India, Japan, Korea, Mongolia].


毛叶甘菊 mao ye gan ju

Leaves abaxially densely villous. Capitula large, 1–1.5 cm in diam. Ray floret lamina 5–7.5 mm. Leaves sparsely pubescent on both surfaces or adaxially glabrous. Capitula large, 1–1.5 cm in diam. Ray floret lamina 5–7.5 mm. 2n = 18*.

Mountain slopes; rocks, river valleys, riverbanks, wastelands, hilly lands; 600–2800 m. Gansu, Hebei, Hebei, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Xinjiang, Yunnan, Zhejiang [India, Japan, Korea, Mongolia].


1a. Ray floret lamina ca. 1 mm ............... 11c. var. *discoideum*

2a. Leaf blade abaxially densely villous or pubescent .................. 11b. var. *tomentellum*

2b. Leaf blade abaxially sparsely pubescent .............................. 11a. var. *lavandulifolium*

委陵菊 wei ling ju

*Dendranthera potentilloides* (Handel-Mazzetti) C. Shih.

Herbs, perennial, 30–70 cm tall. Stems erect or bent at base, robust, corymbose branched in upper parts, grayish white, densely and thickly pubescent pubescent. Basal and lower stem leaves shed by anthesis. Middle stem leaves shortly petiolate, with divided auricle at base of petiole; leaf blade broadly ovate, ovate, or broadly triangular-ovate, 1.5–3 × 2–3.5 cm, abaxially grayish white, densely pubescent, adaxially green or pale green, sparsely pubescent, 2-pinnatisect; primary lateral segments 2-paired; ultimate segments elliptic, margin with few teeth or 1 tooth on one side. Distal leaves gradually smaller, similar to middle stem leaves. Synflorescense a flat-topped cyme. Capitula 1.5–2 cm in diam. Involucre cup-shaped; phyllaries in 4 rows, abaxially densely pubescent, scarious margin broad, yellow, ca. 5 mm. Ray floret lamina yellow, 8–10 mm, apex minutely 2- or 3-denticulate. Fl. summer.

- Roadsides; 100–300 m. Shandong (Jinan).


阿里山菊 a li shan ju

*Dendranthera arisanense* (Hayata) Y. Ling & C. Shih.

Herbs, perennial, ca. 40 cm tall, with creeping rhizomes. Stems ascending, shortly corymbose branched from middle, densely pubescent, soon glabrescent. Lower stem leaves shed by anthesis. Middle stem leaves: petiole 1–2 cm; leaf blade ovate, 3–5 × 2–3 cm, 2-pinnatisect; primary segments 1- or 2-paired; ultimate segments obliquely triangular, abaxially grayish white, densely and thickly pubescent, adaxially green, sparsely pubescent. Distal stem leaves gradually smaller, similar to middle stem leaves. Synflorescence a terminal subumbellate panicule. Capitula many, ca. 1.2 cm in diam. Involucre cup-shaped, ca. 7 mm in diam.; phyllaries in 4 rows, scarious margin broad, white or brown, outer ones ovate or narrowly ovate, 3–4 mm, middle ones elliptic or narrowly elliptic, 4–4.5 mm, inner ones narrowly elliptic or broadly linear, ca. 3 mm. Ray floret lamina yellow, ca. 5 mm. Fl. summer. $2n = 18$.

- Jiangsu, Taiwan.


叶状菊 ye zhuang ju


Herbs, perennial, 50–80 cm tall. Stems erect, sparsely long branched above middle; stems and branches densely gray pubescent. Basal and lower stem leaves not seen. Middle stem leaves ovate or broadly ovate in outline, 2–3 × 1–1.5 cm, shallowly 2-pinnatifid, abaxially gray pubescent, adaxially sub-
broadly linear, gradually smaller, pinnatipartite or entire. Synflorescence a lax flat-topped cyme. Capitula 2–5, 1.5–4.5 cm in diam. Involucres cup-shaped; phyllaries in 4 rows, abaxially glabrous or sparsely pubescent only in outer ones, scarious margin white or brown, outer ones linear or linear-lanceolate, 3.5–8 mm, middle and inner ones elliptic or narrowly elliptic, 3–7 mm. Ray floret lamina white or purple-red, 1–2 cm, apex entire or minutely emarginate. Achenes ca. 1.8 mm. Fl. and fr. Jul–Sep. 2n = 54*, 72. Mountain slopes, streamsides, forest understoreys, grasslands, open places in forests; 800–1800 m. Anhui, Gansu, Hebei, Heilongjiang, Hunan, Shaanxi, Shandong, Shanxi [Mongolia, Russia].

Chrysanthemum zawadskii played a significant role in the development of the frost-hardy "Korean chrysanthemums."


细叶菊 xi ye ju

Dendranthema maximowiczii (Komarov) Tzvelev.

Herbs, biennial. Stems 8–30 cm tall, erect, solitary, branched above middle, lower parts sparsely pilose. Lower and middle stem leaves shortly petiolate; leaf blade ovate or broadly ovate, 2–2.5 × 2.5–3 cm, 2-pinnatisect; primary lateral segments 2-paired; ultimate segments linear or narrowly linear, apex long acuminate. Distal stem leaves and leaves below synflorescence pinnatisect. Synflorescence a lax flat-topped cyme. Capitula 2–4. Involucres shallowly cup-shaped, 1–1.5 cm in diam.; phyllaries in 4 rows, scarious margin white or brown, outer ones linear, 5–6 mm, abaxially sparsely pubescent, middle and inner ones elliptic to oblong-lanceolate, 7–8 mm, middle ones abaxially sparsely pubescent or glabrous, inner ones abaxially glabrous. Ray floret lamina white or pink, 1–1.5 cm, apex minutely 3-denticulate. Fl. Jul–Sep.

Mountain slopes, nearby lakes, sand dunes; 1200–1300 m. Nei Mongol [Korea, Russia].


拟亚菊 ni ya ju


Herbs, perennial, 60–80 cm tall. Stems erect, branched above middle, pubescent especially in middle and upper parts. Middle stem leaves ovate, obovate, or elliptic, 2.5–6 × 1.5–3 cm, 2-pinnatisect, abaxially gray-white, densely and thickly appressed pubescent, adaxially green or pale green, sparsely pubescent or glabrous; primary lateral segments 2-paired; ultimate segments lanceolate or obliquely triangular. Synflorescence a terminal flat-topped compound panicle. Capitula many. Involucres campanulate, 5–10 mm in diam.; phyllaries in 4 rows, abaxially sparsely pubescent along midvein, scarious margin brown or white, outer ones lanceolate or triangular-lanceolate, 2–3 mm, middle and inner ones narrowly elliptic, 4–5.5 mm. Ray floret lamina yellow, 1–2.5 mm, apex 2- or 3-denticulate or entire. Fl. Sep–Oct. 2n = 18*.

● Mountain slopes; 900–2600 m. Shaanxi, Sichuan, Yunnan.


异色菊 yi se ju


Herbs, perennial, ca. 30 cm tall, with robust rhizomes. Primary stems inconspicuous, much branched from base, densely pubescent, leafy. Petiole ca. 5 mm; leaf blade oblanceolate or narrowly elliptic, 1–1.5 × 0.5–1 cm, pinnatisect, abaxially white or gray-white, densely appressed pubescent, adaxially green, glabrous or nearly so, lateral segments 1-paired, narrowly elliptic or lanceolate, terminal segments similar to lateral ones, 2-dentate on one side, 1-dentate on other; apex cuneate-attenuate; leaves below capitula linear, entire. Synflorescences terminal on branches. Capitula usually solitary (or up to 3), small; peduncles densely appressed pubescent. Involucres cup-shaped, ca. 5 mm in diam.; phyllaries in 3 rows, abaxially densely pubescent, scarious margin broad, outer ones lanceolate, ca. 1.5 mm, apex rounded, brown, scarious, middle and inner ones elliptic, ca. 2.5 mm, middle ones densely pubescent abaxially, inner ones glabrous abaxially. Ray floret lamina yellow, ca. 3 mm. Achenes ca. 1 mm. Fl. and fr. Aug.

● Mountain slopes. Hebei (Neiqiu).

In the protologue, the epithet is given as "dichrom," which cannot be translated. It seems rather likely that it must be a typographical error for "dichroum," perhaps referring to the 2-colored leaf blades mentioned in the protologue.


银背菊 yin bei ju

Dendranthema argyrophyllum (Y. Ling) Y. Ling & C. Shih.

Herbs, perennial, 10–35 cm tall. Stems erect or ascending, robust branched, rarely unbranched, gray-white, densely and thickly villous. Basal leaves small, leaf blade orbicular or suborbicular; lower and middle stem leaves: petiole 2–3.5 cm; leaf blade orbicular, suborbicular, broadly elliptic, broadly ovate, or oblong-lanceolate, 2–3 × 2.5–3.5 cm, abaxially silvery, densely and thickly appressed villous, adaxially green, glabrous or glabrescent, undivided or lyrate-pinnatifid, base cordate or truncate, margin dentate or double-dentate. Upper stem leaves smaller, oblong-lanceolate or narrowly obovate, coarsely toothed or lyrate-pinnatifid. Synflorescence a terminal flat-topped cyme. Capitula 1–3 or 4, 3–4 cm in diam. Involucre cup-shaped, 2–3 cm in diam.; phyllaries in 5 rows, abaxially densely appressed pubescent, scarious margin brown or white, outer ones large, herbaceous, elliptic or oblong-lanceolate, pinnatifid, 1–1.5 cm, middle and inner ones broadly linear, linear-lanceolate, or elliptic, 8–9 mm. Ray floret lamina white, ca. 10 mm. Achenes ca. 2.2 mm. Fl. and fr. Aug–Sep.

● On rocks of mountain slopes; 1400–2100 m. Henan, Shaanxi.
蒙菊 meng ju  
Dendranthema mongolicum (Y. Ling) Tzvelev.  
Herbs, perennial, 20–30 cm tall. Stems fascicled, branched from middle or base, lower part purple-red, sparsely pilose. Lower and middle stem leaves: petiole 1.5–2 cm; leaf blade broadly ovate, suborbicular or elliptic, 1–2 × 1.5–1.8 cm, 2-pinnatisect or inconspicuously bipalmate-pinnatisect, both surfaces glabrous or sparsely pubescent; primary lateral segments 1- or 2-paired; ultimate segments triangular, apex aristate-acute. Upper stem leaves narrowly elliptic, pinnatifid; lateral lobes 2–4(-8)-paired. Synflorescence a flat-topped cyme. Capitula (1 or)2–7, 3–4.5 cm in diam. Involucres cup-shaped, 1–2 cm in diam.; phyllaries in 5 rows, abaxially glabrous, scarious margin white, outer ones leaflike, narrowly elliptic, 1–1.3 cm, pinnatilobed or pinnatimatifid, middle and inner ones narrowly elliptic, ca. 8 mm. Ray floret lamina pink or white, 15–20 mm. Achenes ca. 2 mm. Fl. and fr. Aug–Sep. 2n = 36, 54, 72.

小叶菊 xiao ye ju  
Dendranthema parvifolium (C. C. Chang) C. Shih.  
Herbs, to 100 cm or more. Stems striate, pale brown, corymbose-branched above middle, branches slender, ascending, internodes shorter than leaves. Leaves ovate in outline, ca. 1.5 × 1 cm, abaxially densely hairy, adaxially shortly pilosulous, shallowly pinnatifid, lateral segments often 2-paired, subovate, entire or 1- or 2-denticulate, acute or shortly apiculate, base cuneate into indistinct petiole, apex subacuminate. Ray florets purple, small; disk florets yellow.  
● Rocky slopes, near small rivers. Guizhou.  
Chrysanthemum parvifolium seems to be known only from the type (Cavalerie 4233, P). It was likened by the author to C. vestitum.

蒿属 hao shu  
Lin Yourun (林有润 Lin Yeou-ruenn, Ling Yuou-ruen); Christopher J. Humphries, Michael G. Gilbert

Herbs, annual or perennial, subshrubs, or shrubs, usually strongly and pleasantly aromatic, indumentum absent or of basifixed, medifixed, gland-tipped or viscid hairs. Leaves alternate, pinnate, rarely palmately divided or entire. Synflorescences racemose, sometimes spicate, usually grouped into panicles; capitula usually in 2 or more series, male or bisexual; corolla tubular, apex 5-toothed. Anthers with 2 obtuse basal appendages, apical appendage acute, style ca. as long as or longer than corolla, divergent, and with a truncate or folding and pedunculate apex, or sometimes shorter than corolla, not divergent, apex clavate or funneliform. Achenes obovoid, ovoid, or oblong, faintly striate. Corona absent or minute.

About 380 species: mainly in the N Hemisphere, also in Africa, Australia, and Central and South America; 186 species (82 endemic) in China.

Many species are rich in polyacetylenes, flavonoids, terpenoids, and cyanogenic glycosides and are well-known medicinal plants. Drugs based on artemisinin, originally derived from Artemisia annua, are particularly important for the treatment of chloroquine-resistant strains of malaria. Artemisia abrotanum Linnaeus, A. absinthium, A. dracunculus, and A. vulgaris are widely cultivated as culinary and medicinal herbs. Some are used to stabilize sand in desert or semidesert areas or as herbage for feeding livestock.

A possible record of Artemisia quinqueloba Trautvetter from China (Pampianini, Nuovo Giorn. Bot. Ital., n.s., 34: 685. 1927) cannot be confirmed, as the specimen on which it was based, “Songoria, Schrenk” (B), is no longer extant.

1a. Disk florets male, ovaries usually minute or absent; style shorter than corolla, usually not divergent, 2-cleft, with clavate or funneliform apex.
2a. Lobules of leaf blade filiform, narrowly linear, lanceolate, or subulate and less than 1.5 mm wide, or pectinate and 1–2.5 × 1–2.5 mm, or leaf blade lanceolate or linear-lanceolate; ovaries of disk florets usually minute .................................................. 6. A. sect. Dracunculus (p. 719)
2b. Lobules of leaf blade broadly linear to lanceolate or elliptic, more than (1–)1.5 mm wide, or leaf blade spatulate or obovate; ovaries of disk florets usually absent ........................................... 7. A. sect. Latilobus (p. 731)
1b. Disk florets bisexual, ovaries well developed; style ca. as long as or longer than corolla, branches divergent, recurved at apex.
3a. Receptacle pubescent or chaffy, sometimes hairs deciduous; corolla of female florets usually vasiform or narrowly conical, (2–)4-toothed .......................................................... 1. A. sect. Absinthium (p. 677)
3b. Receptacle glabrous; corolla of female florets narrowly tubular or rarely narrowly conical, 2- or 3(or 4)-toothed or without teeth.
4a. Phyllaries scarious throughout, glabrescent, midvein not green. ................................. 5. A. sect. Albibractea (p. 717)
4b. Phyllaries scarious only at margin, midvein green or sometimes brown.

5a. Plants glandular or viscid pubescent ................................................................. 4. A. sect. Viscidipubes (p. 711)
5b. Plants not glandular or viscid, puberulent or glabrescent.

6a. Capitula globose, rarely ovoid; lobules of leaf blade less than 1(–1.5) mm wide, if wider then pectinate ................................................................. 2. A. sect. Abrotanum (p. 685)
6b. Capitula ellipsoid or oblong, rarely subglobose, campanulate, or hemispheric; lobules of leaf blade more than (1.5–)2 mm wide .................................................. 3. A. sect. Artemisia (p. 694)


Absinthium Miller, Gard. Dict. Abr., ed. 4. 1754; Absyntium G. Gaertner, B. Meyer & Scherbius.

Shrubs, subshrubs, or annual, biennial, or perennial herbs, tomentose or puberulent, rarely arachnoid, without glandular or viscid hairs (sessile glands often present). Leaves 1–3-pinnatisect; lobes or lobules linear or filiform, serrate. Capitula globose or subglobose. Phyllary margin scarious. Receptacle pubescent or chaffy, hairs sometimes deciduous. Marginal florets (2–)4–30, sometimes in 2 series and up to 70; corolla vasiform or narrowly conical, (2–)4-toothed. Disk florets (8–)20–120, bisexual; ovaries well developed; style ca. as long as or longer than corolla, branches divergent, recurved at apex.

About 50 species: N Hemisphere, mostly in Asia and Europe, five species in North America, a few species in Africa and Central and South America; 23 species (three endemic) in China.

Most species contain monoterpeneoids.

1a. Annual or biennial herbs; main root solitary, vertical, tapered or ± fusiform; basal leaves (including petiole) usually less than 8 cm.

2a. Synflorescence a simple erect terminal raceme; capitula 5–10(–15) mm in diam. ......................... 1. A. macrocephala

2b. Synflorescence a panicule with spreading lateral branches; capitula 1.5–4(–6) mm in diam.

3a. Capitula 3–6 mm in diam.; marginal female florets 5–30, bisexual florets 30–120.

4a. Plants 50–150 cm tall; middle stem leaf blades 4–8(–13) × 3–6(–15) cm; female florets 20–30, often in double series, bisexual florets 80–120. .................................................. 2. A. sieversiana

4b. Plants 25–40 cm tall; middle stem leaf blades 1.5–2 × 1–1.5 cm; female florets 5–20 in single series, bisexual florets 30–50 .................................................. 22. A. succulentoides


5b. Basal leaf blades 3–4.5(–5) × 2–4 cm.

6a. Capitula 2–3(–4) mm in diam.; bisexual florets 18–28 .................................................. 20. A. anethifolia

6b. Capitula 1.5–2(–2.5) mm in diam.; bisexual florets 8–16 .................................................. 21. A. anethoides

1b. Perennial herbs, subshrubs, or shrubs; roots several, not fusiform (if biennials with single fusiform root then basal leaves 11–18 cm); basal leaves usually more than 8 cm.


8a. Plants 15–25(–30) cm tall, densely gray or yellowish tomentose ........................................... 16. A. younghusbandii

8b. Plants 25–80 cm tall, gray or yellowish arachnoid tomentose or silky pubescent, lower parts sometimes glabrescent.

9a. Middle stem leaf blades 3–5 × 3–5 cm; marginal female florets 2–5 ........................................ 18. A. fauriei

9b. Middle stem leaf blades 0.5–2 × 0.8–2.8 cm; marginal female florets 4–10.

10a. Ultimate leaf lobules narrowly spatulate, linear, or linear-oblongate, 1–3 × 0.5–1.5 mm .... 9. A. xerophytica

10b. Ultimate leaf lobules elliptic-oblongate or elliptic-lanceolate, 6–12 × 1–1.5 mm .................. 10. A. rutifolia


11a. Leaf blade entire or with apex crenately 3–5-lobed .......................................................... 12. A. lagocepha

11b. Leaf blade 1–3-pinnatisect.

12a. Capitula 2–4(–5) mm in diam.

13a. Basal to middle stem leaves with petiole 2–12 cm; plants 60–150 cm tall .......................... 5. A. absinthium

13b. Basal to middle stem leaves sessile or with petiole to 2 cm; plants 20–70 cm tall.

14a. Middle stem leaves sessile, gland-dotted ................................................................. 11. A. obtusiloba

14b. Middle stem leaves with petiole 5–20 mm, not gland-dotted.

15a. Bisexual florets 20–30; perennial herbs or occasionally subshrubs with slender rootstock; plants densely yellowish or pale yellow sericeous .................................. 6. A. frigida

15b. Bisexual florets 35–50; subshrubs with a thick woody rhizome ca. 1 cm or more in diam.; plants arachnoid puberulent, glabrescent ........................................................... 23. A. persica
12b. Capitula 4–10 mm in diam.

16a. Plants densely yellowish to yellow sericeous-tomentose; corolla with multicellular hairs; basal leaves 5–10 cm, with 7–13 pairs of lateral segments ................................................. 17. *A. stracheyi*

16b. Plants pubescent or glabrescent; corolla glabrous; basal leaves less than 5 cm, with 3–7 pairs of lateral segments, or leaves 3-cleft.

17a. Plants 10–20 cm tall.

18a. Middle stem leaves with petiole 2–3 cm, blade pubescent, later glabrescent, greenish, abaxially gland-dotted; phyllary margin black scarious ..................... 13. *A. disjuncta*

18b. Middle stem leaves with petiole 0.4–1 cm, blade densely gray or yellowish tomentose, or glabrescent, abaxially not gland-dotted; phyllary margin brown scarious.

19a. Perennial herbs; middle stem leaves with (3 or)4(or 5) pairs of segments, segments serratate or with lobules 2–8 × 0.6–1 mm, pubescent, soon glabrescent; phyllaries with brown scarious margin, glabrescent ................................................................. 14. *A. niitakayamensis*

19b. Caespitose dwarf subshrubs; middle stem leaves with 2(or 3) pairs of segments, 3–5-lobulate, lobules 1–2 × 0.5–1 mm; leaves and phyllaries densely yellowish or gray tomentose .............................................. 15. *A. minor*

17b. Plants 20–70 cm tall.

20a. Middle stem leaves (1–)1.5–4 cm, densely yellowish or white sericeous-tomentulose; middle lobes 1.5–4 mm wide.

21a. Plants 40–60(–75) cm tall; middle stem leaves elliptic or ovate; phyllary with narrow, white scarious margin ..................................................... 3. *A. sericea*

21b. Plants 20–40(–50) cm tall; middle stem leaves suborbicular or orbicular-reniform; phyllary with wide, brown scarious margin ................... 4. *A. aschurbajewii*

20b. Middle stem leaves 0.8–1.5 cm, tomentose, pubescent, or glabrescent; middle lobe less than 1 mm wide.

22a. Middle stem leaves with 5–7 pairs of segments, distal lobes pinnatisect or 3-lobulate, proximally not lobed, pubescent, glabrescent; phyllaries pubescent ............................................................................. 8. *A. rupestris*

22b. Middle stem leaves with 2 or 3(or 5) pairs of segments, segments parted or lobulate; leaves and phyllaries yellowish sericeous-tomentose or pubescent or glabrescent ......................................................... 7. *A. argyrophylla*

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大花蒿 da hua hao

*Artemisia griffithiana* Boissier; *A. sieversiana* Ehrhart ex Willdenow var. *pygmaea* Krylov.

Herbs, annual, 10–30(–50) cm tall, occasionally ± woody at base, gray puberulent or pubescent. Stems usually not branched or only shortly branched. Basal and middle stem leaves: petiole 5–12 mm; leaf blade ovate, 2–4 × 1–1.5 cm, 2-pinnatisect; segments 2 or 3 pairs, basal and middle segments 3–5-sect; lobules narrowly linear or filiform, 1–4 × 0.5–1 mm. Uppermost leaves and leaflike bracts sessile, 3-lobed or entire, leaves or lobes linear. Synflorescence a lax, simple, erect raceme. Capitula shortly pedunculate, nodding. Involucre subglobose, 5–10(–15) mm in diam.; receptacle hemispheric, densely pubescent. Marginal female florets 40–70 in 1 or 2 series; corolla vasisform or narrowly conical, (2–)4-toothed. Disk florets 80–100, bisexual. Achenes ovoid or obvoid-ellipsoid. Fl. and fr. Aug–Oct. 2n = 18, 36.

Steppes, hills, waste areas, dry places, saline or gravelly soils; 1500–5500 m. Gansu, Ningxia, Qinghai, Xinjiang, Xizang [Afghanistan, India, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan; SW Asia].

Steppes, hills, waste areas, dry places, saline or gravelly soils; 1500–5500 m. Gansu, Ningxia, Qinghai, Xinjiang, Xizang [Afghanistan, India, Kazakhstan, Kyrgyzstan, Mongolia, Pakistan, Russia, Tajikistan; SW Asia].
Roadsides, waste places, steppes, hillsides, forest margins; sea level to 4200 m. Gansu, N Guizhou, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, E and W Sichuan, Xinjiang, Xizang, W Yunnan [Afghanistan, India, Japan, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; E Europe].

The essential oils from *Artemisia sieversiana* are used in anti-inflammatory and hemostatic medicines.


绢毛蒿 juan mao hao

*Absinthium sericeum* Besser, Bull. Soc. Imp. Naturalistes Moscou 1: 237. 1829; *A. grandiflorum* Besser; *A. nitens* Steven ex Besser; *Artemisia holosericea* Ledebour; *A. holosericea* var. *grandiflora* Ledebour; *A. holosericea* var. *parviflora* Ledebour; *A. nitens* (Steven ex Besser) Steven ex Krascheninnikov; *A. sericea* var. *gmeliniana* Besser; *A. sericea* var. *grandiflora* (Ledebour) Candolle; *A. sericea* var. *ledebouriana* Besser; *A. sericea* var. *nitens* (Steven ex Besser) Candolle; *A. sericea* var. *pallassiana* Besser; *A. sericea* f. *parviflora* (Ledebour) Pampanini; *A. sericea* var. *parviflora* (Ledebour) Candolle.

Subshrubs or perennial herbs, 40–60(–75) cm tall, with thick, creeping rhizomes. Stems single to several, usually not branched, gray sericeous or stems glabrescent. Basal leaves deciduous by anthesis. Middle stem leaves: petiole 5–8 mm; leaf blade elliptic or ovate, 3–5 × 2–4 cm, 2-pinna(t)sect; segments 4(–6) pairs, distal lobes 3(lobulate or sub[palmia]tissect; lobules linear or linear-lanceolate, 10–17 × 1.5–2 mm, apex acute. Uppermost leaves and bracts pinnatissect or 3–5–sect. Synflorescence a ± narrow, racemelike panicle. Capitula shortly pedunculate, nodding. Involucrule hemispheric, densely pubescent. Marginal female florets 10–14; corolla narrowly conical or tubular, 2- or 3-toothed. Disk florets 40–60, bisexual; corolla limb puberulent. Achenes ellipsoid or ellipsoid-ovoid. Fl. and fr. Jul–Oct. 2n = 36.

Herbs, perennial, 60–150 cm tall, somewhat woody at base, gray sericeous or puberulent. Stems 1–3. Basal leaves: petiole 6–12 cm; leaf blade ovate-elliptic or ovate, 8–12 × 7–9 cm, 2- or 3-pinnatissect; segments 4 or 5 pairs, pinnately lobed; lobules lanceolate-elliptic or -linear, 8–15 × 2–4(–7) mm, apex obtuse. Middle stem leaves: petiole 2–6 cm; leaf blade ovate or ovate-elliptic, 2-pinna(t)ssect; lobules linear-lanceolate, (8–)10–25 × 2–3(–5) mm. Uppermost leaves 4–6 × 2–4 cm, pinna(t)ssect or 5-lobed; leaflike bracts 3-lobed or entire; lobes lanceolate or linear-lanceolate. Synflorescence usually a broad conical panicle; primary branches straight, ascending or ± oblique spreading, up to 30 cm and secondary branches up to 12 cm. Capitula shortly pedunculate, nodding. Involucre globose or subglobose, 2.5–3.5(–4) mm in diam.; receptacle hemispheric, densely pubescent. Marginal female florets 15–25; corolla yellow, obliquely 2-toothed. Disk florets 30–70(–90), bisexual; corolla yellow. Achenes oblong, 0.8–1 mm, with apical corona or not. Fl. and fr. Aug.–Sep. 2n = 18.

Hillsides, steppes, scrub, forest margins, often in locally moist situations; 1100–1500 m. Jiangsu, NW and W Xinjiang [Afghanistan, India, Japan, Kazakhstan, Kyrgyzstan, Pakistan, Russia; N Africa, SW Asia, Europe, North America].

*Artemisia absinthium* is used in anti-inflammatory and anthelmintic medicines.


冷蒿 leng hao

Herbs, perennial, or occasionally subshrubs, 10(–)30–60(–70) cm tall, densely yellowish or pale yellow sericeous, sometimes stem bases glabrescent. Stems several, woody at base, shortly branched or not. Lower stem leaves: petiole 5–20 mm; leaf blade obl[ong or obovate-oblong, 0.8–1.5 × 0.8–1.5 cm, 2(–3)-pinnatissect; segments 2(–4) pairs; lobules linear-lanceolate or lanceolate. Middle stem leaves: blade oblong or obovate-oblong, 5–7 × 5–7 mm, 1- or 2-pinnatissect; lobules lanceolate to linear-lanceolate, 2–3 × 0.5–1.5 mm. Uppermost leaves and bracts pinnately or 3–5-lobed. Synflorescence a spike or raceme, sometimes branched to form a panicule. Capitula nodding. Involucre hemispheric, globose, or ovoid, (2–)2.5–4.5 mm in diam.; receptacle densely white pubescent. Marginal female florets 8–13; corolla limb yellow or purple. Disk florets 20–30, bisexual. Achenes oblong or ellipsoid-ovate, with a minute apical corona. Fl. and fr. Jun–Oct. 2n = 18; (n = 9+3b, 18, 18+2b, 36).

Steppes, subalpine meadows, dry hillsides, stable dunes, dry waste
Artemisia frigida

Stems 30–60 cm; synflorescence branched; capitula 2–3 mm in diam.; corolla limb yellow ........................................ 6a. var. frigida

Stems 10–20 cm; synflorescence rarely branched; capitula 3.5–4.5 mm in diam.; corolla limb purple ............... 6b. var. atropurpurea

6a. Artemisia frigida var. frigida

冷蒿(原变种) 银叶蒿(原变种)

Absinthium frigidum (Willdenow) Besser; A. frigidum var. fischerianum Besser; A. frigidum var. wildeonanius Besser; Artemisia frigida var. fischeriana (Besser) Candolle; A. frigida var. intermedia Trautvetter; A. frigida var. mongolica Kitamura; A. frigida var. wildeoniana (Besser) Candolle.

Stems 30–60(–70) cm. Synflorescence branched to form a panicule. Capitula globose or ovoid, 2–3 mm in diam. Corolla limb yellow.

Steppes, subalpine meadows, dry hillsides, stable dunes, dry waste areas; 1000–4000 m. Gansu, W Heilongjiang, N Hebei, W Jilin, W Liaoning, Nei Mongol, Ningxia, Qinghai, N Shaanxi, Xinjiang, Xizang [Kyrgyzstan, Mongolia, Russia, Tajikistan; SW Asia, E Europe].

6b. Artemisia frigida var. atropurpurea

岩蒿 银叶蒿

Absinthium rupestre (Linnaeus) Schrank; A. rupestre var. oelandicum Besser; A. rupestre var. thuringiacum Besser; A. viride Besser; A. viridifolium (Ledebour) Besser; Artemisia dentata Willdenow; A. rupestre var. oelandica (Besser) Candolle; A. rupestre var. thuringiaca (Besser) Candolle; A. rupestre var. viridifolia (Ledebour) Candolle; A. rupestre var. viridis (Besser) Candolle; A. viridifolia Ledebour.

Herbs, perennial, usually caespitose, 20–50 cm tall, ± woody at base, pubescent, glabrescent. Stems brown or dark brown, shortly branched or not. Leaves thinly textured. Lower stem leaves petiolate. Middle stem leaves ovate-elliptic or oblong, 1.5–3(–5) × 1–2(–2.5) cm, pinnatisect; segments 5–7 pairs, pectinate, ± clasping; lobules linear-lanceolate or linear, 1–6 × 0.5–1.5 mm. Uppermost leaves and leaflike bracts pinnatisect or 3-lobed. Synflorescence a spikelike or racemelike panicule. Capitula pedunculate or sessile, nodding. Involucre globose or subglobose, 4–7 mm in diam.; phyllaries pubescent, scarios margin lacerate; receptacle hemispheric, pubescent. Marginal female florets 8–16; corolla vasiform or narrowly conical, 3- or 4-toothed. Disk florets 30–70, bisexual. Achenes oblong or oblong-ovoid, usually with a minute apical crown. Fl. and fr. Oct–Dec. 2n = 18, 34.

Dry hills, desert or semidesert steppes, grassy marshlands, dry river valleys, riverbeds, scrub, forest margins; 1100–2900 m. Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan; E and N Europe].

The whole plant is used in anti-inflammatory and hemostatic medicines.

内蒙古旱蒿  nei meng gu han hao

Subshrubs or shrubs, caespitose, 20–80 cm tall, strongly aromatic, silky puberulent, glabrescent; rootstock woody, much branched, 1.5–2.5 cm thick. Stem branches 20–30 cm long. Lower and middle stem leaves: petiole 0.3–1 cm; leaf blade suborbicular or reniform, 0.5–2 × 0.8–3 cm, 2- or 3-pinnatisect; segments 1–2 pairs, distal lobes narrowly elliptic-oblate, 1.5–2 × 0.5–1.5 mm. Uppermost leaves and leaflike bracts palmatisect, 3-lobed, or entire. Synflorescence a ± narrow spikelike panicle. Involucre 1.5–3(–4) mm in diam.; receptacle pubescent. Marginal female florets 5–30, bisexual; corolla limb puberulent or glabrescent. Achenes obovoid-oblong, ca. 1.25 mm. Fl. and fr. Jul–Oct.


诺羌香叶蒿  nuo qiang xiang ye hao


10a. Artemisia ruoqiangensis var. ruoqiangensis

叶锐缩蒿  ye rui suo hao

Subshrubs or shrubs, caespitose, 20–80 cm tall, strongly aromatic, silky puberulent, glabrescent; rootstock woody, much branched, 1.5–2.5 cm thick. Stem branches 20–30 cm long. Lower and middle stem leaves: petiole 0.3–1 cm; leaf blade suborbicular or reniform, 0.5–2 × 0.8–3 cm, 2- or 3-pinnatisect; segments 1–2 pairs, distal lobes narrowly elliptic-oblate, 1.5–2 × 0.5–1.5 mm. Uppermost leaves and leaflike bracts palmatisect, 3-lobed, or entire. Synflorescence a ± narrow spikelike panicle. Involucre 1.5–3(–4) mm in diam.; receptacle pubescent. Marginal female florets 5–30, bisexual; corolla limb puberulent or glabrescent. Achenes obovoid-oblong, ca. 1.25 mm. Fl. and fr. Jul–Oct.

10b. Artemisia ruoqiangensis var. altaica

阿尔泰香叶蒿  er tai xiang ye hao

Subshrubs or shrubs, caespitose, 20–80 cm tall, strongly aromatic, silky puberulent, glabrescent; rootstock woody, much branched, 1.5–2.5 cm thick. Stem branches 20–30 cm long. Lower and middle stem leaves: petiole 0.3–1 cm; leaf blade suborbicular or reniform, 0.5–2 × 0.8–3 cm, 2- or 3-pinnatisect; segments 1–2 pairs, distal lobes narrowly elliptic-oblate, 1.5–2 × 0.5–1.5 mm. Uppermost leaves and leaflike bracts palmatisect, 3-lobed, or entire. Synflorescence a ± narrow spikelike panicle. Involucre 1.5–3(–4) mm in diam.; receptacle pubescent. Marginal female florets 5–30, bisexual; corolla limb puberulent or glabrescent. Achenes obovoid-oblong. Fl. and fr. Jul–Oct.

10c. Artemisia ruoqiangensis var. altaica

阿尔泰香叶蒿原变种  er tai xiang ye hao yuan bian zhong

Herbs, perennial, caespitose, 10–35 cm tall, with woody rootstocks and branches, shortly branched or not, densely gray pubescent, glabrescent, purple or brown. Leaves and phyllaries densely pubescent, sometimes glabrescent; leaves usually gland-dotted. Middle stem leaves sessile, with pseudostipules; leaf blade oblong, broadly ovate, or obovate, 0.3–2 × 0.2–1.5(–1.7) cm, 1- or 2-pinnatisect and panduratisect; segments 2–4 pairs, distal lobes falcate, usually 3–5-palmatisect; lobules linear, linear-lanceolate, or elliptic-lanceolate, 1.5–6 × 0.5–1.5(–1.7) mm, rarely lacerate, apex obtuse. Uppermost leaves and leaflike bracts palmatisect or entire. Synflorescence a ± narrow spikelike panicle. Capitula sessile. Involucre globose or subglobose, 1.5–6 × 0.5–1.5(–1.7) mm in diam.; phyllaries yellowish pubescent; receptacle pubescent or glabrous. Marginal female florets 6–12. Disk florets 15–30, bisexual; corolla limb puberulent or glabrescent. Achenes ellipsoid. Fl. and fr. Jul–Aug.


钝裂蒿  dun lie hao

Herbs, perennial, caespitose, 10–35 cm tall, with woody rootstocks and branches, shortly branched or not, densely gray pubescent, glabrescent, purple or brown. Leaves and phyllaries densely pubescent, sometimes glabrescent; leaves usually gland-dotted. Middle stem leaves sessile, with pseudostipules; leaf blade oblong, broadly ovate, or obovate, 0.3–2 × 0.2–1.5(–1.7) cm, 1- or 2-pinnatisect and panduratisect; segments 2–4 pairs, distal lobes falcate, usually 3–5-palmatisect; lobules linear, linear-lanceolate, or elliptic-lanceolate, 1.5–6 × 0.5–1.5 mm, rarely lacerate, apex obtuse. Uppermost leaves and leaflike bracts palmatisect or entire. Synflorescence a ± narrow spikelike panicle. Capitula sessile. Involucre globose or broadly ovoid, 1.5–3(–4) mm in diam.; phyllaries yellowish pubescent; receptacle pubescent or glabrous. Marginal female florets 6–12. Disk florets 15–30, bisexual; corolla limb puberulent or glabrescent. Achenes ellipsoid. Fl. and fr. Jul–Aug.

10a. Artemisia ruoqiangensis var. altaica

香叶蒿(原变种) xiang ye hao (yuan bian zhong)
1b. Receptacle glabrous; leaf blade
0.3–0.7 × 0.2–0.5 cm ………………… 11b. var. glabra

11a. Artemisia obtusiloba var. obtusiloba
钝裂蒿(原变种) 见表 hao (yuan bian zhong)

Artemisia obtusiloba var. gracilis Ledebour.

Middle stem leaves: blade oblanceolate or broadly ovate, 0.6–2 × 0.5–1.5–1.7 cm, 2-pinnatisect and panduratisect; segments 2 or 3 pairs, lobules linear, linear-lanceolate, or elliptic-lanceolate, 1.5–3 × 0.5–1.5 mm, rarely lacerate, apex obtuse. Involucre 2–3(–4) mm in diam.; receptacle glabrous. Marginal female florets 6–12. Disk florets 20–30.

Dry hills, semidesert steppes, roadsides, saline-alkaline soils; 900–1700 m. N Xinjiang [Kazakhstan, Mongolia, Russia (W Siberia)].

11b. Artemisia obtusiloba var. glabra Ledebour, Fl. Altaica. 4: 70. 1833.

亮绿蒿 liang lü hao

Artemisia glabella Karelin & Kirilov; A. obtusiloba var. glabella (Karelin & Kirilov) Poljakov.

Middle stem leaves: blade oblong or broadly ovate, 0.3–0.7 × 0.2–0.5 cm, 1- or 2-pinnatisect; segments (2 or)3 or 4 pairs; lobules linear or linear-lanceolate, 3–6 × 0.5–1.5 mm. Involucre 1.5–2.5(–3.5) mm in diam.; receptacle glabrous. Female florets 6–10. Disk florets 15–25. Achenes ellipsoid. Fl. and fr. Jul–Sep.

Rocky slopes, steppes, canyons; low elevations. N Xinjiang [Russia].

Artemisia obtusiloba var. glabra has been treated as a distinct species belonging to A. sect. Arthrosum because it lacks the hairy receptacle characteristic of A. sect. Absinthium. In all other characters it is a good match with A. obtusiloba.

12. Artemisia lagocephala (Fischer ex Besser) Candolle, Prodr. 6: 122. 1838.

白山蒿 bai shan hao


Subshrubs or herbs, caespitose, 40–80 cm tall, with woody rootstock, shortly branched, densely gray or brownish pubescent. Lowermost and middle stem leaves sessile, spatulate, elliptic-oblancoate, or lanceolate, 3–6 × 0.3–1 cm, 3–5-crenately cleft or entire apically, cuneate basally, lacerate and serrate. Upper leaves and leaflike bracts lanceolate or linear-lanceolate, apex obtuse or acute. Synflorescence a racemelike panicle. Capitula pedunculate. Involucrre hemispheric to subglobose, 4–6 mm in diam.; receptacle hemispheric, pubescent. Marginal female florets 7–10; corolla 3(or 4)-toothed. Disk florets 30–80, bisexual; corolla limb puberulent. Achenes ellipsoid or obovoid. Fl. and fr. Aug–Oct. 2n = 18.

Hills, rocky slopes, ridges, outer forest margins, roadsides, forest steppes; below 2600 m. Heilongjiang, Jilin, E Nei Mongol, Sichuan [E Russia].

Material of this species has sometimes been included within Artemisia chinesis (here treated as Cossostephium chinesis). Komarov (Fl. Manshur. 3: 668. 1907) placed material of this taxon within A. stelleriana Besser. Krasnoborov (Fl. Siber. 13: 136–137. 1997) recognized A. kruhsiana as distinct:

Artemisia kruhsiana is distinguished by florets glabrous (vs. florets pubescent with slender crispate hairs in A. lagocephala); leaves white tomentose abaxially, fairly deeply once or twice trisect on vegetative shoots (vs. radical leaves gray tomentose abaxially, rather shallowly 3-lobate, with 3 teeth or entire in A. lagocephala); and plants to 40 cm tall (vs. plants 40–80 cm tall in A. lagocephala).


矮丛光蒿 ai cong guang hao

Herbs, perennial, caespitose, 10–15 cm tall, with woody rootstock, usually not branched. Basal and lower stem leaves: petiole 20–30 mm, ± clasping; basal leaf blades oblong or elliptic, 4–6 × 2–4 cm, abaxially gland-dotted, 2– or 3-pinnatipartite or -sect; segments 3 or 4 pairs; lobes 2- or 3-partite; lobules elliptic-lanceolate or lanceolate, occasionally 1–3-serrate; rachis narrowly winged. Uppermost leaves oblong, 1(or 2)-pinnatipartite, 10–20 × 5–18 mm, leaflike bracts minute, pinnatipartite or entire. Synflorescence racemelike. Capitula nodding; peduncle 5–15 mm. Involucre subglobose, 5–8 mm in diam.; phyllaries glabrescent, scarious margin brown; receptacle convex, pubescent. Marginal female florets 8–12. Disk florets 30–50, bisexual; corolla limb puberulent. Achenes ovoid-ellipsoid. Fl. and fr. Aug–Oct.

Slopes or rocky hills; 1700–2700 m. E Xinjiang [W Mongolia].


玉山艾 yu shan ai

Herbs, perennial, 10–20 cm tall, with ± woody rootstock and branches, most parts puberulent, glabrescent. Basal and middle stem leaves: petiole 5–10 mm; leaf blade ovate or obovate, 1–2.5 × 0.7–1.6 cm, 2-pinnatisect; segments (3 or)4(or 5) pairs, serrate or lobulate; lobules 2–4 pairs, pectinate, 2–8 × 0.6–1 mm. Uppermost leaves and leaflike bracts 1- or 2-pinnatipartite or -partite or entire, lobes or entire leaves lanceolate. Synflorescence racemelike. Capitula few, apically congested; peduncle 5–20 mm. Involucrre hemispheric, 7–10 mm in diam.; phyllaries glabrescent, scarious margin brown, lacerate; receptacle convex, pubescent. Marginal female florets 10–18, (2 or)3- or 4-toothed. Disk florets 40–60, bisexual. Achenes oblong or obovoid-oblong. Fl. and fr. Aug–Sep.

● Alpine situations; 3000–3800 m. Taiwan.


垫型蒿 dian xing hao

Artemisia sieversiana Ehrhart ex Willdenow var. tibetica
Artemisia stracheyi (C. B. Clarke) J. D. Hooker & Thomson

Herbs or dwarf subshrubs, caespitose, 10–15 cm tall, with horizontally creeping thick woody rootstock and branches, stems covered with broad dry leaf bases, most parts densely gray or yellowish silky-villous. Basal and middle stem leaves: petiole 0.4–0.8 cm; leaf blade suborbicular, flabellate, or reniform, (0.4–)0.6–1.2 × 0.5–1 cm, 2-pinnatisect; segments 2( or) 3 pairs, narrowly obovate, 1–2 × 0.5–1 mm, apex obtuse. Uppermost leaves and leaflike bracts minute, pinnatisect or 3-lobed or entire. Synflorescence spikelike or racemelike. Capitula usually 5(–6) in a multiform or racemelike synflorescence. Involucre ovoid or obovoid, 2–3 × 0.5–1 cm, apex obtuse. Female capitula 3(–4) mm in diam.; receptacle hemispheric, pubescent. Marginal female florets 4–10. Disk florets 50–60, bisexual; corolla with adhering multicellular hairs. Achenes obovoid. Fl. and fr. Jul–Nov. 2n = 18.

Hills, floodlands, lakesides, rocky slopes, meadows, shrublands; 4300–5200 m. Xizang [N India, N Pakistan].

Artemisia fukudo Makino var. mokpensis Pampanini; A. haichowensis C. C. Chang.

Herbs, perennial, 20–40 cm tall, root solitary; most parts gray and arachnoid tomentose, glabrescent. Basal leaves ± in rosette, soon withering; petiole 5–13 cm; leaf blade ovate or broadly ovate, 11–18 × 8–16 cm, 3- or 4-pinnatisect; lobules filiform, (10–)15–30 × 0.5–1.5 mm. Middle and upper stem leaves: leaf blade broadly ovate, 3–5 × 3–5 cm, 2- or 3-pinnatisect; segments 3 or 4 pairs; lobules filiform, 5–15 × 0.5–1.5 mm. Uppermost leaves and leaflike bracts 3–5-pinnatisect or entire; lobes of entire leaves 1–3 cm. Synflorescence a panicle with ascending main branches and many short lateral racemes. Capitula pedunculate, nodding. Involucres obovoid or obovoid– 2–3(–4) mm in diam.; receptacle pubescent. Marginal female florets 2–5. Disk florets 8–15, bisexual. Achenes obovoid, slightly compressed. Fl. and fr. Aug–Oct.

Coastal beaches, sand banks of sea and river mouths; near sea level. Hebei, Liaoning, Shandong [Japan, Korea].

The original concept of Artemisia fauriei also included Faurie 361, now the type of A. nakaii, which differs by its biennial habit and basal leaves with shorter, 6–15 mm, filiform lobules.

Artemisia nakaii (C. B. Clarke) J. D. Hooker & Thomson ex C. B. Clarke, Compos. Ind. 164. 1876.

Herbs, biennial, 30–60 cm tall, long branched, densely arachnoid and sericeous pubescent or glabrescent. Basal leaves ± forming rosettes; petiole 4–10 cm; leaf blade suborbicular or ovate, 8–15 × 8–15 cm, 3-pinnatisect; lobules filiform, 6–15 mm. Lower and middle stem leaves: leaf blade orbicular or ovate, 1.5–8 × 0.8–1.5 cm, 1- or 2-pinnatisect; segments 2 or 3 pairs; lobules linear or filiform, 4–15 × ca. 0.5 mm. Uppermost leaves and leaflike bracts 1(–2)-pinnatisect. Synflorescence a narrow to broad panicle. Capitula nodding. Involucres obovoid or oboconical, (2–)3(–4) mm in diam.; phyllaries minutely tomentose, ± glabrescent; receptacle white pubescent. Marginal female florets 2–5. Disk florets 8–16, bisexual. Achenes obovoid-ellipsoid. Fl. and fr. Aug–Oct.

Sand banks along rivers, grasslands; low elevations. Hebei, Liaoning, SE Nei Mongol [Korea].

Artemisia nakaii is based on the gathering Faurie 361, originally included within A. fauriei, which differs by its perennial habit and basal leaves with longer, (10–)15–30 mm, filiform lobules.

Artemisia anethifolia Weber ex Stechmann, Artemis. 29. 1775.

Herbs, biennial, 30–60 cm tall, long branched, densely arachnoid and sericeous pubescent or glabrescent. Basal leaves ± forming rosettes; petiole 4–10 cm; leaf blade suborbicular or ovate, 8–15 × 8–15 cm, 3-pinnatisect; lobules filiform, 6–15 mm. Lower and middle stem leaves: leaf blade orbicular or ovate, 1.5–8 × 0.8–1.5 cm, 1- or 2-pinnatisect; segments 2 or 3 pairs; lobules linear or filiform, 4–15 × ca. 0.5 mm. Uppermost leaves and leaflike bracts 1(–2)-pinnatisect. Synflorescence a narrow to broad panicle. Capitula nodding. Involucres obovoid or oboconical, (2–)3(–4) mm in diam.; phyllaries minutely tomentose, ± glabrescent; receptacle white pubescent. Marginal female florets 2–5. Disk florets 8–16, bisexual. Achenes obovoid-ellipsoid. Fl. and fr. Aug–Oct.

Sand banks along rivers, grasslands; low elevations. Hebei, Liaoning, SE Nei Mongol [Korea].
Absinthium divaricatum Fischer ex Besser; Artemisia anethifolia var. erectiflora Candolle; A. anethifolia f. gracilis Panpanini; A. anethifolia var. multicaulis (Ledebour) Candolle; A. anethifolia f. shansiensis Panpanini; A. anethifolia var. stelleriana Candolle; A. multicaulis Ledebour.

Herbs, annual or biennial, 20–55 cm tall, stems sometimes very slender; all parts pubescent, often glabrescent. Basal leaves elliptic or ovate-elliptic in outline, 3–4.5 × 1.5–2.5(–3) cm, 2- or 3-pinnatisect; segments 3 or 4 pairs, distal lateral lobes lobulate; lobules filiform, 6–12 × 0.5–1.5 mm. Uppermost leaves and leaflike bracts 3–5-lobed or entire. Synflorescence a broad panicle with flowering shoots from most upper nodes. Capitula closely to widely spaced, pedunculate, often bracteolate. Involucre hemispheric or broadly ovoid, wider than long, 2–3(–4) mm in diam.; phyllaries ± densely puberulent, sometimes ± glabrescent; receptacle convex, white pubescent. Marginal female florets 3–6. Disk florets 18–28, bisexual; corolla limb yellow or red. Achenes ellipsoid or obovoid. Fl. and fr. Aug–Oct.

Slopes, dry canyons, saline soils, saline steppes, wastelands, stable dunes, Hippophae thickets; 800–2500 m. Gansu, Hebei, W Heilongjiang, Nei Mongol, Ningxia, Qinghai, Shaanxi, N Shanxi, Xinjiang [Mongolia, Russia].

This species is used as herbage for feeding livestock.


肉质叶蒿  shi lu hao

*Artemisia anethoides* Weber ex Stechmann var. anethoides (Mattfeld) Pampanini; *A. zhaozongensis* G. Y. Chang & M. Y. Liou.

Herbs, annual or biennial, 30–60(–90) cm tall, gray pubescent. Basal and lowermost stem leaves: leaf blade ovate or elliptic-ovate, 3–4(–5) × 2–4 cm, 3( or 4)-pinnatisect; lobules filiform or linear-lanceolate. Middle stem leaves: leaf blade ovate or broadly ovate in outline, 2–4 × 1–3 cm, 2- or 3-pinnatisect; segments (1 or) 2 or 3 pairs; lobules filiform, 2–5 × 0.3–0.5 mm. Uppermost leaves and leaflike bracts 3–5 lobed or entire. Synflorescence a narrow panicle, to 15 × 3 cm, most nodes producing racemes or flowering branches to form a broad compound panicle. Capitula many, pedunculate, bracteolate, nodding. Involucre subglobose, 1.5–2(–2.5) mm in diam.; phyllaries and receptacle densely pubescent. Marginal female florets 3–6. Disk florets 8–16, bisexual. Achenes obovoid. Fl. and fr. Jul–Oct.

Hills, slopes, saline soils, sand banks of rivers and lakes, roadsides, wastelands, steppes, semidesert steppes, desert forests; low elevations to 3300 m. Gansu, Hebei, Heilongjiang, N Henan, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, N Shanxi, Xinjiang, Xizang [Mongolia, Russia].

*Artemisia anethoides* is used for feeding livestock.


肉质叶蒿  rou zhi ye hao

Herbs, annual or biennial, 25–40 cm tall, puberulent, glabrescent. Middle stem leaves: petiole 1.5–2.5 cm; leaf blade ovate, 1.5–2 × 1–1.5 cm, 1- or 2-pinnatisect; segments 2 or 3 pairs, deeply pectinately serrate; teeth obsolete, gland-tipped. Middle and upper stem leaves pinnatifid or entire. Uppermost leaves linear; leaflike bracts linear or linear-lanceolate, 10–25 × 1–1.5 mm. Synflorescence a broad panicle. Capitula nodding. Involucre globose or hemispheric, 3–5 mm in diam.; receptacle densely white pubescent. Marginal female florets 5–20. Disk florets 30–50, bisexual; corolla limb puberulent. Achenes minute. Fl. and fr. Aug–Oct.

Grasslands, sandy riverbanks; 3700–3800 m. Xizang (Lhasa).


伊朗蒿 yi lang hao

Herbs or subshrubs, 25–70 cm tall, much branched, arachnoid pubescent, glabrescent, with thick and woody rootstock and basal branches, branchlets ascending or erect, spine-tipped or not, densely leafy. Lower and middle stem leaves: petiole 0.5–1 cm; leaf blade suborbicular or ovate, 1.2–3.5(–4.5) × (0.8)–1.5–2.5 cm, 2- or 3-pinnatisect; segments 3–5 pairs; lobules minute, pectinately linear-lanceolate or linear, 4–6 × ca. 0.5 mm. Uppermost leaves and leaflike bracts 1- or 2-pinnatisect. Synflorescence a ± cylindric to conical panicle, to 30 × 8–12 cm; branches ascending to obliquely erect, 6–20 cm. Capitula secund, nodding; peduncles (1–2)–4 mm. Involucre hemispheric, 3–4(–5) mm in diam.; phyllaries densely arachnoid pubescent in middle, margin scarios, apex obtuse; receptacle densely pubescent, glabrescent. Florets 40–50, all yellow. Marginal female florets 10–15; corolla compressed, gland-dotted. Disk florets 35–50, bisexual; corolla limb purple, densely long puberulent or glabrescent. Achenes light brown, ellipsoid-ovoid or obovoid, ca. 1 mm. Fl. and fr. Jul–Oct. 2n = 18.

Rocky slopes, sandy beaches; 2900–4000 m. W Qinghai, Xizang [Afghanistan, N India, Kazakhstan, Kyrgyzstan, Myanmar, N Pakistan, Tajikistan; SW Asia (Iran)].

1a. Branchlets not spine-tipped 23a. *var. persica*

1b. Branchlets spine-tipped 23b. *var. subspinescens*

23a. *Artemisia persica* var. persica

伊朗蒿(原变种) yi lang hao (yuan bian zhong)

*Artemisia toshubulakensis* O. Fedtschenko.

Branchlets not spine-tipped.

Rocky slopes, sandy beaches; 2900–4000 m. W Qinghai, Xizang [Afghanistan, N India, Kazakhstan, Kyrgyzstan, Myanmar, N Pakistan, Tajikistan; SW Asia (Iran)].

*Artemisia persica* is used as an anti-inflammatory, a hemostatic, or for aiding digestion.

23b. *Artemisia persica* var. subspinescens (Boissier) Boissier, Fl. Orient. 3: 374. 1875.

微刺伊朗蒿 wei ci yi lang hao


Branches and branchlets with hard, thorny tips.

Xizang [Afghanistan; SW Asia (S Iran)].

*Abrotanum* Duhamel du Monceau, Traité Arbres Arbust. 1: 19. 1755.

Herbs, annual or perennial, rarely subshrubs, pubescent, tomentose, or glabrous, rarely arachnoid, without glandular or viscid hairs (sessile glands often present). Leaves 2–4-pinnatisect; lobules pectinate, filiform, narrowly linear, or lanceolate, less than 1(–1.5) mm wide. Capitula hemispheric, globose, or subglobe, rarely ovoid. Phyllary margins scarious, midvein green or sometimes colored. Receptacle glabrous. Marginal florets (1–)3–20; corolla narrowly tubular or rarely narrowly conical, 2– or 3(or 4)-toothed or without teeth. Disk florets (7–)10–80, bisexual, ovaries well developed; style ca. as long as or longer than corolla, branches divergent, recurved at apex.

About 65 species: N Hemisphere, mostly in Asia and Europe, a few species extending into N Africa, Oceania, and the Americas; 30 species (seven endemic) in China.

Most species contain mainly monoterpenoids and also a few sesquiterpenoids. This section has been confused with *Artemisia sect. Artemisia*.

1a. Leaves pinnatisect, with ultimate lobules filiform, linear-filiform, filiform-clavate, narrowly lanceolate, or linear-lanceolate, (5–)10+ × 0.5–1(–1.5) mm, apex acute.

1b. Leaves pinnatipartite or pinnatisect, with ultimate lobules pectinate, filiform, narrowly linear, or lanceolate, less than 1(–1.5) mm wide. Capitula hemispheric, globose, or subglobe, rarely ovoid. Phyllary margins scarious, midvein green or sometimes colored. Receptacle glabrous. Marginal florets (1–)3–20; corolla narrowly tubular or rarely narrowly conical, 2– or 3(or 4)-toothed or without teeth. Disk florets (7–)10–80, bisexual, ovaries well developed; style ca. as long as or longer than corolla, branches divergent, recurved at apex.

About 65 species: N Hemisphere, mostly in Asia and Europe, a few species extending into N Africa, Oceania, and the Americas; 30 species (seven endemic) in China.

1a. Leaves pinnatisect, with ultimate lobules filiform, linear-filiform, filiform-clavate, narrowly lanceolate, or linear-lanceolate, (5–)10+ × 0.5–1(–1.5) mm, apex acute.

1b. Leaves pinnatipartite or pinnatisect, with ultimate lobules pectinate, filiform, narrowly linear, or lanceolate, less than 1(–1.5) mm wide. Capitula hemispheric, globose, or subglobe, rarely ovoid. Phyllary margins scarious, midvein green or sometimes colored. Receptacle glabrous. Marginal florets (1–)3–20; corolla narrowly tubular or rarely narrowly conical, 2– or 3(or 4)-toothed or without teeth. Disk florets (7–)10–80, bisexual, ovaries well developed; style ca. as long as or longer than corolla, branches divergent, recurved at apex.

About 65 species: N Hemisphere, mostly in Asia and Europe, a few species extending into N Africa, Oceania, and the Americas; 30 species (seven endemic) in China.
14a. Middle stem leaves abaxially gray-yellowish or yellowish and gland-dotted; leaf rachis usually not pectinate, midvein obvious, slightly prominent; capitula 1.5–2.5 mm in diam. ................................................................. 40. A. annua
14b. Middle stem leaves abaxially green, not gland-dotted; leaf rachis pectinate, midvein flat; capitula 3.5–5(–7) mm in diam. ...................................................... 39. A. caruifolia

9b. Herbs perennial or subshrubs; stems several or many, rarely solitary; roots usually woody, or herbs dwarf, less than 20 cm and with thick stock and ± fusiform root.
15a. Herbs dwarf perennial, main root ± fusiform; stem usually less than 15 cm tall; leaves 1(or 2)-pinnatisect, segments 1 or 2 pairs, without lobules or occasionally with 2 or 3 minute lobules; synflorescence spikelike .................................................................................................. 48. A. caespitosa
15b. Herbs perennial or subshrubs, roots woody; stem more than 15 cm tall; leaves 1(or 2)-pinnatisect, segments 3 or more pairs; synflorescence paniculate, racemelike, or spikelike.

16a. Capitula broadly ovoid; phyllaries gray arachnoid pubescent; lobes of leaves suborbicularly and obtusely serrate ........................................................................................................... 31. A. baimaensis
16b. Capitula hemispheric, globose, or subglobose; phyllaries puberulent, later glabrescent; lobes of leaves pinnatisect, or lobules lanceolate or linear-lanceolate, rarely linear-falcate.
17a. Middle stem leaves 1- or 2-pinnatipartite, lobules pectinate.
18a. Subshrubs; stem more than 70 cm; lobules of leaves elliptic or lanceolate and serrate; capitula 4–6 mm in diam. ................................................................................ 32. A. medioxima
18b. Herbs perennial; stem 20–70 cm; lobules of leaves pinnatisect; capitula 3–4 mm in diam. ..............................................................................................................................  35. A. latifolia
17b. Middle stem leaves 2- or 3(or 4)-pinnatisect, lobules serrate.

20a. Herbs perennial; corolla limb puberulent.
21a. Middle stem leaves pinnatisect, segments 5–7(or 8) pairs, lobes pectinate or deeply serrate; phyllaries with entire broad brown scarious margins ..................................................................................... 36. A. phaeolepis
21b. Middle stem leaves 2-pinnatisect or -partite, segments 4(or 5) pairs, lateral mid-lobes deeply 2–4-serrate; phyllaries with lacerate brown scarious margins ................................................................. 43. A. tsugitakaensis
20b. Subshrubs; corolla limb often glabrous.
22a. Petioles of middle stem leaves 6–16 cm; leaves 1(or 2)-pinnatisect, lobes minutely irregularly pectinate-serrate .............................................. 34. A. maximovicziana
22b. Petioles of middle stem leaves less than 3 cm; leaves 2 or 3(or 4)-pinnatisect, lobules minutely serrate.
23a. Middle stem leaves ± sessile, 2(or 3)-pinnatisect, lobules minutely linear or linear-lanceolate or falcate, 0.5(–1) mm wide; capitula sessile or shortly pedunculate; phyllaries pubescent ................................................................. 24. A. macrantha
23b. Middle stem leaves petiolate, 2 or 3(or 4)-pinnatisect, lobules minute, pectinate, linear, elliptic, or ovate, (0.5–)1–1.5 mm wide; capitula pedunculate; phyllaries glabrescent or puberulent.
24a. Middle stem leaves 3(or 4)-pinnatisect, segments 5–8 pairs, abaxial midvein obviously convex; peduncles 2–4 mm; phyllaries glabrescent ........................................................................................................ 26. A. polybotryoidea
24b. Middle stem leaves 2(or 3)-pinnatisect, segments 3(or 4) pairs, abaxial midvein not convex; peduncles 4–15 mm; phyllaries puberulent .............................................................................. 27. A. aksaiensis

19b. Capitula subglobose, 2.5–4 mm in diam., in panicles.
25a. Middle stem leaves with 6–8 pairs of segments, abaxially white tomentulose ........................................................................................................ 37. A. tanacetifolia
25b. Middle stem leaves with 3–5 pairs of segments, abaxially pubescent or glabrescent.
26a. Plants with short, woody vegetative shoots and slender, virgate synflorescences; petiole of middle stem leaves 0.3–0.5 cm; capitula with 16–20 disk florets ................................................................................ 33. A. freyniana
26b. Plants much branched with most shoots fertile; petiole of middle stem leaves 0.8–5 cm; capitula usually with 20–60 disk florets (A. vestita with 12–20).

亚洲大花蒿 ya zhou da hua hao

Subshrubs or herbs, 20–100 cm tall, with woody rootstock and branches, densely white pubescent. Branches 8–18 cm. Lower and middle stem leaves: leaf blade ovate or oblong, 4–8 × 2–7 cm, 2(or 3)-pinnatisect; segments 3 or 4 or 5 pairs, lobules minute, linear or linear-lanceolate, serrate, teeth 3–5(–8) × 0.5(–1) mm, apex acute, sometimes falcately curved. Uppermost leaves and leaflike bracts pinnatisect or entire; lobes or entire leaves linear-lanceolate and longer than those of flower branches. Synflorescence a ± narrow panicle. Involucre subglobose or hemispheric, 4–7 mm in diam.; phyllaries with scarious margin brown; receptacle convex. Marginal female florets 8–12. Disk florets 25–35, bisexual; corolla limb puberulent or glabrescent, lobules serrate or pectinate; capitula with 20–40 disk florets. Achenes obovoid. Fl. and fr. Aug–Oct. 2n = 108.

Canvons, steppes, meadows, shrublands, waysides; low elevations to 1500 m. W Nei Mongol, E Xinjiang [Kazakhstan, Kyrgyzstan, Mongolia, Russia, Tajikistan, Turkmenerstan, Uzbekistan; SW Asia].


西北蒿 xi bei hao

Subshrubs or herbs, 30–60(–100) cm tall, with woody rootstock and basal branches, densely white pubescent, or stem glabrescent, much branched. Basal leaves in rosettes. Leaves abaxially sparsely pubescent; basal and lower stem leaves: leaf blades ovate or broadly ovate, 2–5 × 1.5–3 cm, 2- or 3-pinnatisect. Middle stem leaves 2-pinnatisect; segments 3 or 4 pairs; lobules elliptic or linear, 3–5 × 0.5–1 mm, obtuse apically. Uppermost leaves and leaflike bracts pinnatisect or entire; lobes of entire leaves linear or linear-lanceolate. Synflorescence a ± narrow panicle. Capitula many, nodding. Involucre globose, 2.5–3(–3.5) mm in diam. Marginal female florets 8–12. Disk florets 30–40, bisexual; corolla limb puberulent or later glabrescent. Achenes obovoid. Fl. and fr. Jul–Oct. 2n = 18.

Rocky slopes, dry valleys, steppes, hills; low to middle elevations.

Gansu, Ningxia, E and N Xinjiang [Kazakhstan, Russia; C and E Europe, North America].


甘新青蒿 gan xin qing hao

Herbs, perennial, caespitose, 50–60 cm tall, with woody rootstock and branches, much branched. Leaves abaxially glabrescent or puberulent, gland-dotted; middle stem leaves: petiole 2.5–3.5 cm; leaf blade ovate or elliptic, 4–5.5 × 2.5–3.5 cm, 3(or 4)-pinnatisect; segments 5–8 pairs; lobules minute, pectinate or shortly linear, 1–3 × (0.5–)1–1.5 mm; rachis serrate, occasionally serrulate; midrib obviously prominent abaxially. Uppermost leaves and leaflike bracts 2- or 3-pinnatisect. Synflorescence of many axillary conical to cylindric panicles forming large compound panicle. Capitula many. Involucre globose, 4–5 mm in diam.; phyllaries glabrescent. Marginal female florets 8–12. Disk florets 25–35, bisexual. Achenes obovoid. Fl. and fr. Aug–Oct.

● Hills, waysides; 1000–1500 m. Gansu, Xinjiang.


阿克塞蒿 a ke sai hao

Herbs or subshrubs, caespitose, 40 cm tall or more, with woody rootstock and branches, gray puberulent or sparsely puberulent or glabrescent, much branched. Leaves gland-dotted. Lower and middle stem leaves: petiole 1–2 cm; leaf blade ovate, 2–2.5 × 1.5–2 cm, 2(or 3)-pinnatisect; segments 3(or 4) pairs; lobules minute, elliptic or ovate, 3 or 4 pairs, 2–4 × 1–1.5 mm, occasionally with 1 or 2 teeth. Uppermost leaves and leaflike bracts 1- or 2-pinnatisect. Synflorescence a broad panicle. Capitula peduncle 5–15 mm, rarely less than 4 mm. Involucre hemispheric or globose, 5–8 mm in diam.; phyllaries white puberulent. Marginal female florets 6–11. Disk florets 12–18, bisexual. Achenes obovoid. Fl. and fr. Aug–Oct.

● Hills; 3100–3800 m. W Gansu.
28. Artemisia gmelinii Weber ex Stechmann, Artemis. 30. 1775 ["gmelini"].

细裂叶莲蒿  xi lie ye lian hao

Subshrubs, caespitose, 50–100(–150) cm tall, from woody rhizomes, densely pubescent, or glabrescent. Stems branched from upper parts. Leaves gland-dotted. Middle stem leaves: petiole 1–5 cm, triangular- or elliptic-ovate, 2–10 × 2–8 cm, 2- or 3-pinnatisect; segments 3–5 pairs; lobules serratate or pectinate; rachis serrate. Uppermost leaves and leaflike bracts 1- or 2-pinnatisect or entire; lobes linear or linear-lanceolate. Synflorescence a broad panicle. Capitula nodding. Involucre globose, 2–3.5(–5) mm in diam.; phyllaries puberulent, sometimes glabrescent. Marginal female florets 10–12; corolla narrowly tubular, ca. 1.3 mm, densely gland-dotted. Disk florets 20–40, bisexual; corolla ca. 1.8 mm. Achenes ellipsoid-ovoid or ellipsoid-conical. Fl. and fr. Aug–Oct. 2n = 18, 36.

Hills, waysides, shrublands, slopes, often dominant on S slopes, roadsides, forest steppes, meadows, dry floodlands, wastelands; 1000–4900 m or below. Anhui, Gansu, Guangdong, Hebei, Heilongjiang, Henan, Hubei, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Xingjiang, Xizang; one variety widespread throughout China [Afghanistan, N India, Japan, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Nepal, N Pakistan, Russia, Tajikistan, Uzbekistan; E Europe].

Poljakov (Fl. URSS 26: 465. 1961) showed that Artemisia saccororum and the type of A. gmelinii are conspecific. Most material previously identified as A. gmelinii by Chinese authors belongs to A. stechmanniana.

1a. Leaves 2(or 3)-pinnatisect, sparsely pubescent adaxially, densely pubescent abaxially ............... 28b. var. messerschmidiana

1b. Leaves 2- or 3-pinnatisect, gray pubescent on both surfaces, sometimes glabrescent.

2a. Leaves glabrescent ......................... 28a. var. gmelinii

2b. Leaves persistently pubescent ........... 28c. var. incana

28a. Artemisia gmelinii var. gmelinii

白莲蒿(原变种) bai lian hao (yuan bian zhong)


Leaves 2- or 3-pinnatisect, both surfaces gray pubescent, later glabrescent.

Hills, waysides, shrublands, slopes, often dominant on S slopes, roadsides, forest steppes; 1500–4900 m. Anhui, Gansu, Guangdong, Hebei, Henan, Hubei, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shanxi, Sichuan, Xingjiang, Xizang [Afghanistan, N India, Japan, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Nepal, N Pakistan, Russia, Tajikistan].


密毛白莲蒿 mi mao bai lian hao

Artemisia messerschmidiana Besser, Tent. Abrot. 27. 1832; A. gmelinii var. messerschmidiana (Besser) Poljakov; A. saccororum var. messerschmidiana (Besser) Y. R. Ling.

Leaves 2(or 3)-pinnatisect, both surfaces gray or yellowish pubescent, adaxially densely pubescent, adaxially sparsely so.

Hills, waysides. Gansu, Hebei, Heilongjiang, Henan, Jiangsu, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Xingjiang [Afghanistan, Japan, Korea, Mongolia, Russia].

28c. Artemisia gmelinii var. incana (Besser) H. C. Fu in Ma, Fl. Intramongol. 6: 152. 1982.

灰莲蒿 hui lian hao

Artemisia messerschmidiana var. incana Besser, Tent. Abrot. 28. 1832; A. freyniana (Pampanini) Krascheninnikov f. discolor (Komarov) Kitagawa; A. gmelinii var. discolor (Komarov) Nakai; A. gmelinii var. vestita (Komarov) Nakai; A. saccororum f. discolor Komarov; A. saccororum f. incana (Besser) Pampanini; A. saccororum var. incana (Besser) Y. R. Ling; A. saccororum subsp. manshurica Kitamura; A. saccororum f. vestita Komarov; A. saccororum subf. vestita (Komarov) Pampini; A. vestita var. discolor (Komarov) Kitagawa.

Leaves 2- or 3-pinnatisect, abaxially gray pubescent to white tomentose, adaxially sparsely gray pubescent.

Hills, waysides, shrublands, slopes, often dominant on S slopes, roadsides, forest steppes; 1000–1300 m or below. Widespread throughout China [Japan, Korea, Mongolia].


白莲蒿 bai lian hao


Subshrubs, (7–)10–40(–80) cm tall, caespitose, with woody basal parts and branches, much branched, densely pubescent, or glabrescent except on leaves. Middle stem leaves: petiole 8–13 mm. Lower and middle stem leaves; leaf blade ovate or triangular-ovate, 2–4 × 1–2 cm, gland-dotted, gray or yellowish arachnoid pubescent, 2–4-pinnatisect; segments 4 or 5 pairs; lobules pectinately linear or linear-lanceolate, usually serrulate, teeth 1–2 × 0.2–0.5 mm. Uppermost leaves 1- or 2-pinnatisect
and leaflike bracts divided or entire; bracts lanceolate or linear- lanceolate. Synflorescence a leafy, narrowly conical panicle, 20–40 × 5–12 cm; primary branches ascending, 5–10 cm. Capitula many, shortly pedunculate or ± sessile, nodding, remote or approximate toward branch apices. Involucre globose, 3–5–(–6) mm in diam.; outer phyllaries linear-oblong, green, not scarious margined, sparsely arachnoid. Marginal female florets 10–12; corolla slender, glandular, 2-toothed. Disk florets 40–60, glabrous. Achenes brown, oblong, ca. 1 mm. Fl. and fr. Aug–Oct. 2n = 18, 54.

Hills, steps, semidesert steps, meadows, rocky slopes, scrub, dry floodlands, wastelands; 1500–4900 m. Gansu, Hubei, W Nei Mongol, Ningxia, Qinghai, Shaanxi, W Sichuan, Xizang [Kazakhstan, Korea, Kyrgyzstan, Mongolia, Russia, Tajikistan, Uzbekistan; E Europe].

Chinese material of *Artemisia stechmanniana* has been incorrectly named as *A. gmelinii*.  

**30. Artemisia vestita** Wallach ex Besser, Tent. Abrot. 25. 1832.  

*Artemisia potentillifolia* H. Léveillé (1912), not Fischer ex Sprengel (1826); *A. sacrorum* Ledebour subf. *obscura* Pampanini; *A. sacrorum* f. *platiloba* Pampanini; *A. sacrorum* var. *vestita* (Wallach ex Besser) Kitamura; *A. sacrorum* f. *wallichi-ana* Pampanini.

Subshrubs, caespitose, 50–120 cm tall, with woody root-stock and basal branches, arachnoid pubescent, especially on adaxial surface of leaves, much branched, strongly aromatic. Lower and middle stem leaves: petiole 0.8–2 cm; leaf blade ovate, elliptic-ovate, or suborbicular, (2–)3.5–7.5 × (1.5–)2–4 cm, 2(or 3)-pinnatisect; segments 4–6 pairs; lobules deeply serrate; teeth elliptic, 1–2 × 0.2–0.5 mm; rachis serrate. Uppermost leaves and leaflike bracts smaller, pinnatisect or entire; bracts lanceolate, sparsely pectinate. Synflorescence a ± broad panicle. Capitula many. Involucre broadly ovoid, 2.5–3 mm in diam.; phyllaries gray arachnoid pubescent. Marginal female florets 5–8. Disk florets 8–15, bisexual. Achenes ellipsoid-ovoid or ellipsoid-obovoid. Fl. and fr. Aug–Oct.

- Forest margins; ca. 3400 m. Qinghai.


Subshrubs or herbs, 60–125 cm tall, with thick rootstock, puberulent or glabrescent. Basal and lowermost stem leaves: petiole 6–16 cm; leaf blade ovate or orbicular-ovate, 10–18 × 8–15 cm. Middle and upper leaves: leaf blade ovate or orbicular-ovate, 10–18 × 8–15 cm, 1(or 2)-pinnaatisect or -sect; segments 5 or 6 pairs; lobes linear or linear-lanceolate, pectinate to pectinate-serrate, apex acute. Leaflike bracts 3–5-lobered or entire, linear or linear-lanceolate, 45–65 × 4–8 mm. Synflorescence a long, narrow panicle. Involucre hemispheric or spherical, 4–6 mm in diam. Marginal female florets 10–15. Disk florets 30–40, bisexual. Achenes oblong or oblong-obovoid. Fl. and fr. Jul–Oct.

Steppes, dry river valleys, hills, wastelands, forest steppes; to middle elevations. N Heilongjiang, N Nei Mongol [E Russia].


Artemisia laciniata Willdenow var. glabriuscula Ledebour; A. lacinia var. latifolia Ledebour Maximowicz; A. tanacetifolia Linnaeus var. laxa Krylov.

Herbs, perennial, 20–70 cm tall, shortly capitately branched or not apically, puberulent, soon glabrescent. Leaves gland-dotted; basal and middle stem leaves: petiole 3–6 cm, basal leaf blade oblong or ovate, (1 or)2-pinnaatisect. Lower and middle stem leaves: leaf blade elliptic-oblong or elliptic-ovate, 4–14(–18) × 2–7(–9) cm, 1– or 2-pinnaatisect; segments 5–7; lobes lanceolate or ovate-lanceolate, pectinately and deeply serrate; teeth (3–)5–13 × (1–)2–3 mm. Uppermost leaves pectinate-pinnaatisect; leaflike bracts linear, entire. Synflorescence a narrow panicle. Involucre globose or hemispheric, 3–4 mm in diam.; phyllary margin brown, lacerate. Marginal female florets 12–18. Disk florets 40–80, bisexual; corolla narrowly tubular, glandular. Achenes oblong or oblong-obovoid. Fl. and fr. Jul–Oct.

Steppes, forest steppes, outer forest margins, wastelands, shrublands; low to middle elevations. NE Gansu, W Heilongjiang, W Jilin, W Liaoning, E and N Nei Mongol [Kazakhstan, Mongolia, Russia].


Herbs, perennial, 15–40 cm tall, shortly and capitately branched, pubescent, soon glabrescent, strongly aromatic. Leaves gland-dotted. Basal leaves: petiole 3–5 cm; leaf blade 2-or 3-pinnaatisect. Middle stem leaves: petiole 3–5 cm; leaf blade elliptic or oblong, 2–6 × 1.5–3 cm, 2-pinnaatisect; segments 5–7(8) pairs; lobes pectinately or deeply serrate, sometimes serrulate, with thick margins; midvein prominent abaxially. Uppermost leaves 1- or 2-pinnaatisect; leaflike bracts lanceolate or linear, entire. Synflorescence a narrow, racemelike panicle. Capitula few, shortly pedunculate, nodding. Involucre hemispheric, 4–6 mm in diam.; scarious phyllary margin broad, brown. Marginal female florets 12–18. Disk florets 40–80, bisexual; corolla limb puberulent. Achenes oblong or oblong-obovoid. Fl. and fr. Jul–Oct. 2n = 36.

Hills, canyons, waysides, grassy marshlands, meadows, dry floodlands, outer margins of forests and shrublands, rocky hills, semidesert steppes; 2500–3600 m. Gansu, Nei Mongol, Ningxia, Qinghai, Shanxi, N Xinjiang, Xizang [Kazakhstan, Mongolia, Russia].


裂叶蒿 lie ye hao


Herbs, perennial, 50–70–90 cm tall, rootstock horizontally creeping to obliquely rising, ± woody, shortly branched apically, puberulent, glabrescent. Basal leaves long petiolate. Lower and middle stem leaves: petiole 3–12 mm; leaf blade elliptic-oblong or elliptic-ovate, 3–12 × 1.5–5(–8) cm, sparingly gland-dotted, abaxially densely hairy, adaxially glabrous or sparsely hairy, 2- to 3-pinnaatisect; segments 6–8 pairs; lobes pectinately lobulate; lobules elliptic-lanceolate, sometimes sparsely serrulate; rachis narrowly winged. Uppermost leaves and leaflike bracts 1- to 2-pinnaatisect or entire; bracts linear or linear-lanceolate. Synflorescence a few to many branched pani

Forest steppes, steppes, meadows, outer forest margins, saline soils, hills, shrublands; low elevations to 2400 m. Gansu, N Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, N Shaanxi, N Shanxi [Kazakhstan, Korea, Mongolia, Russia; C and E Europe, North America (Alaska, Canada)].

Artemisia tanacetifolia is used as herbage for feeding livestock.


商南蒿 shang nan hao

Herbs, annual or biennial, 80–150 cm tall, much branched, yellowish or gray-yellow puberulent. Basal and lower stem leaves: petiole 2–4 cm; leaf blade ovate-orticlar, (2 or)3-pinnaatisect. Middle stem leaves: leaf blade ovate or elliptic-ovate, 10–12 × 6–8 cm, 2- to 3-pinnaatisect; segments 3 or 4 pairs, 4–5 × 2–3 cm, deeply pectinately serrate; teeth 3 or 4 pairs, more than 3 mm wide. Uppermost leaves 1- or 2-pinnaatisect; leaflike bracts elliptic-lanceolate, 3–5-lobered or entire.

- Hills, outer forest margins; low to middle elevations. SW Henan, Hubei, S Shaanxi, E Sichuan, N Yunnan.

39. Artemisia caruifolia Buchanan-Hamilton ex Roxburgh, Fl. Ind., ed. 1832, 3: 422. 1832 [“carnifolia”].

**青蒿**

Herbs, annual or biennial, 30–150 cm, much branched, glabrous. Basal and lowermost stem leaves usually withering before anthesis. Middle stem leaves; petiole 5–10 mm; leaf blade oblong, oblong-ovate, or elliptic, 5–15 × 2–5.5 cm, abaxially green, 2- or 3-pinnatisect; segments 4–6 pairs, pectinate or lanceolate; lobules pectinate, acutely or acuminately serrate; rachis serrate. Uppermost leaves and leaflike bracts 1(or 2)-pinnatisect and pectinatisect. Synflorescence a moderately broad panicle. Capitula many; peduncle slender, 2–6 mm, nodding. Involucre hemispheric, 3.5–7 mm in diam.; phyllaries oblong, radiately spreading or not, scarious margin yellow. Marginal female florets 10–20; corolla ca. 1.5 mm. Disk florets 30–40, bisexual; corolla yellowish, ca. 1.8 mm. Achenes obovoid or ellipsoidal, ca. 1 mm. Fl. and fr. Jun–Sep.

Riverbanks, floodlands, waysides, outer forest margins, canyons, coastal beaches; low to high elevations. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, S Shaanxi, Shanxi, Sichuan, E Sichuan, Yunnan, Zhejiang [N China, Korea, Japan, Myanmar, Nepal, N Vietnam].

The epithet of this species has been given both as “carnifolia” and “caruifolia” and is based on the similarity of the leaves to those of *Carnum carvi* Linnaeus (Apiaceae). Both forms are therefore orthographically correct, depending on whether they are based on the genus name or the species epithet, and there is no case for regarding either as an orthographical error. The protologue actually gives the spelling as “carnifolia.” It seems rather likely that the “n” is an upside-down “u” and that the correct spelling should be “caruifolia.”

*Artemisia caruifolia* contains abrotanine used in anti-inflammatory and antifebrile drugs.

1a. Leaf margins with acuminate teeth; involucre 3.5–4.5 mm in diam., phyllaries erect after anthesis .............. 39a. var. caruifolia

1b. Leaf margins with acute teeth; involucre 4.5–7 mm in diam., phyllaries radiate after anthesis .............. 39b. var. schochii

39a. Artemisia caruifolia var. caruifolia

**青蒿 (原变种) qing hao (yu an bian zhong)**

*Artemisia apiacea* Hance; *A. caruifolia* var. *apiacea* (Hance) Pampanini; *A. thumbergiana* Maximowicz.

Middle stem leaves with lobes acuminate-serrate. Involucre 3.5–4.5 mm in diam.; phyllaries not radiate after anthesis.

Moist riverbanks, floodlands, waysides, outer forest margins, canyons, coastal beaches; low elevations. Anhui, Fujian, Guangdong, Guangxi, Guizhou, S Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, S Shaanxi, Shanxi, Sichuan, E Sichuan, Yunnan, Zhejiang [N India, Japan, Korea, Myanmar, Nepal, N Vietnam].


**黄花蒿 huang hua hao**

*Artemisia annua* f. *macrocephala* Pampanini; *A. chamoilla* C. Winkler; *A. Stewartii* C. B. Clarke; *A. wadei* Edgeworth.

Herbs, annual, 70–160(–200) cm tall, much branched, sparsely puberulent, soon glabrous, strongly aromatic. Leaves gland-dotted. Lowermost stem leaves: leaf blade ovate or triangular-ovate, 3–7 × 2–6 cm, 3(or 4)-pinnatispartite; segments 5–8(–10) pairs. Middle stem leaves: petiole 1–2 cm; leaf blade 2(or 3)-pinnatisect or pectinatisect; lobules deeply serrate to pectinate; teeth triangular, 1–2 × ca. 0.5 mm; rachis narrowly winged, sparsely serrate or not; midvein prominent adaxially. Uppermost leaves and leaflike bracts 1(or 2)-pinnatispartite. Synflorescence a panicle to 15 × 8 cm, produced from most nodes to form broad, conical compound panicle. Capitula many, shortly pedunculate, closely subtended by whorl of bracteoles, nodding. Involucre globose, 1.5–2.5 mm in diam.; phyllaries broad and scarious, ± glabrous. Marginal female florets 10–18. Disk florets 10–30, bisexual; corolla dark yellow or yellow. Achenes ellipsoidal-ovoid. Fl. and fr. Aug–Oct. 2n = 18.

Hills, waysides, wastelands, outer forest margins, steppes, dry floodlands, terraces, semidesert steppes, rocky slopes, roadsides, saline soils; 2000–3700 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [widely distributed in N Africa, Asia, Europe, and North America].

*Artemisia annua* contains, among other essential oils, artemisinin (qing hao su). It is well known in Traditional Chinese Medicine for its anti-inflammatory, antifebrile, and hemostatic properties, and artemisinin has become widely valued as an effective treatment for strains of *Plasmodium* resistant to other anti-malarial drugs.


**臭蒿 chou hao**

Herbs, annual, 15–60(–100) cm tall, purple, capitulate
branches 4–8 cm, sparingly glandular puberulent, fetid. Petioles of basal and lowermost stem leaves 4–5 cm. Basal leaves many; leaf blade rosulate or elliptic, 10–14 × 2–3.5 cm, 2-pinnatisect; segments more than 20 pairs; lobules pectinately lanceolate or triangulary serrate, 2–3 × 0.2–1 mm, acute apically. Lowermost and middle stem leaves: leaf blade elliptic, 6–12 × 2–4 cm, 2-pinnate; segments 5–10 pairs, 0.3–1.5 × 0.2–0.4 mm, lobulate and serrate; rachis serrate; midvein prominent. Uppermost leaves and leaflike bracts pinnately divided; lobes serrate. Capitula in dense narrow panicles, globose or hemispheric, 3–4(–5) mm in diam. Phyllaries with brown or purple-brown scarious margin. Marginal female florets 3–8. Disk florets 15–30, bisexual; corolla limb puberulent. Achenes oblong-obovoid. Fl. and fr. Jul–Oct.

Grassy marshlands, floodlands, rocky slopes, waysides, outer forest margins; 1000–4800(–5000) m. Gansu, SW Nei Mongol, Qinghai, W Sichuan, N Xinjiang, Xizang, W Yunnan [N India, Nepal, N Pakistan, Tajikistan].

Artemisia hedinii has anti-inflammatory, antifebrile, detoxifying, and hemostatic properties.

42. Artemisia tournefortiana

湿地蒿 shi di hao

Herbs, annual, (40–)110–150(–200) cm tall, purple-brown, puberulent or glabrescent; capitates branches 2–5 cm. Lower and middle stem leaves: petiole 2–6 cm; leaf blade elliptic-ovate or oblong, 5–18 × 2–8 cm, 2(or 3)-pinnatisect; segments 5–8 pairs, pectinately lobulate; lobules elliptic-lanceolate, 3–5 × 3–4 mm, occasionally serrulate; rachis serrate. Uppermost leaves and leaflike bracts 1- or 2-pinnatisect to ± palmatisect; segments 2 or 3 pairs; lobules filiform, 2–3 × 0.5–1 mm, apically acute; leaflike bracts subpalmatisect. Synflorescence a narrow panicle. Involucre subglobose, 2–3 mm in diam. Marginal female florets 9–12. Disk florets 35–45, bisexual. Achenes ellipsoid-ovoid. Fl. and fr. Jul–Oct.

Saline steppes, meadows, riverbanks, hills; low elevations. W Heilongjiang, E Nei Mongol [E Mongolia, E Russia].

45. Artemisia dalai-lamae

米蒿 mi hao

Subshrubs, densely caespitose, 10–20(–35) cm tall, rarely branched above base, gray puberulent, strongly aromatic. Stems ± 4-angled, leaves clustered on short shoots. Stem leaves sub-sessile; leaf blade ovate or broadly ovate, 8–12 × 7–10 mm, 1- or 2-pinnatisect to ± palmatisect; segments 2 or 3 pairs; lobules filiform-clavate or linear-filiform, 2–4 × 0.5 mm, apically obtuse. Uppermost leaves and leaflike bracts 3- or 5-lobed. Synflorescence terminal, ± spikelike, often unbranched. Capitula few, separated, sessile. Involucre hemispheric or ovoid, 3–5(–4) mm in diam. Marginal female florets 1–3. Disk florets 8–20, bisexual; corolla yellow. Achenes obovoid. Fl. and fr. Jul–Sep.

Rocky slopes, steppes, semidesert steppes, saline-alkaline soils, dry floodlands, gravelly areas, sometimes locally dominant; 1800–3200 m. W Gansu, SW Nei Mongol, Qinghai, Xizang.

46. Artemisia palustris

黑蒿 hei hao

Herbs, annual, 10–40 cm tall, much branched. Lower and middle stem leaves thin, ovate or elliptic-ovate, 2–5 × 1.5–3 cm, (1 or)2-pinnatisect; segments (2 or)3 or 4 pairs; lobules narrowly linear, 15–35 × 0.5–1 mm. Synflorescence a narrow panicle. Capitula in groups of 2–10 along branches. Involucre subglobose, 2–3 mm in diam. Marginal female florets 10–13. Disk florets 20–26, bisexual. Achenes ellipsoid. Fl. and fr. Aug–Nov. 2n = 18.
Herbs, perennial, or subshrubs, 15–50(–80) cm tall, much branched. Leaves thin.


mately 2- or 3-partite; segments 3(or 4) pairs, linear, ca. 2 mm wide, apex rounded. Lower and middle stem leaves: leaf blade elliptic-ovate, 3–5 × 3–5 cm, pinnatisect; segments 2 or 3 pairs; lobes 8–12 × 1.5–2 mm. Uppermost stem leaves 3–5–sect; leaf-like bracts narrowly linear-lanceolate, 10–30 × 1.5–2 mm. Synflorescence a moderately broad panicle, main branches ascending, relatively long. Capitula pedunculate, bracteolate, nodding. Involucre obconical, 4–5 mm in diam. Marginal female florets 10–15; corolla 1.5–2 mm. Disk florets 20–30, bisexual; ovaries well developed; style ca. as long as or longer than corolla, branches brown. Receptacle glabrous. Marginal florets (1–)3–15(–20); corolla narrowly tubular or rarely narrowly conical, 2- or 3(or 4)-usually ellipsoid or ovoid, rarely campanulate, hemispheric, or subglobose; phyllary margins scarious, midvein green or sometimes sessile glands often present). Leaves 1 or 2(or 3)-pinnatifid; segments 1–3 pairs; lobes linear-lanceolate, linear-lanceolate, 10–30 × 1.5–2 mm. Achenes obovoid-ellipsoid, 1.2–2 mm, base cuneate, apex rounded, glabrous. Fl. and fr. Jul–Oct. 2n = 16.

Coastal beaches. N Taiwan, E Zhejiang [Japan, Korea].

3. Artemisia sect. Artemisia

艾组 ai zu

Herbs, perennial, rarely subshrubs, usually arachnoid tomentose or pubescent, or glabrous, without glandular or viscid hairs (sessile glands often present). Leaves 1 or 2(or 3)-pinnatifid to pinnatisect, or entire; lobes or lobules linear, linear-lanceolate, elliptic, or narrowly elliptic; more than (1.5–)2 mm wide, lacerate, or lobules broadly serrate, more than 5 × 5 mm. Capitula usually ellipsoid or ovoid, rarely campanulate, hemispheric, or subglobose; phyllary margins scarious, midvein green or sometimes brown. Receptacle glabrous. Marginal florets (1–3)15(–20); corolla narrowly tubular or rarely narrowly conical, 2- or 3(or 4)-toothed or without teeth. Disk florets 4–45, bisexual, ovaries well developed; style ca. as long as or longer than corolla, branches divergent, recurved at apex.

About 100 species: more than 70 species in Asia and Europe, 27 species in North America, a few species in S Hemisphere; 56 species (28 endemic) in China.

Many species contain monoterpenoids and sesquiterpenoids.

1a. Leaves obviously white or brown gland-dotted, with concave reticulate venation or glands, glands deciduous.

2a. Middle stem leaves 1- or 2-pinnatisect, segments (3 or)4 or 5 pairs.

3a. Stem, branches, and phyllaries glabrous or sparsely pubescent, glabrescent; leaves brown gland-dotted, lobes acuminate ................................................................. 79. A. occidentalis inensis

3b. Stem, branches, and phyllaries pubescent; leaves white gland-dotted, lobes obtuse.

4a. Stem, branches, and phyllaries rust-colored or brown tomentose or pubescent; leaves abaxially gray tomentose; capitula hemispheric or subovoid, 3–4(–5) mm in diam., in relatively long narrow panicles .... 99. A. imponens

4b. Stem, branches, and phyllaries gray puberulent; leaves abaxially arachnoid pubescent; phyllaries puberulent initially, later glabrescent; capitula subglobose or ovoid, 1–2 mm in diam., in broad, much-branched panicles ................................................................. 61. A. zhongdianensis

2b. Middle stem leaves entire, or 2- or 3-cleft, or pinnatifid, if pinnatisect then segments 1–3 pairs only.

5a. Middle stem leaves entire or 2- or 3-cleft or -partite, mixed sparsely serrate, attenuate basally, sessile; capitula 3–4 mm in diam.; phyllaries abaxially arachnoid tomentose with dark brown center ......................... 54. A. stolonifera

5b. Middle stem leaves 1- or 2-pinnatisect, or 1- or 2-pinnatisect and then segments 1–3 pairs only; capitula 1.5–3 mm in diam.; phyllaries pubescent or not, but without dark brown center.

6a. Middle stem leaves 1- or 2-pinnatisect.

7a. Branches (3–)5–10 cm; middle stem leaves 5–10 × 3–8 cm, lobules lanceolate or linear-lanceolate, more than 3 mm wide.

8a. Middle stem leaves (1 or)2-pinnatisect, adaxially arachnoid pubescent, later glabrescent; phyllaries arachnoid tomentose ................................................................. 58. A. laven olifolia

8b. Middle stem leaves (1 or)2-pinnatisect, adaxially subglabrous; phyllaries sparsely arachnoid pubescent, later glabrescent ......................................................... 59. A. verlotorum

7b. Branches 2–3(–5) cm; middle stem leaves less than 4 × 4 cm, lobules linear, less than 3 mm wide.

9a. Leaves adaxially sparsely pubescent, abaxially densely tomentose, apex obtuse; phyllaries densely arachnoid tomentose ......................................................... 60. A. kanashiroi

9b. Leaves adaxially puberulent, later glabrescent, abaxially densely arachnoid tomentose, lobules acute; phyllaries puberulent initially, later glabrescent ........................................ 64. A. lancea

6b. Middle stem leaves 1- or 2-pinnatisect to -pinnatifid.

10a. Middle stem leaf segments 2 or 3 pairs, lobes 2–3(–4) mm wide ......................................................... 55. A. argyi


甘青小蒿 gan qing xiao hao

Herbs, annual, 20–30 cm tall, pubescent or ± glabrescent. Lower and middle stem leaves ± sessile; leaf blade oblong or elliptic, 2–3 × 1–1.5 cm, pinnatisect; segments 2(or 3) pairs; lobes linear or filiform, 5–8 × 1–2 mm. Leaflike bracts like lowermost stem leaves; bracts filiform. Synflorescence a panicle. Involucre ovoid or hemispheric, 2.5–3 mm in diam. Marginal female florets 8–12. Disk florets 10–18, bisexual. Achenes ovoid or obovoid. Fl. and fr. Jul–Oct.

● Gobi Desert, gravelly soils; 2700–3300 m. N Gansu, NW Qinghai.
10b. Middle stem leaf segments 1 or 2 pairs, lobes usually (3–)5–30 mm wide.
11a. Middle stem leaves 3-lobed, middle lobe 6–10 × 1.5–3 cm, larger than laterals, abaxially
densely gray or yellowish and arachnoid pubescent; leaf apex acuminate.
12a. Plants (30–)80–150 cm tall; phyllaries densely arachnoid pubescent; bisexual florets 7–13 .......... 56. A. gilvescens
12b. Plants 150–200 cm tall or more; phyllaries sparsely pubescent or glabrescent; bisexual
florets 12–16 ................................................. 57. A. austroyunnanensis
11b. Middle stem leaves (3 or)5-lobed, middle lobe 2–6 × 0.3–0.6(–1) cm, subequa to or slightly
larger than lateral lobes, abaxially yellow pubescent, veins sparsely puberulent; leaf apex acute.
13a. Middle lobe of leaf blade slightly larger than lateral lobes, adaxially sparsely puberulent;
capitula in broad panicles, ovoid; phyllaries pubescent ................................................................. 62. A. calophylla
13b. Middle lobe of leaf blade subequal to lateral lobes, adaxially sparsely barbate; capitula in
narrow panicles, ellipsoid; phyllaries sparsely arachnoid pubescent ............................................... 63. A. velutina

1b. Leaves without concave reticulate venation, usually not gland-dotted.
14a. Middle stem leaves entire, margin serrate or not, or 3–5-partite.
15a. Middle stem leaves palmately or ternately 3- or 5-partite.
16a. Synflorescence a lax, broad panicle; capitula 4–5 mm in diam. ......................................................... 88. A. tafelii
16b. Synflorescence a long, narrow panicle; capitula 2–2.5 mm in diam. .............................................. 105. A. selengensis
15b. Middle stem leaves entire.
17a. Leaves 8–13 cm, margin serrulate ........................................................................................................ 87. A. viridissima
17b. Leaves less than 8 cm, margin entire or occasionally 1–3-serrate or remotely toothed.
18a. Stem, branches, leaves, and phyllaries glabrous or puberulent initially, glabrescent; capitula subglobose,
ovoid, or ovoid-campanulate.
19a. Middle stem leaves widest above middle; capitula 3–5.5 mm in diam. .............................................. 106. A. keiskeana
19b. Middle stem leaves widest at or below middle; capitula 1–2 mm in diam. ........................................ 82. A. nilagirica
18b. Stem, branches, leaves, and phyllaries arachnoid tomentose and pubescent; capitula ellipsoid
or oblong.
20a. Middle stem leaves 0.3–0.6 cm wide, apex obtuse, usually entire, rarely 1- or 2-serrate ......... 84. A. subulata
20b. Middle stem leaves (0.7–)1.5–2.5(–3) cm wide, apex acuminate, 1–3-serrate or lacerate
at apex.
21a. Capitula (2.5–)3–4 mm in diam.; bisexual florets 20–30 ................................................................. 83. A. integrifolia
21b. Capitula 2–2.5 mm in diam.; bisexual florets 10–15 ................................................................. 105. A. selengensis

14b. Middle stem leaves palmately 1–3-divided.
22a. Middle stem leaves with 1 or 2 pairs of segments.
23a. Subshrubs, 10–20 cm tall; middle stem leaves 1–1.5 cm, lobe apices obtuse ............................. 69. A. muijanensis
23b. Perennial herbs, 80–200 cm tall; middle stem leaves 6–12 cm, lobe apices acuminate .......... 86. A. viridisquama
22b. Middle stem leaves with 2–6(or 7) pairs of segments.
25a. Capitula 6–10 mm in diam., synflorescence a simple terminal raceme; phyllaries densely yellowish
pubescent ................................................. 100. A. smithii
25b. Capitula 5–7 mm in diam., synflorescence a slender panicle with at least lower capitula on lateral
branches; phyllaries rust-colored pubescent ................................................................. 101. A. speciosa
26a. Capitula (3–)3.5–5 mm in diam.
27a. Leaf blade abaxially glabrous ........................................................................................................... 92. A. tainingensis
27b. Leaf blade abaxially puberulent to tomentose.
28a. Leaf blade abaxially pubescent or puberulent, sometimes arachnoid or silky.
29a. Plants 8–30 cm tall; middle stem leaves 1.5–4 × 0.5–2 cm.
30a. Phyllaries puberulent; leaf blade abaxially densely gray pubescent; plant 30–50 cm tall ........ 95. A. youngii
30b. Phyllaries densely brown-yellow tomentose; leaf blade abaxially yellowish pubescent;
plant 8–30 cm tall ........................................... 97. A. comaiensis
29b. Plants 60–130(–200) cm tall; middle stem leaves 6–22 × 4–18 cm.
31a. Middle stem leaves with 2 or 3(or 4) pairs of segments ......................................................... 70. A. robusta
31b. Middle stem leaves with (3 or)4–6 pairs of segments.
32a. Leaves 3.5–4 cm wide, lobules 5–8 mm ................................................................. 104. A. somae
32b. Leaves 4–12 cm wide, lobules 10–15 mm.
33a. Capitula subglobose; phyllaries not brown, pubescent ................................................................. 102. A. sinensis
33b. Capitula ovoid-campanulate or ovoid; phyllaries brown, glabrescent ............................. 109. A. tafelii
28b. Leaf blade abaxially tomentose, sometimes pubescent on veins.
34a. Middle stem leaves 13–19 cm ........................................................................................................ 89. A. montana
34b. Middle stem leaves 6–12 cm.
35a. Plants 8–30(–35) cm tall.
  36a. Perennial herbs; phyllaries white tomentose; female florets 13–16 ........................................... 92. *A. tainingensis*
  36b. Subshrubs; phyllaries densely pubescent; female florets 8–10.
  37a. Leaf blade abaxially densely white tomentose, adaxially sparsely sericeous-tomentose .............................................................. 103. *A. kawakamii*
  37b. Leaf blade abaxially densely gray or yellowish tomentose, adaxially glabrescent ................. 94. *A. campbellii*
35b. Plants 30–150 cm tall.
  38a. Middle stem leaves with 2 or 3 pairs of segments.
  39a. Synflorescence a ± broad panicle; phyllaries gray arachnoid tomentose; leaf blades adaxially gray tomentose when young ...................................................................................... 81. *A. igniaria*
  39b. Synflorescence a narrow panicle; phyllaries arachnoid pubescent; leaf blades adaxially sparsely arachnoid pubescent.
  40a. Leaf blade pinnatifid, adaxially glandular punctuate ................................................ 68. *A. leucophylla*
  40b. Leaf blade pinnatisect, adaxially not glandular punctuate ................................................ 85. *A. brachyphylla*
38b. Middle stem leaves with (3 or)4–6 pairs of segments.
  41a. Largest leaf blade (1.5–)3–5.5 × (1.5–)2–3 cm; plants 30–70 cm tall; female florets 5–9; bisexual florets 8–15 ............. 98. *A. orientalihengduangensis*
  41b. Largest leaf blade 6–14 × 3.5–4 cm; plants 70–130(–150) cm tall; female florets 10–20; bisexual florets 15–35.
  42a. Perennial herbs 80–150 cm tall; synflorescence a lax, much-branched, broad panicle ............................................................................................................................. 71. *A. qinlingensis*
  42b. Subshrubs 50–70 cm tall; synflorescence a narrow panicle ........................................ 90. *A. moorcroftiana*
26b. Capitula 1.5–3(–3.5) in diam., ellipsoid, oblong, ovoid, or ovoid-oblong, usually in laxer synflorescences.
  43a. Middle stem leaves with 4–6 pairs of segments.
  44a. Plants 30–40 cm tall.
  45a. Plants glabrescent; phyllaries ± glabrous; middle stem leaves 0.5–1.5 cm wide, ultimate lobules elliptic, 3–4 mm .................................................................................... 93. *A. orientalixizangensis*
  45b. Plants tomentose; phyllaries sparsely yellowish tomentose; middle stem leaves 1.5–2.5 cm wide, ultimate lobules linear-lanceolate, 5–8 mm ...................................................... 96. *A. jilongensis*
  44b. Plants (45–)50–160 cm tall.
  46a. Leaf blade abaxially sparsely gray pubescent or glabrescent ................................................. 107. *A. fulgens*
  46b. Leaf blade abaxially densely arachnoid tomentose.
  47a. Capitula 3–3.5 mm in diam., usually widely spaced along branches; female florets 10–15 ..................................................................................................................................... 71. *A. qinlingensis*
  47b. Capitula 1.5–3(–3.5) mm in diam., if more than 3 mm then densely spaced; female florets 2–10.
  48a. Middle stem leaves ± sessile; bisexual florets 8–20.
  49a. Lobules of middle stem leaves linear or linear-lanceolate ........................................... 65. *A. vulgaris*
  49b. Lobules of middle stem leaves elliptic, oblong, or serrate ........................................... 72. *A. phyllobotrys*
  48b. Middle stem leaves petiolate; bisexual florets 4–8.
  50a. Stem and branches glabrescent; middle stem leaves with petiole 1–1.5 cm, blade 4–5 cm ...................................................................................................................... 76. *A. divaricata*
  50b. Stem and branches densely intermixed gray and yellowish long pubescent and tomentose; middle stem leaves with petiole 0.3–0.5 cm, blade 6–8 cm ......................... 91. *A. abaensis*
34b. Middle stem leaves 6–12 cm.
35a. Plants 8–30(–35) cm tall.
  36a. Perennial herbs; phyllaries white tomentose; female florets 13–16 ........................................... 92. *A. tainingensis*
  36b. Subshrubs; phyllaries densely pubescent; female florets 8–10.
  37a. Leaf blade abaxially densely white tomentose, adaxially sparsely sericeous-tomentose .............................................................. 103. *A. kawakamii*
  37b. Leaf blade abaxially densely gray or yellowish tomentose, adaxially glabrescent ................. 94. *A. campbellii*
35b. Plants 30–150 cm tall.
  38a. Middle stem leaves with 2 or 3 pairs of segments.
  39a. Synflorescence a ± broad panicle; phyllaries gray arachnoid tomentose; leaf blades adaxially gray tomentose when young ...................................................................................... 81. *A. igniaria*
  39b. Synflorescence a narrow panicle; phyllaries arachnoid pubescent; leaf blades adaxially sparsely arachnoid pubescent.
  40a. Leaf blade pinnatifid, adaxially glandular punctuate ................................................ 68. *A. leucophylla*
  40b. Leaf blade pinnatisect, adaxially not glandular punctuate ................................................ 85. *A. brachyphylla*
38b. Middle stem leaves with (3 or)4–6 pairs of segments.
  41a. Largest leaf blade (1.5–)3–5.5 × (1.5–)2–3 cm; plants 30–70 cm tall; female florets 5–9; bisexual florets 8–15 ............. 98. *A. orientalihengduangensis*
  41b. Largest leaf blade 6–14 × 3.5–4 cm; plants 70–130(–150) cm tall; female florets 10–20; bisexual florets 15–35.
  42a. Perennial herbs 80–150 cm tall; synflorescence a lax, much-branched, broad panicle ............................................................................................................................. 71. *A. qinlingensis*
  42b. Subshrubs 50–70 cm tall; synflorescence a narrow panicle ........................................ 90. *A. moorcroftiana*
26b. Capitula 1.5–3(–3.5) in diam., ellipsoid, oblong, ovoid, or ovoid-oblong, usually in laxer synflorescences.
  43a. Middle stem leaves with 4–6 pairs of segments.
  44a. Plants 30–40 cm tall.
  45a. Plants glabrescent; phyllaries ± glabrous; middle stem leaves 0.5–1.5 cm wide, ultimate lobules elliptic, 3–4 mm .................................................................................... 93. *A. orientalixizangensis*
  45b. Plants tomentose; phyllaries sparsely yellowish tomentose; middle stem leaves 1.5–2.5 cm wide, ultimate lobules linear-lanceolate, 5–8 mm ...................................................... 96. *A. jilongensis*
  44b. Plants (45–)50–160 cm tall.
  46a. Leaf blade abaxially sparsely gray pubescent or glabrescent ................................................. 107. *A. fulgens*
  46b. Leaf blade abaxially densely arachnoid tomentose.
  47a. Capitula 3–3.5 mm in diam., usually widely spaced along branches; female florets 10–15 ..................................................................................................................................... 71. *A. qinlingensis*
  47b. Capitula 1.5–3(–3.5) mm in diam., if more than 3 mm then densely spaced; female florets 2–10.
  48a. Middle stem leaves ± sessile; bisexual florets 8–20.
  49a. Lobules of middle stem leaves linear or linear-lanceolate ........................................... 65. *A. vulgaris*
  49b. Lobules of middle stem leaves elliptic, oblong, or serrate ........................................... 72. *A. phyllobotrys*
  48b. Middle stem leaves petiolate; bisexual florets 4–8.
  50a. Stem and branches glabrescent; middle stem leaves with petiole 1–1.5 cm, blade 4–5 cm ...................................................................................................................... 76. *A. divaricata*
  50b. Stem and branches densely intermixed gray and yellowish long pubescent and tomentose; middle stem leaves with petiole 0.3–0.5 cm, blade 6–8 cm ......................... 91. *A. abaensis*
54. Artemisia stolonifera (Maximowicz) Komarov, Fl. Man- 
shur. 3: 676. 1907.

途中山蒿 kunai ye shan hao

Artemisia vulgaris Linnaeus var. stolonifera Maximowicz, 
1859; A. integrofolia Linnaeus var. stolonifera Maximowicz 
Pampanini; A. koidzumii Nakai var. laciniata (Nakai) Kitamura; 
A. koidzumii var. manchurica Pampanini, p.p.; A. megaglobotrys 
Nakai; A. migoana Kitamura; A. stolonifera var. laciniata Na- 
kai; A. vulgaris lusus incana Regel; A. vulgaris var. kiusiana 
Makino.

Herbs, perennial, 50–120 cm tall, sparsely gray arachnoid 
pubescent or glabrescent. Leaves ± sessile, gland-dotted adaxi- 
ally. Basal and lowest stem leaves entire, serratate. Middle 
stem leaves sessile; leaf blade ovate-elliptic, ovate-elliptic, or 
avate, 6–12 × 4–7 cm, 2- or 3-cleft or -partite to coarsely 

Regni Veg. 8: 138. 1910.

艾 ai

Herbs, perennial, or subshrubs, 80–150(–250) cm tall, with many lateral roots, shortly branched apically, gray arachnoid pubescent, strongly aromatic. Middle stem leaves: petiole 2–3 mm; leaf blade ovate, triangular-ovate, or subhombic; 5–8 × 4–7 cm, abaxially densely gray arachnoid tomentose, adaxially incanous pubescent and white gland-dotted, 1(or 2)-pinnatifipartite or -cleft; segments 2 or 3 pairs, usually sarrate, base attenuate; veins abaxially prominent. Uppermost leaves and leaflike bracts pinnatifipartite to 3-partite, or entire; bracts elliptic, elliptic-lanceolate, or lanceolate. Synflorescence a narrow panicle with branches to 10 cm, ascending, lower ones subtended by leaflike bracts. Capitula secund, not touching, subsessile. Involucre elipsoid, 2.5–3(–3.5) mm in diam.; phyllaries arachnoid pubescent, or glabrescent. Marginal female florets 6–10. Disk florets 8–12, bisexual. Achenes ovoid-oblong or oblong. Fl. and fr. Jul–Oct. 2n = 36.

Waste places, roadsides, slopes, hills, steppes, forest steppes; low elevations to 1500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Gui-zhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang [Korea, Mongolia, Russia].

Artemisia argyi is used in making important anti-inflammatory, detoxifying, and hemostatic drugs. Leaf form is very variable: plants with slender, more deeply divided, pinnatifipartite middle stem leaves have been placed in A. argyi var. gracilis Pampanini (朝鲜艾 chao xian ai), but, as such leaves are found throughout the range of the species, it does not seem worthwhile to formally separate them.


湘赣艾 xiang gan ai

Artemisia vulgaris Linnaeus var. gilvescens (Miquel) Nakai.

Artemisia vulgaris Linnaeus var. gilvescens is used medicinally.


滇南艾 dian nan ai

Artemisia burmanica Pampanini f. latifolia Pampanini; A. dubia Wallich ex Besser f. tonkinensis Pampanini.

Subshrubs, 150–200 cm tall or more, densely gray or yellowish pubescent, or glabrescent. Lowermost leaves: leaf blade ovate, 7–12 × 5–6 cm, pinnatifipartite or -cleft; segments 2(or 3) pairs, oblong or oblong-elliptic, rarely with 1 or 2 serrations. Middle stem leaves: petiole 4–10 mm; leaf blade 6–10 × 1.5–3 cm, 3(or 5)-lobed, apical lobe elliptic, lateral lobes 15–25 × 5–8 mm, apically acuminate and mucronulate. Uppermost leaves and leaflike bracts entire. Synflorescence a broad panicle. Capitula many, nodding. Involucre oblong or ovoid-oblong, 1.5–2.5(–3) mm; phyllaries sparsely pubescent, sometimes glabrescent. Marginal female florets 5–7. Disk florets 12–16, bisexual. Achenes oblong. Fl. and fr. Sep–Dec or Mar.

Grasslands, slopes, shrublands, forest margins, canyons; 800–2300 m. S and SW Yunnan [Bhutan, N India, N Myanmar, N Thailand, N Vietnam].

58. Artemisia lavandulifolia Candolle, Prodr. 6: 110. 1838 [“lavandulaefolia”].

野艾蒿 ye ai hao

Artemisia araneosa Kitamura; A. argyi H. Léveillé & Vaniot f. exigua Pampanini; A. clemensiana Pampanini; A. codonocephala Diels; A. codonocephala var. maireana Pampanini; A. grisea Pampanini; A. lavandulifolia var. pekinensis Pampanini; A. selengensis Turczaninow ex Besser lusus umbrosa (Turczaninow ex Besser) Regel; A. selengensis var. umbrosa (Turczaninow ex Besser) Ledebour; A. tristis Pampanini; A. vulgaris Linnaeus var. umbrosa Turczaninow ex Besser.

Herbs, perennial, or shrubs, 50–120(–200) cm tall; stems robust, erect, gray arachnoid pubescent, glabrous or nearly so below synflorescence. Basal and lowermost leaves withering before anthesis, long petiolate; leaf blade ovate or suborbicular, 8–13 × 7–8 cm, 2-pinnatisect. Middle stem leaves: petiole 1–2(–3) cm, base with 1- or 2-lobed pseudostipules; leaf blade ovate-elliptic, or suborbicular, 6–8 × 5–7 cm, abaxially densely tomentose, adaxially white gland-dotted and sparsely arachnoid pubescent, (1 or 2)-pinnatisect; segments 2 or 3 pairs, 30–50(–70) × 5–7(–9) mm; lobules 2 or 3 pairs, lanceolate or linear-lanceolate, serrate. Uppermost leaves and leaflike bracts pinnatisect or 3-lobed or entire; lobes or entire bracts linear-lanceolate or lanceolate. Synflorescence a narrow, leafy, conical panicle. Capitula many, pedunculate or ± sessile. Involucre elipsoid or oblong, 3.5–4.5 × 2–2.5(–3) mm in diam.; phyllaries densely arachnoid tomentose. Marginal female florets 4–9; corolla ca. 1.5 mm, glabrous. Disk florets 10–20, bisexual; corolla purple, 2–2.8 mm. Achenes oblong or obovoid, ca. 1 mm, glabrous. Fl. and fr. Jul–Oct.
Roadsides, forest margins, slopes, steppes, canyons, riverbanks or lakesides, brushlands; 400–3000 m. Anhui, Gansu, N Guangdong, N Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, NE Mongolia, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan [Japan, Korea, Mongolia, Russia].


Herbs, perennial, 50–100 cm tall, pubescent, later glabrescent. Leaves white gland-dotted adaxially and abaxially densely gray tomentose. Basal and lowermost leaves shortly petiolate; leaf blade ovate, 1- or 2-pinnatisect. Middle stem leaves ± sessile; leaf blade ovate or broadly ovate, 5–10(–13) × 3–8 cm, 1(or 2)-pinnatisect; segments 3 or 4 pairs, lanceolate or linear-lanceolate, 30–50 × 3–5 mm. Uppermost leaves 3- or 5-lobed; leaflike bracts lanceolate or elliptic-lanceolate. Capitulum in somewhat broad panicles, ellipsoid or oblong-ellipsoid, 2–2.5 mm in diam., sessile. Phyllaries glabrescent. Marginal female florets 3–6. Disk florets 8–18, bisexual. Achenes oblong or oblongoid. Fl. and fr. Jul–Oct.

Hills, roadsides, waste areas; sea level to 2000 m. Anhui, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, S NE Mongolia, S Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [E, S, and SE Asia, C, E, and W Europe, North and South America, Oceania].


Subshrubs, 50–200 cm tall, yellowish pubescent. Basal and lowermost leaves shortly petiolate; leaf blade ovate or broadly ovate, 1- or 2-pinnatisect. Middle stem leaves: leaf blade broadly ovate, 6–11 × 3–9 cm, abaxially densely gray tomentose with sparsely pubescent veins, adaxially gland-dotted and sparsely puberulent, pinnatipartite; segments (1 or)2 pairs, lanceolate or linear-lanceolate, 30–60 × 3–6(–10) mm. Uppermost leaves and leaflike bracts lanceolate or linear-lanceolate. Synflorescence a narrow panicle. Involucre ovoid, 2–2.5 mm; phyllaries sparsely pubescent. Marginal female florets 5 or 6. Disk florets 10–13, bisexual. Achenes oblongoid. Fl. and fr. Jul–Oct.

● Forest margins, slopes, scrub; ca. 2700 m. NW Yunnan.


Herbs, perennial, 80–100 cm or more tall, pubescent. Leaves white gland-dotted and sparsely pubescent adaxially, densely gray arachnoid pubescent abaxially. Middle stem leaves: petiole 1.5–3 cm; leaf blade broadly ovate or ovate, 6–8 × 5–8 cm, 2(or 3)-pinnatisect; segments 4 or 5 pairs, subrhombic or ovate-elliptic, 3–4 × 1.5–2.5 cm, parted; lobules elliptic, linear-lanceolate, or lanceolate, 10–25 × 3–5 mm, obtuse apically; rachis winged. Upper leaves and leaflike bracts pinnatisect or 3–5-lobed. Capitula in broad panicles, many, subglobulous or ovoid, 1–2 mm in diam., nodding. Phyllaries sparsely pubescent. Marginal female florets 5 or 6. Disk florets 6–8, bisexual. Achenes oblong or oblongoid. Fl. and fr. Sep–Dec.

● Forest margins, slopes, scrub; ca. 1600–3000 m. W Guangxi, Guizhou, S Qinghai, Sichuan, E Xizang, Yunnan.

Herbs, perennial, (25–)60–100 cm tall; stems often purplish; most parts pubescent. Lowest leaves 1- or 2-pinnatifid or -sect. Middle stem leaves: petiole 5–10(–15) mm; leaf blade ovate or elliptic-ovate, 4–6 × 2–3 cm, abaxially densely gray or yellowish tomentose, mixed pubescent on veins, adaxially dark green gland-dotted and sparsely pubescent, 1(or 2)-pinnatifid or -sect, rarely -sect; segments 2 or 3 pairs, various, lanceolate, oblong, or elliptic, 10–20 × 5–12 mm, serrate or entire. Uppermost leaves and leaflike bracts elliptic or lanceolate. Synflorescence a narrow panicle, ultimate branches short and dense, often less than 8 mm, with up to 7 capitula. Capitula closely spaced, ± nodding; peduncle to 1.5 mm. Involucre ellipsoid, 1.5–2 mm; phyllaries white with very faint greenish midrib, sparsely pubescent. Marginal female florets 8–10. Disk florets 10–15, bisexual. Achenes oblongoid. Fl. and fr. Sep–Nov.

● Slopes, roadsides; to low middle elevations. Anhui, Fujian, Hebei, Henan, Hubei, Hunan, Jiangsu, S Shaanxi, Shandong, Shanxi, Sichuan, SE Xizang, Yunnan.

北艾 ai hao


Herbs, perennial, 80–150 cm tall, rhizomatous, sparsely arachnoid pubescent, sometimes glabrescent. Basal and lowermost leaves withering before anthesis, shortly petiolate; leaf blade ovate, 3–5(–7) × 2.5–4(–6.5) cm, 2-pinnatisect; segments 3 or 4 pairs; lobules linear-lanceolate or linear, 3–6 × 2–3 mm. Middle stem leaves ± sessile; leaf blade ovate-elliptic, ovate-lobed, 1.5–2.5 × 0.1–0.2 mm, abaxially densely gray or yellowish arachnoid pubescent, glabrescent, margin revolute, apex acute. Uppermost leaves and leaflike bracts 3–5-lobed or entire; lobes of entire bracts lanceolate or linear-lanceolate. Synflorescence a dense, broad panicle. Florets 2–5, bisexual; corolla purplish, ca. 1.5 mm. Achenes obovoid or obovoid-ellipsoid, 1–1.5 mm in diam.; phyllaries sparsely or densely arachnoid pubescent, sometimes glabrescent. Middle stem leaves ± sessile; leaf blade elliptic, ovate-elliptic, 3–5 × 1–1.5 cm, rachis narrowly winged, few serrate or not. Uppermost leaves and leaflike bracts 3-lobed or entire; lobes of entire bracts lanceolate. Synflorescence an ill-defined panicle, lateral branches often shorter than subtending leaves. Involucre oblong, 2.5–3(–3.5) mm; phyllaries densely arachnoid pubescent. Marginal female florets 7–10. Disk florets 8–20, bisexual. Achenes obovoid or ovoid. Fl. and fr. Aug.–Oct. 2n = 16, 16 + 1b, 18, 24, 36, 40, 45, 54.

Roadsides, slopes, canyons, forest margins, forest steppes, subalpine steppes; 1500–3800 m. W Gansu, Qinghai, Shaanxi (Qianning), W Sichuan, Xingjiang, E Xizang [Afghanistan, Japan, Mongolia, Myanmar, Pakistan, Russia, N Thailand, N Vietnam; Africa, SW Asia (Iran), Europe, North America].


北艾 藏北艾 北艾

Herbs, perennial, (45–)60–160 cm tall, sparsely pubescent. Lowermost leaves shortly petiolate; leaf blade 2-pinnatisect. Middle stem leaves ± sessile; leaf blade elliptic, ovate-elliptic, suborbicular, or ovate-elliptic, 3–10(–15) × 1.5–6(–10) cm, abaxially densely gray arachnoid tomentose, adaxially sparsely arachnoid puberulent or glabrescent, 1- or 2-pinnatisect or pinnatipartite; segments 3 or 4 pairs, elliptic-lanceolate or linear-lanceolate, 3–5 × 1–1.5 cm, rachis narrowly winged, few serrate or not. Uppermost leaves and leaflike bracts 3-lobed or entire; lobes of entire bracts lanceolate. Synflorescence an ill-defined panicle, lateral branches often shorter than subtending leaves. Involucre oblong, 2.5–3(–3.5) mm; phyllaries densely arachnoid pubescent. Marginal female florets 7–10. Disk florets 8–20, bisexual. Achenes obovoid or ovoid. Fl. and fr. Aug.–Oct. 2n = 16, 16 + 1b, 18, 24, 36, 40, 45, 54.

Roadsides, slopes, canyons, forest margins, forest steppes, subalpine steppes; 1500–3800 m. W Gansu, Qinghai, Shaanxi, W Sichuan, Xining, E Xizang [Afghanistan, Japan, Mongolia, Myanmar, Pakistan, Russia, N Thailand, N Vietnam; Africa, SW Asia (Iran), Europe, North America].

1a. Plants 100–160 cm tall; middle stem leaves elliptic or ovate-elliptic; capitula in narrow dense panicles .................................. 65a. var. vulgaris

1b. Plants (45–)60–80 cm tall; middle stem leaves suborbicular or ovate-elliptic; capitula in broad panicles .................. 65b. var. xizangensis

65a. Artemisia vulgaris var. vulgaris

北艾 (北艾) 藏北艾 北艾


Plants usually 100–160 cm tall. Middle stem leaves elliptic or ovate-elliptic, 1- or 2-pinnatisect or -sect. Synflorescence a dense, narrow panicle.

Roadsides, slopes, canyons, forest margins, forest steppes, subalpine steppes; 1500–2000 m. W Gansu, Qinghai, Shaanxi (Qianning), W Sichuan, Xingjiang [Afghanistan, Japan, Mongolia, Myanmar, Pakistan, Russia, N Thailand, N Vietnam; Africa, SW Asia (Iran), Europe, North America].


藏北艾 藏北艾 北艾

Artemisia igniaria Maximowicz var. yunnanensis (Jeffrey ex Diels) Pampanini; A. jeffreyana H. Léveillé, nom. illeg. superfl.

Subshrubs, 50–90 cm tall, gray sericeous-pubescent, later sparsely pubescent, much branched. Lower stem leaves: petiole 3–5 cm, base tenmentose; lowermost leaves ovate, 2-pinnatisect or pinnatipartite; segments 2 or 3 pairs, oblong or ovate-elliptic, pinnatifid; lobules 2-paired, oblong, apex obtuse. Middle stem leaves: petiole 1–4 cm; leaf blade ovate or obovate-attenuate, 5–7 × 3–6 cm, abaxially densely gray arachnoid tomentose, adaxially white gland-dotted and incanous pubescent; 1- or 2-pinnatisect or partite; segments 2 or 3 pairs, ovate-elliptic or oblong, 2–4 × 1.5–3.5 cm, apex obtuse and mucronulate. Uppermost leaves and leaflike bracts 3–5-partite or entire; lobes or entire bracts oblong or obovate-oblong. Synflorescence a broad panicle. Capitula solitary or in groups of 2 or 3. Involucre oblong or obovate-ellipsoid, 2–2.5(–3) mm in diam.; phyllaries brown at center, arachnoid pubescent. Marginal female florets 7–13. Disk florets 2–5, bisexual. Achenes ovoid or obovoid. Fl. and fr. Aug.–Oct.

- Dry and hot canyons, shrublands and coniferous forest margins; low elevations to 3700 m. S Qinghai, W Sichuan, Xizang, NW Yunnan.

灰苞蒿 hui bao hao

Subshrubs, (20–)50–120 cm tall, arachnoid pubescent; rootstock horizontally creeping, ca. 1 cm thick. Leaves abaxially densely arachnoid tomentose, adaxially sparsely pubescent and gland-dotted, or glabrescent. Lowermost and middle stem leaves: petiole 1.5–2(–3) cm; leaf blade ovate or oblong-elliptic, 6–10(–18) × 4–6(–10) cm, 2-pinnatisect; segments (2 or)3 or 4 pairs, elliptic or oblong; lateral lobes with 1–3 pairs of lobules; lobules lanceolate or linear-lanceolate, 0.5–1.5 × 2–2.5 mm; rachis narrowly winged. Uppermost leaves and leaflike bracts pinnatisect or 3–5-lobed or entire; lobes or entire bracts linear-lanceolate or lanceolate. Synflorescence a narrow panicle to 25 × 3 cm, sometimes with extra panicles from upper nodes; branches simple, to 4 cm, erect, rather uniform in length; bracts linear, ca. as long as involucre. Capitula solitary or in dense glomerules of 2 or 3, subsessile, erect to ± patent. Involucre ovoid, subglobose or hemispheric, rarely oblong, 2–3 mm in diam.; outer phyllaries purplish tinged, purple or gray arachnoid arachnoid pubescent, scariosa margin broadly hyaline, apex obtuse. Florets 20–38, yellow or purple-brown tinged, all fertile. Marginal female florets 5–7; corolla filiform. Disk florets bisexual 10–20(–30); corolla limb yellow or purple. Achenes brown, obovoid or oblong, ca. 1.25 mm Fl. and fr. Aug–Oct. 2n = 18, 36.

Roadsides, slopes, dry canyons, grasslands, waste areas, terraces; 700–3900 m. S Gansu, Guizhou, W Hebei, Qinghai, S Shaanxi, W Sichuan, Xizang, Yunnan [Afghanistan, N India, Nepal, Pakistan, N Thailand].

1a. Phyllaries gray arachnoid pubescent

67a. var. roxburghiana

1b. Phyllaries purple, sparsely arachnoid pubescent

67b. var. purpurascens

68. Artemisia leucophylla C. B. Clarke, Compos. Ind. 162. 1876.

白叶蒿 bai ye hao


Herbs, perennial, 35–70 cm tall, arachnoid pubescent; rhizome creeping, with short branches from upper parts. Leaves abaxially densely gray arachnoid tomentose, adaxially sparsely arachnoid pubescent and gland-dotted. Lower and middle stem leaves: petiole 1–2 cm; lowermost leaf blades elliptic or ovoid-elliptic in outline, 5–8 × 4–7 cm, 1- or 2-pinnatifid or pinnatisect; segments 3(4 or) pairs, variously rhombic, elliptic, or oblong; lobules minute, 5–10 × 4–5 mm. Middle and upper stem leaves smaller, less divided, blade pinnatisect; segments 2 or 3(4 or) pairs; lobes linear-lanceolate, linear, elliptic-lanceolate, or lanceolate, 10–15 × 2–3 mm. Leaflike bracts 3–5–sect or entire. Synflorescence a dense narrowly conical panicle. Involucre obovoid or ovoid, (2,–)2.5–3.5(–4) mm in diam.; phyllaries greenish or violet, arachnoid pubescent. Marginal female florets 5–8. Disk florets 6–13, bisexual. Achenes obovoid. Fl. and fr. Jul–Oct. 2n = 18.

Slopes, roadsides, forest margins, grasslands, riverbanks, lake-shores; low elevations to 4000 m. Gansu, Guizhou, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Korea, Mongolia, Russia (W Siberia)].


怒江蒿 nu jiang hao


Subshrubs, 10–20 cm tall, gray pubescent. Leaves abaxially densely tomentose, adaxially incanous pubescent. Lower and middle stem leaves: petiole 0.7–1 cm; leaf blade ovate, oblong, or suborbicular, 1–1.5 × 0.8–1 cm, pinnatifid; segments 1 or 2 pairs, elliptic or oblong, 3–4 × ca. 2 mm, 1- or 2-serrate, apex obtuse. Uppermost leaves and leaflike bracts 3-partite or -eleft, or entire; lobes or entire bracts oblong or elliptic. Synflorescence a lax, broad panicle; branches simple racemes to 10 cm, with sterile lower nodes, with leaflike bracts. Capitula up to 10, well spaced, long pedunculate. Involucre ovoid or subglobose, 2.5–2.5 mm in diam.; phyllaries densely arachnoid pubescent. Marginal female florets 7–9. Disk florets 10–14, bisexual. Achenes obovoid. Fl. and fr. Jul–Nov.

- River valleys, brushlands; 2200–2300 m. E Xizang, E Yunnan.

手状蒿 cu jing hao


Subshrubs, 100–130(–200) cm tall, yellowish pubescent. Lower and middle stem leaves: petiole 1–3.5 cm; leaf blade ovate or broadly ovate, 6–22 × 5.5–18 cm, abaxially densely arachnoid pubescent, adaxially sparsely pubescent or glabrescent, gland-dotted, 1( or 2)-pinnatipartite; segments 2 or 3 pairs, elliptic or narrowly elliptic, rarely elliptic-lanceolate, 4–13 × 2–4 cm, rachis winged, 1–5-serrate. Uppermost leaves pinnatipartite; leaflike bracts 3–5-lobed or entire; lobes or entire bracts lanceolate or linear-lanceolate. Synflorescence a broad panicle. Involucre ovoid or ovoid-campanulate, 3.5–5 mm in diam.; phyllaries arachnoid pubescent, glabrescent. Marginal female florets 8–13. Disk florets 13–26, bisexual. Achenes oblong or oblong-ovoid. Fl. and fr. Aug–Oct.

- Alpine steppes, shrublands, waste slopes; 3000–3900 m. S Qinghai, W Sichuan.


蒙古蒿 meng gu hao


- Slopes, shrublands, riverbanks, lakeshores, roadsides, steppes, forest steppes, dry valleys; low elevations to 2000 m. Anhui, N Fujian, Gansu, N Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaooning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xinjiang [Kazakhstan, Korea, Kyrgyzstan, Russia, Turkmenistan, Uzbekistan].


辽东蒿 liao dong hao


Herbs, perennial, 30–70 cm tall, with capitate branches, gray arachnoid tomentose, later loosely tomentose or glabrescent. Lowermost and middle stem leaves: petiole 1–2 cm; leaf blade ovate, suborbicular, or broadly ovate; lowermost blade (1.5–)2–4(–6) × 1.5–4 cm, 1- or 2-pinnatipartite, rarely -sect; segments 2 or 3( or 4) pairs; middle blade 2–5 × 2–4 cm, 2-pinnatisect; segments 3( or 4) pairs; lobules elliptic or elliptic-lanceolate, rarely linear-lanceolate, (3–)5–10 × 1.5–2.5 mm, obtuse apically. Uppermost leaves pinnatisssect; segments 2 pairs; leaflike bracts 3–5-sect. Capitula dense initially, lax later along
Artemisia verbenaecae is used medicinally.


五月艾 wu yue ai

Herbs, perennial, or subshrubs, 80–150 cm tall, much branched, sparsely puberulent or glabrescent. Leaves shortly petiolate or ± sessile; leaf blade abaxially densely gray arachnoid tomentose, adaxially gray or yellowish tomentose or glabrescent. Lowermost leaves ovate or oblong-ovate, 6–12 × 3–8 cm, (1 or)2-pinnatifid; distal lobes larger; segments 3 or 4 pairs, winged at midvein. Middle stem leaves ovate, oblong-ovate, or elliptic, 5–8 × 3–5 cm, (1 or)2-pinnatifid; segments 3( or)4 pairs; distal lobe larger; lobes elliptic-lanceolate, linear-lanceolate, or linear, 10–20 × 3–5 mm; lobules deeply serratate, acute or acuminate apically. Uppermost leaves pinnatifid; leaflike bracts 3-lobed or entire. Capitula sessile or inconspicuously pedunculate, ± erect, remote in broadly conical, almost leafless panicle with obliquely spreading, up to 18 cm long branches. Involucrue ovoid, oblong-ovoid, or broadly ovoid, 3–4 × ca. 2 mm; phyllaries puberulent to glabrous. Florets 15–20, yellowish, all fertile. Marginal female florets 4–10; corolla tubular, ± glandular, 2-toothed. Disk florets 8–12, bisexual, basally glandular. Achenes brown, oblong or obovoid, ca. 1.25 mm. Fl. and fr. Aug–Oct.

Roadsides, forest margins, slopes, shrublands; low elevations to 2000 m. Anhui, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, Hainan, N Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, SE Nei Mongol, Shandong, Shanxi, Sichuan, Xizang, Yunnan, Zhejiang [India, Indonesia, Japan, Korea, Myanmar, Philippines, N Thailand, Vietnam; North and Central America, Oceania].

1a. Branches 10–15(–20) cm; leaves densely arachnoid tomentose, lobules acute apically, midvein narrowly winged .......... 77a. var. indica

1b. Branches 15–25 cm; leaves sparsely arachnoid tomentose or glabrescent abaxially, lobules acuminate or mucronulate apically, midvein winged ...........................................  77b. var. elegantissima

77a. Artemisia indica var. indica

五月艾 wu yue ai (yuán biàn zhòng)


Branches 10–15(–20) cm. Leaves abaxially densely arach-
Roadsides, forest margins, slopes, shrublands; low to middle elevations. Anhui, Fujian, S Guansu, Guangdong, Guangxi, Guizhou, Hainan, S Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Jilin, LE Mongol, S Shanxi, Shandong, Shanxi, Sichuan, Taiwan, SE Xizang, Uunnan, Zhejiang [India, Indonesia, Japan, Korea, Myanmar, Philippines, N Thailand, Vietnam; North and Central America, Oceania].

Material from SE Asia formerly included within Artemisia dubia belongs to A. indica var. indica.

Artemisia indica var. indica is used medicinally; in particular, the root is used for a tonic for the kidneys.


雅致艾 ya zhi ai


Branches 15–25 cm. Leaves abaxially sparsely arachnoid tomentose or glabrescent; lobules acuminate apically, winged at midvein. Capitula in broad panicles.

Slopes; middle to high elevations. SE Xizang [N India].


魁蒿 kui hao


Herbs, perennial, 60–150 cm tall, pubescent, sometimes glabrescent. Leaves densely arachnoid tomentose abaxially. Lowermost leaves long petiolate; leaf blade ovate or elliptic-ovate, 1- or 2-pinnatifid; segments 2 pairs, oblong or oblong-elliptic. Middle stem leaves: petiole 1–2(–3) cm; leaf blade ovate or ovate-elliptic, 6–12 × 4–8 cm, pinnatifid, rarely -sect; segments 2 or 3 pairs, elliptic-lanceolate or elliptic; distal lobe and lobes of lateral lobes larger, obtuse apically. Uppermost leaves pinnatifid; leaflike bracts 3-lobed or entire. Capitula in somewhat broad panicles, oblong or oblong-ovoid, 1.5–2.5 mm in diam. Phyllaries sparsely arachnoid puberulent. Marginal female florets 5–7. Disk florets 4–9, bisexual. Fr. Jul–Nov. 2n = 34.

Roadsides, slopes, shrublands, forest margins, valleys, riverbanks; below 100–1400 m. Anhui, S Guansu, Guangdong, Guangxi, Guizhou, S Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Liaoning, SE LE Mongol, S Shanxi, Shandong, S Shandong, Sichuan, Taiwan, Yunnan [Japan, Korea].

Artemisia princeps is used medicinally.


华西蒿 hua xi hao

Herbs, perennial, 100–150 cm tall; rhizome short, thick; stem often solitary, branches many, 20–30 cm, subglabrous. Lower and middle stem leaves: petiole 2–10 mm; leaf blade elliptic-ovate, 4–9 × 2.5–4 cm, yellow or brown gland-dotted, 1–3-pinnatifid or -sect; segments 4 or 5 pairs; lobes or lobules linear or linear-lanceolate or serrate, 5–25(–35) × 2.5–5 mm, base attenuate, margin revolute, acuminate apically; rachis narrowly winged. Upermost leaves pinnatifid or -sect; leaflike bracts pinnatifid or entire. Synflorescence a broad panicle; ultimate branches with up to 8 capitula. Capitula solitary or in groups of 3 or 4, sessile. Involucrue ellipsoid or oblong-campanulate, 2–3 mm in diam.; phyllaries initially puberulent, glabrescent. Marginal female florets 6–8. Disk florets 10–20, bisexual. Achenes obovoid. Fl. and fr. Aug–Oct.

Slopes, roadsides; middle to high elevations. W Sichuan, Xizang.

1a. Middle stem leaves 1- or 2-pinnatifid; lobules linear or linear-lanceolate, 8–25(–35) × 2.5–3.5 mm, margin entire .......................... 79a. var. occidentalisinensis

1b. Middle stem leaves 2- or 3-pinnatifid; lobules 5–10 × 4–5 mm, margin serrate ........ 79b. var. denticulata

79a. Artemisia occidentalisinensis var. occidentalisinensis 华西蒿(原变种) hua xi hao (yuan bian zhong)

Middle stem leaves 1- or 2-pinnatifid; lobules linear or linear-lanceolate, 8–25(–35) × 2.5–3.5 mm, margin entire.

Slopes, roadsides; middle to high elevations. Xizang.


齿裂华西蒿 chì lie hua xi hao

Middle stem leaves 2- or 3-pinnatifid; lobules lanceolate, 5–10 × 4–5 mm, margin serrate.

Middle to high elevations. W Sichuan, E Xizang.


尖裂叶蒿 jian lie ye hao

Artemisia muristanica Kitamura.

Herbs, perennial, 100–150 cm tall, pubescent, sometimes glabrescent. Lower and middle stem leaves: petiole 3–10 mm; leaf blade ovate or elliptic-ovate, 7–14(–18) × 5–6–10 cm, abaxially densely to sparsely grayish green arachnid pubescent, adaxially green with sparse T-shaped hairs, (1 or)2-pinnatifid to pinnatisect; segments 3–5 pairs, elliptic or oblong, 4–6 × 2–3.5 cm, sharply acute; lobules 3 or 4 pairs, base attenuate, 2- or 3-serrate at margin; rachis winged. Uppermost leaves and leaflike bracts pinnatifid or -cleft. Synflorescence a narrow to broad panicle, 10–25 × 5–10 cm; branches obliquely patent to ascending, up to 25 cm. Capitula ± remote to approximate near branch apices, shortly pedunculate to sessile. Involucrue ellipsoid or ellipsoid-ovoid, 2–3 mm in diam. Marginal

Middle to high elevations. S Xizang [Afghanistan, India, Kashmir, Nepal, N Pakistan].


岐茎蒿 qì jīng hāo

Artemisia princeps Pampanini f. dentata Pampanini; A. princeps f. dissecta Pampanini; A. princeps subf. purpurascens Pampanini;

Subshrubs, 60–120(–150) cm tall, gray tomentose or later sparsely tomentose. Middle stem leaves: petiole 5–15 mm; leaf blade ovate or broadly ovate, 6–12 × 4–10 cm, abaxially densely tomentose, adaxially gray tomentose or glabrescent, 1–or 2-pinnatifid; segments 2 or 3 pairs, elliptic or oblong, 3–5(–6) × 2–3 cm; lobules (2 or)3(or 4) pairs, apex mucronulate. Uppermost leaves 3-partite or entire; leaflike bracts elliptic, entire. Synflorescence a ± broad panicle. Involucre ellipsoid or ovoid, 2.5–3.5 mm in diam.; phyllaries arachnoid pubescent. Uppermost female florets 5–8. Disk florets 7–14, bisexual. Achenes oblong. Fl. and fr. Aug.–Oct. 2n = 18, 36.

Forest margins, roadsides, riverbanks, steppes, meadows, forest steppes, shrublands; low to middle elevations. Hebei, Heilongjiang, Jilin, Liaoning, E Nei Mongol [Korea, Mongolia, Russia].


线叶蒿 xiàn yè hāo


Herbs, perennial, 45–80 cm tall, arachnoid pubescent or glabrescent, with capitate branches. Leaves sessile. Lowermost leaves oblongate-obovate-linear or oblongo-obovate-oblongate, 8–13 × 0.5–0.8 cm, entire or 1- or 2-serrate. Middle stem leaves: blade linear, linear-lanceolate, or falcate, 5–10 × 0.3–0.6 mm, abaxially densely arachnoid tomentose, margin entire or occasionally 1- or 2-serrate, apex obtuse. Uppermost leaves and leaflike bracts linear. Synflorescence a narrow, racemelike panicle. Involucre oblong or ovoid-oblong, 2–3 mm in diam. Marginal female florets 10 or 11. Disk florets 10–15, bisexual. Achenes oblong-obovate or ellipsoid. Fl. and fr. Aug.–Oct.

Humid and semi humid slopes, forest margins, river banks, meadows; low elevations. N Hebei, Heilongjiang, Jilin, Liaoning, E and SE Nei Mongol, N Shanxi [Japan, Korea, E Russia].


高岭蒿 gāo lǐng hāo


Herbs, perennial, 30–70 cm tall, densely gray arachnoid pubescent. Leaves ± sessile. Lowermost leaves ovate-elliptic or ovate-oblong in outline, 2-pinnatipartite. Middle stem leaves: leaf blade elliptic or oblong, 4.5–6.5 × 3.5–4.5 cm, abaxially densely gray tomentose, adaxially sparsely arachnoid pubescent, 1(or 2)-pinnatifid; segments (2 or)3 or 4 pairs, elliptic, 1–1.5 × 0.3–0.5 cm, base attenuate; lobules narrow, 0.5–2(–3) mm wide, occasionally 1- or 2-serrate, apex acuminate. Uppermost leaves and leaflike bracts 3- or 5-partite or entire. Synflorescence a narrow panicle. Involucre subglobose or broadly globose, 2.5–4 mm in diam.; phyllaries arachnoid pubescent. Marginal female florets 4–6. Disk florets 6–10, bisexual. Achenes obvoid or oblong-obovoid. Fl. and fr. Aug.–Oct.

Subalpine meadows, forest steppes, rocky slopes, forest margins, roadsides, shrublands; ca. 1100 m. E Jilin [Korea].


绿苞蒿 lǜ bāo hāo

- Slopes, roadsides; low elevations. S Gansu, Hebei, Shanxi, Sichuan.


林艾蒿  lin ai hao

Artemisia vulgaris Linnaeus var. viridissima Komarov, Fl. Manshur. 3: 673. 1907; A. viridissima var. japonica Pampanini.


Forest margins, roadsides; 1400–1700 m. Jilin, Liaoning [Korea].


波密蒿  bo mi hao

Artemisia lagocephala (Fischer ex Besser) Candolle var. tafelii (Mattfeld) Pampanini.

Herbs, perennial, 40–60 cm tall, sericeous-puberulent, later ± glabrescent. Middle sessile. Lowermost leaves obovate, pinnatifid. Middle stem leaves obovate or obovate-triangular, 7–9 × 4–5 cm, obliquely 3–5-partite from apex to center; segments oblong or elliptic, 20–40 × 5–10 mm, base attenuate, margin 1– or 2-serrate. Uppermost leaves obovate-elliptic, obliquely 3-partite or entire; leaf-like bracts obovate-lanceolate or lanceolate. Synflorescence a lax, broad panicle. Involucre hemispheric or campanulate, 4–5 mm in diam. Marginal female florets 5–10. Disk florets 10–25, bisexual. Achenes obovooid or ovoid. Fl. and fr. Jul.–Oct.

- Shrublands; ca. 3600 m. E Xizang.


山地蒿  shan di hao


Herbs, perennial, 150–200 cm tall, from creeping rhizomes, gray pubescent, glabrescent. Basal leaves withering before anthesis. Middle stem leaves: petiole 2.5–3 cm; leaf blade obvate, 13–19 × 4–12 cm, abaxially gray tomentose, adaxially thinly arachnoid, glabrescent; pinnatifid, segments 2 or 3 pairs, oblong or oblong-lanceolate; distal lobes larger, base attenuate, entire or occasionally few serrate. Uppermost leaves and leaf-like bracts lanceolate, 3-cleft or entire. Synflorescence a large, often rather narrow, panicle, main branches usually ascending; ultimate branches short, second, without bracts. Involute oblong, 2.5–3 mm in diam.; outer phyllaries arachnoid tomentose. Marginal female florets 4–6; corolla apex lacerate. Disk florets 8–14, bisexual. Achene obovooid, 1.5–2 mm. 2n = 51–54.

Roadside, shrublands, forest margins, wet meadows, riverside forests; 300–2800 m. Anhui, Hunan, Jiangxi [Japan, E Russia].

"Artemisia montana" Schlechtendal (Ledebour, Fl. Ross. 2: 591. 1845) is merely a herbarium name cited as a synonym and was therefore not validly published (Vienna Code, Art. 34.1(c)).

90. Artemisia moorcroftiana Wallich ex Candolle, Prodr. 6: 117. 1838.

小球花蒿  xiao qiu hua hao

Artemisia moorcroftiana var. campanulata Pampanini; A. moorcroftiana f. tenuifolia Pampanini.

Subshrubs, 50–70 cm tall; rootstock horizontally creeping, ca. 1 cm thick, woody; stems several, with capitule bracts, most parts sparsely ± arachnoid gray or yellowish pubescent or glabrescent. Lower and middle stem leaves: petiole 1–3 cm; leaf blade oblong, ovate, or elliptic, 5–10 × 2–3(–4.5) cm, abaxially densely gray or yellowish tomentose, adaxially sparsely tomentose, 2–3-pinnatisect or partite; segments (4 or) 5 or 6 pairs, ovate or elliptic-ovate; lobules lanceolate or linear-lanceolate, margin few serrate, apex acuminate; rachis narrowly winged. Uppermost leaves pinnatifid; leaf-like bracts 3–5-partite or entire. Synflorescence a narrowly cylindric interrupted, racemelike panicle, 15–20 × 1.5–2.5 cm; branches 2–3 cm, erect to somewhat appressed spicate. Capitula sessile. Involucre globose or hemispheric, 4–6 mm in diam.; outer phyllaries purplish, sparsely pubescent, margin not hyaline scarious, apex acute. Receptacle ± convex, glabrous. Florets purplish. Marginal female florets 15–20; corolla linear-tubular, glandular, 2-toothed. Disk florets bisexual 30–35; corolla clavate-tubular, base glandular, apex very sparsely hairy. Achene brown, ± cylindric, ca. 1.75 mm. Fl. and fr. Jul.–Oct. 2n = 18.

Slopes, terraces, valleys, rocky hills, subalpine steppes, subalpine meadows; 2000–5300 m. Gansu, Ningxia, Qinghai, W Sichuan, Xizang, NW Yunnan [Bhutan, India, N Pakistan].


阿坝蒿  a ba hao

Herbs, perennial, 100 cm tall or more, gray and yellowish villous and tomentose. Middle stem leaves: petiole 3–5 mm; leaf blade oblong-ovate or elliptic, 6–8 × 3.5–4.5 cm, sparsely arachnoid pubescent and gland-dotted adaxially, densely gray

Herbs, perennial, 15–30 cm tall, white tomentose or glabrous. Lowermost and middle stem leaves: petiole 1–2 cm; leaf blade elliptic, 1.5–3.5 × 1.2–1.8 cm, white tomentose or glabrous, 2-pinnatisect; segments 4 or 5(or 6) pairs, elliptic or elliptic-ovate, 10–15 × 5–10 mm; lobules elliptic or elliptic-lanceolate, (2–)5–8 × 0.5–1.5 mm; rachis narrowly winged. Uppermost leaves and leaflike bracts ovate, 1- or 2-pinnatisect or -partite. Capitula in narrow panicles, campanulate or ovoid, 3–4–(–4.5) mm in diam. Phyllaries brown, white tomentose. Marginal female florets 13–16. Disk florets 20, bisexual. Achene obvoid. Fl. and fr. Jul–Oct.

Rocky, terraces; 3300–5300 m. Hubei, S Qinghai, W Sichuan, E Xizang [N India].

1a. Stem, branches, leaves and phyllaries white tomentose ........................................... 92a. var. tainingensis

1b. Stem, branches, and leaves glabrous, phyllaries sparsely tomentose ................. 92b. var. nitida

92a. Artemisia tainingensis var. tainingensis


Herbs, perennial, 30–40 cm tall, gray puberulent, later glabrescent. Lowermost leaves suborbicular or oblong, 1.5–2 × 1.5 cm, 2- or 3-pinnatisect. Lower and middle stem leaves: petiole 0.4–0.7 cm; leaf blade suborbicular or oblong-ovate, 2–2.5 × 0.5–1.5 cm, 2(or 3)-pinnatisect; segments 4 or 5 pairs, oblong-ovate or elliptic, 5–8 × 4–6 mm; lobules elliptic, 3–4 × 1.5–2 mm; rachis narrowly winged. Uppermost leaves and leaflike bracts sessile, 1- or 2-pinnatisect. Synflorescence a dense, narrow, spikelike panicle. Involucrre ovoid or subglobose, 1.5–2.5 mm in diam.; phyllaries ± glabrous. Marginal female florets 3–5. Disk florets 5–10, bisexual. Achenes ovoid or obvoid. Fl. and fr. Aug–Oct.

Slopes, roadsides; middle elevations. E and SE Xizang.

94. Artemisia campbellii J. D. Hooker & Thomson ex C. B. Clarke, Compos. Ind. 164. 1876.

Subshrubs, 20–35 cm tall, densely yellowish or gray tomentose, foetid. Lower stem leaves: petiole 5–15 mm; leaf blade ovate, 2.5–4 × 1.5–2.5 cm, 2(or 3)-pinnatisect; segments 3–5 pairs, 5–15 × 3–5 mm; lobules lanceolate or linear-lanceolate, 3–5 × 0.5–1 mm. Middle stem and upper leaves sessile; leaf blade ovate, 2.3–3 × 1.5–2.5 cm, abaxially densely gray or yellowish tomentose, adaxially glabrescent, 1- or 2-pinnatisect; segments 3 or 4 pairs; lobules linear or linear-lanceolate. Leaflike bracts 3–5-sector or entire. Synflorescence a dense, narrow panicle. Involucrre hemispheric, 3–4(–5) mm in diam.; phyllaries densely pubescent, margin brown. Marginal female florets 8–10. Disk florets 15–18, bisexual. Achenes oblong or obvoid. Fl. and fr. Jul–Nov.

Dry slopes, shrublands; 3800–5300 m. Qinghai, W Sichuan, E Xizang [Bhutan, India, N Pakistan].


Herbs, perennial, 30–50 cm tall, gray puberulent, capitately branched. Lower and middle stem leaves: petiole 0.5–1.5 cm; leaf blade elliptic or oblong-lanceolate, 3–4 × 1.5–2 cm, abaxially densely gray pubescent, 2- or 3-pinnatisect; segments 5 or 6(or 7) pairs, elliptic; lobules 2 or 3 pairs, elliptic-lanceolate or linear-lanceolate, 3–5 × ca. 1.5 mm, rachis narrowly winged, occasionally few serrate. Uppermost leaves and leaflike bracts elliptic-ovate, 1- or 2-pinnatisect. Synflorescence a dense, narrow panicle. Involucrre hemispheric or ovoid, 3–4 mm in diam.; phyllaries puberulent. Marginal female florets 8–14. Disk florets 10–20, bisexual. Achenes oblong-ovoid or obovoid. Fl. and fr. Aug–Oct.

Slopes, roadsides; middle to high elevations. SE Qinghai, E Xizang.


Herbs, perennial, 30–40 cm tall, sparsely gray or yellowish tomentose. Lowermost and middle stem leaves: petiole 1.5–2...
cm; leaf blade oblong, 2–3 × 1.5–2.5 cm, 2-pinnatisect; segments 4 or 5 pairs; lobules linear-lanceolate, 5–8 × 1.5–2 mm. Uppermost leaves and leaflike bracts (1 or)2-pinnatisect. Capitula in narrow panicles, ovoid, 2–3 mm in diam. Phyllaries sparsely yellowish tomentose. Marginal female florets 3–8. Disk florets 14–18, bisexual. Achene obovoid or oblong. Fl. and fr. Aug.–Oct.

- Slopes; ca. 4200 m. S and SW Xizang.


高山矮蒿 gao shan ai hao

Herbs, perennial, dwarf, caespitose, 8–30 cm tall, gray or yellowish sericeous-pubescent. Lower and middle stem leaves: petiole 1–1.5 cm; leaf blade oblong, elliptic, or oblong-ovate, 1.5–3.5 × 0.5–2 cm, yellowish pubescent, 2- or 3-pinnatisect; segments 4 or 5 (or 6) pairs, elliptic or oblong-ovate, 5–15 × 3–10 mm, pinnatipartite or 3-lobed; lobules elliptic or elliptic-lanceolate; rachis narrowly winged. Uppermost leaves and leaflike bracts 1- or 2-pinnatisect. Synflorescence a narrow panicle. Capitula 2–4, sessile. Involutre hemispheric or subovoid. Achene obovoid. Fl. and fr. Aug.–Oct.

- Alpine steppes, slopes, roadsides; 4000–5000 m. W Sichuan, E Xizang.


东方蒿 dong fang hao


Herbs, perennial, 30–70 cm tall, gray tomentose, later sparsely tomentose. Lowermost leaves: petiole 1–1.5 cm; leaf blade oblong or ovate-elliptic, 2.5–5.5 × 2–3.5 cm, sparsely pubescent adaxially, densely yellowish tomentose and veins pubescent abaxially, 1- or 2-pinnatisect; segments 4 or 5 pairs, distal and upper lobes longer than basal lobes, upper lobes elliptic or oblong, 10–20 × 5–10 mm, lobulate or serrate; lobules 1 or 2 pairs, 3–5 × 1–3 mm. Middle stem leaves ± sessile; leaf blade oblong or obovate-oblong, 3–5.5 × 2–3 cm, pinnatipartite or -subsect; segments 4 or 5 pairs, elliptic or oblong, 5–15(–20) × 3–8 mm; rachis narrowly winged. Uppermost leaves and leaflike bracts 3–7lobed; lobes lanceolate or linear-lanceolate. Capitula in narrow panicles, broadly ovoid or oblong, 3.5–4 mm in diam., sessile. Phyllaries gray or yellowish arachnoid tomentose. Marginal female florets 5–9. Disk florets 8–15, bisexual. Achenes obovoid or ovoid-oblong. Fl. and fr. Jul.–Oct.

- Alpine steppes, alpine meadows, slopes; 3200–4600 m. S Gan-su, E Qinghai, NW Sichuan.


锈苞蒿 xiu bao hao

Herbs, perennial, 70–100 cm tall, sparsely yellowish or rust-colored pubescent or glabrescent. Lowermost leaves sessile; leaf blade ovate or broadly ovate, 2- or 3-pinnatisect. Middle stem leaves: leaf blade ovate or oblong, 5–7 × 4–6 cm, abaxially densely gray tomentose, adaxially sparsely sericeous-pubescent and white glandular punctate, 2(or 3)-pinnatisect; segments 4 or 5 pairs; lobules lanceolate or linear-lanceolate, 10–15 × 1.5–3 mm, rachis narrowly winged, margin revolute, apex acute and mucronulate. Uppermost leaves 1(or 2)-pinnatisect; leaflike bracts pinnatisect, 5-lobed, or entire, latter lanceolate or linear-lanceolate. Synflorescence a somewhat long and broad panicle. Capitula sessile. Involutre hemispheric or subovoid, 3–4(–5) mm in diam.; phyllaries densely rust-colored tomentose. Marginal female florets 8–10. Disk florets 10–30, bisexual. Achenes oblong. Fl. and fr. Aug.–Nov.

- Alpine steppes, forest margins, grasslands; 3400–4700 m. W Hubei, Qinghai, W Sichuan, E Xizang, NW Yunnan.


球花蒿 qiu hua hao

Herbs, perennial, 15–60 cm tall, rhizomatous, often not branched; most parts gray sericeous-pubescent. Basal leaves in dense rosette; petiole 6–7(–15) cm; leaf blade elliptic-ovate or oblong, 7–12 × 5–6 cm, 1- or 2-pinnatipartite; segments (3 or)4–6 pairs; distal and lateral lobes obovate, 2–4 × 1–3 cm, divided; lobules lanceolate or elliptic-lanceolate, rarely ovate-lanceolate, 10–15 × 3–5 mm; basal lobes entire; rachis with 3–4 mm wide wing. Lower and middle stem leaves: petiole 1–3 cm; leaves few, oblong or oblong-elliptic, 2.5–5(–6) × 1.5–3.5(–4) cm, pinnatisect; segments 3 or 4 pairs; lobes lanceolate, linear-lanceolate, or oblanceolate, 10–30(–35) × 2–3 mm. Uppermost leaves and leaflike bracts lanceolate or oblanceolate, 30–50 × 2–4 mm. Synflorescence a simple erect raceme, to 35 cm. Capitula nodding; peduncles 3–10 mm. Involutre hemispheric, 6–10 mm in diam.; phyllaries densely yellowish pubescent. Marginal female florets 10–16. Disk florets 50–60, bisexual; corolla limb purple. Achenes obovoid or oblong. Fl. and fr. Jul.–Oct.

- Alpine steppes, alpine meadows, slopes; 3200–4600 m. S Gan-su, E Qinghai, NW Sichuan.


西南大头蒿 xi nan da tou hao


Herbs, perennial, 60–80 cm tall, puberulent. Lower and middle stem leaves ± sessile; leaf blade ovate or broadly ovate, 7–9 × 4–6 cm, abaxially densely gray arachnoid tomentose, adaxially sericeous-pubescent, 2-pinnatisect; segments 4 or 5 pairs; lobules linear-lanceolate or falcate-lanceolate, 20–40 × 1.5–2.5 mm; rachis narrowly winged. Uppermost leaves pinnatisect or 3–5-lobed; leaflike bracts linear-lanceolate. Synflorescence a narrow panicle. Involutre hemispheric, 5–7 mm in
Leaves: petiole 1.5–2.5 cm; leaf blade oblong-obovate or elliptic-oblong or ovate, 2–5 × 1.5–2.5 cm, abaxially grayish white, persistently sericeous-puberulent, adaxially drying blackish, sparsely sericeous-puberulent, glabrescent, 2-pinnatisect; segments (3 or)4 or 5 pairs, distal lobes or terminals of lateral lobes (2 or)3(or 4)-lobulate; lobules lanceolate or linear-lanceolate, 5–8 × (2–)3–4 mm, acuminate apically. Uppermost leaves and leaflike bracts pinnatisect, 3-sec., or entire. Synflorescence a subterminal, ± narrowly conical panicle to 16 cm; branches few, ascending, to 4 cm; bracts minute. Capitula erect or spreading; peduncle to 5 mm, minutely bracteolate. Involucre broadly ovoid or hemispheric, 3.5–4 mm in diam.; phyllaries white pubescent. Marginal female florets 8–15. Disk florets 18–25, bisexual; corolla with lower part barbate or not. Achenes oblong-ovoid. Fl. and fr. Nov.–Feb.

- Rocky slopes, mountain peaks, limestone crevices on dry ridges; 1500–2000 m. Taiwan.

**104a. Artemisia somae var. somae**

Taiwan狭叶艾 (原变种) tai wan xia ye ai (yuan bian zhong)

Lower part of corolla not barbate.

- Rocky slopes; 1500–2000 m. Taiwan.

**104b. Artemisia somae var. batakensis** (Hayata) Kitamura,

Lower part of corolla barbate.

- Mountain peaks in karst areas, limestone crevices on dry ridges; 1500–2300 m. Taiwan.

**105. Artemisia selengensis** Turczaninow ex Besser, Tent. Abrot. 50. 1832.

藜蒿 lou hao

Herbs, perennial, 60–150 cm tall, strongly aromatic; rhizome elongated, 7–8 mm thick; stem often unbranched. Lower stem leaves usually withered, 8–12 cm overall; petiole 0.5–2(–5) cm; leaf blade broadly ovate or ovate, abaxially densely gray arachnoid tomentose, pbrately or ternately 3–5-sect or -partite, or mixed 7-sect or entire; lobes linear or linear-lanceolate, 5–7(–8) × 0.3–0.5 cm, serrate or not. Middle stem leaves ± sessile; leaf blade palmately or ternately 3–5-lobed or entire; lobes elliptic, elliptic-lanceolate, or linear-lanceolate, 30–50 × 2–4 mm, base attenuate, margin entire or remotely narrowly toothed, apex acuminate. Uppermost leaves and leaflike bracts ternately 2- or 3-lobed or entire. Synflorescence a long, narrow panicle; branches short, erect or only narrowly spreading. Capitula sessile or subsessile. Involucre oblong or broadly ovoid, 2–2.5 mm in diam.; phyllaries sparsely gray arachnoid pubescent, glabrescent. Marginal female florets 8–12. Disk florets 10–15, bisexual. Achenes ovoid, ca. 1.2 mm, brown. Fl. and fr. Jul–Oct. 2n = 16, 36.
Riverbanks, lakeshores, humid areas, meadows, slopes, roadsides; low elevations to 2500 m. Anhui, S Gansu, N Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, S Nei Mongol, S Shaanxi, Shandong, Shanxi, Sichuan, Yunnan [Korea, Mongolia, Russia (E Siberia)].

1a. Margins of leaves or lobes serrulate

................................. 105a. var. selengensis

1b. Leaves or lobes not serrulate, rarely mixed few serrulate

................................. 105b. var. shansiensis

105a. Artemisia selengensis var. selengensis

萎蒿(原变种) lou hao (yuan bian zhong)


Leaf margin serrulate.

Riverbanks, lakeshores, humid areas, meadows, sometimes cultivated; low elevations. Anhui, S Gansu, N Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, S Nei Mongol, S Shaanxi, Shandong, Shanxi, Sichuan, Yunnan [Korea, Mongolia, Russia].

Artemisia selengensis var. selengensis is used for anti-inflammatory and anthelmintic medicines. The rhizome is edible.


山西萎蒿 shan xi lou hao

Leaves or lobes not serrulate, rarely mixed few serrulate.

• Slopes, roadsides; low elevations. Hebei, Henan, Hubei, Hunan, Shandong, Shanxi.


无齿萎蒿 wu chi lou hao

Artemisia keiskeana f. hirtella Nakai; A. keiskeana subf. rotundifolia Pampanini; A. vulgaris linnaeus lusus selengensis Regel.

Subshrubs, 30–100(–120) cm tall, strongly rhizomatous, most parts sparsely puberulent or glabrescent. Lower stem leaves: petiole 2–4(–5) cm; leaf blade ovate, broadly ovate, or oblong, 8–12–(15) × 7–11 cm, abaxially sparsely gray arachnoid tomentose or glabrescent, adaxially glabrescent, 1- or 2-pinnatipartite; segments 2 or 3 pairs, elliptic or oblong, 6–7–(9) × 3–5-mm, 3–5-partite or -cleft, rarely entire; lobules elliptic, elliptic-lanceolate, or ovate-lanceolate, usually serrate. Uppermost leaves pinnatipartite; segments 1 or 2, lanceolate or elliptic-lanceolate, distal one longer, occasionally 1- or 2-serrate; leaflike bracts 3–5-partite or entire. Synflorescence a broad diffusely much-branched, conical panicle; ultimate branches slender and flexuous. Capitula long pedunculate, ± secund, most subtending bracts minute. Involucre dunculate, ± dorel, 3–3.5 mm in diam.; phyllaries glabrous. Marginal female florets 5–6; corolla 0.8–1.1 mm. Achenes ovoid-ellipsoid, ca. 2 mm. Fl. and fr. Aug.–Nov. n = 16, 27.

Roadsides, dry slopes, shrublands, grasslands, forest margins; 100–900 m. Hebei, Heilongjiang, Jilin, Liaoning, Shandong [Japan, Korea, E Russia].


亮蒿 liang hao

Herbs, perennial, 100–150 cm tall. Middle stem leaves ± sessile; leaf blade oblanceolate, 4–9 × 2.5–4 cm, sparsely gray pubescent or glabrescent, 1- or 2-pinnatipartite to subpinnatisect; segments 4 or 5 pairs; lobes or lobules linear or linear-lanceolate, 5–25–(35) × 2.5–3.5 mm, rachis narrowly winged, acuminate apically. Uppermost leaves pinnatifid or pinnatisect; leaflike bracts lobed or entire, latter linear or linear-lanceolate. Synflorescence a conical panicle, relatively small. Capitula crowded at branch tips, subsessile. Involucre ellipsoid or oblong-ovoid, 2–3 mm in diam.; phyllaries pale, sometimes with narrow dark midrib, arachnoid puberulent or glabrescent. Marginal female florets 6–8. Disk florets 10–20, bisexual. Achenes oblong. Fl. and fr. Aug.–Nov.

• River floodlands, waste areas, slopes; 3400–3600 m. S Qinghai, W Sichuan, E Xizang.

This species looks rather similar to Artemisia flaccida.


阴地蒿 yin di hao

Herbs, perennial, 80–130 cm tall, puberulent or glabrescent. Lower and middle stem leaves: petiole 2-4(–5) cm; leaf blade ovate, broadly ovate, or oblong, 8–12–(15) × 7–11 cm, abaxially sparsely gray arachnoid tomentose or glabrescent, adaxially glabrescent, 1- or 2-pinnatipartite; segments 2 or 3 pairs, elliptic or oblong, 6–7(–9) × 1–1.5(–2) cm, 3–5-partite or -cleft, rarely entire; lobules elliptic, elliptic-lanceolate, or ovate-lanceolate, usually serrate. Uppermost leaves pinnatipartite; segments 1 or 2, lanceolate or elliptic-lanceolate, distal one longer, occasionally 1- or 2-serrate; leaflike bracts 3–5-partite or entire. Synflorescence a broad diffusely much-branched, conical panicle; ultimate branches slender and flexuous. Capitula long pedunculate, ± secund, most subtending bracts minute. Involucre subglobose or ovoid, 1.5–2.5 mm in diam.; phyllaries sparsely arachnoid puberulent, sometimes glabrescent, with distinct narrow midrib. Marginal female florets 4–7. Disk florets 8–14, bisexual. Achenes narrowly ovoid or narrowly obvoid. Fl. and fr. Aug.–Oct. n = 16, 27.

Forest margins, shrublands, humid areas, slopes, roadsides; 100–1300 m. Anhui, SE Gansu, Guizhou, Hebei, Heilongjiang, Henan, Hebei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Qinghai, S Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang [Korea, Mongolia, E Russia].
1a. Leaves thinly papery; phyllaries gray arachnoid tomentose, later glabrescent; capitula widely separated along branches ............................................... 108a. var. sylvatica

1b. Leaves thickly papery; phyllaries tomentose; capitula closely spaced along branches ............................................... 108b. var. meridionalis

108a. Artemisia sylvatica var. sylvatica

阴地蒿 (原变种)  yin di hao (yuan bian zhong)


密序阴地蒿  mi xu yin di hao

Leaf blade thickly papery. Capitula closely spaced along branches. Phyllaries gray arachnoid tomentose.

- Slopes, roadsides, shrublands. Henan, Jiangsu, Shanxi.


太白山蒿  tai bai shan hao

Subshrubs or perennial herbs, 80–100 cm tall, gray pubescent. Middle stem leaves: petiole 2–3 cm; leaf blade suborbicular or broadly ovate, 10–14 × 8–12 cm, 2-pinnatisect; segments 4 or 5 pairs, elliptic or oblong, 5–6 × 2–3 cm; lobules (2 or)3 pairs, rachis narrowly winged, 1- or 2-serrate. Uppermost leaves and leaflike bracts 1- or 2-pinnatisect. Synflorescence a broad, much-branched panicle. Involucre ovoid-campanulate or broadly ovoid, 3–3.5(–4) mm in diam.; phyllaries puberulent, sometimes glabrescent. Marginal female florets 5–9. Disk florets 14–22, bisexual. Achenes obvoid. Fl. and fr. Aug–Nov.

- Slopes, forest margins, shrublands; middle to high elevations. S Shaanxi, NE Sichuan.


腺毛蒿组  xian mao hao zu

Herbs, perennial, rarely subshrubs; most parts usually finely arachnoid puberulent to tomentose, also with thick multicellular viscid hairs and/or gland-tipped hairs, and sessile glands. Leaves 1- or 2-pinnatipartite to pinnatisect; lobules 1–8 mm wide. Capitula ovoid or oblounge-ovoid. Phyllary margins scarious, midvein green or sometimes brown. Receptacle glabrous. Marginal florets 2–15; corolla narrowly tubular or rarely narrowly conical, 2- or 3-toothed or without teeth. Disk florets 2–20(–50), bisexual; ovaries well developed; style ca. as long as or longer than corolla, branches divergent, recurved at apex.

Twenty-one species: mainly at middle and high elevations in NW and SW China, a few species in S and SE Asia; 20 species (16 endemic) in China.

Many species contain sesquiterpenoids and some monoterpenoids.

1a. Middle stem leaves with 2–4 pairs of main segments.

2a. Capitula 3–4 mm in diam., in groups of 3–6(–8) on branches of large broad panicles ........................................... 116. A. erlangshanensis

2b. Capitula 1.5–3(–4) mm in diam., uniformly distributed along branches in narrow or broad panicles.

3a. Stem and branches with many sessile blunt multicellular hairs and scattered gland-tipped hairs; middle stem leaves sessile, lobes 3–6(–8) mm wide, revolute, adaxially glandular pubescent and sparsely arachnoid pubescent, abaxial veins with hairs obviously differently colored from those elsewhere ................................................................. 118. A. chingii

3b. Stem and branches sparsely pubescent and glandular pubescent or not; middle stem leaves shortly petiolate, lobes (3–)10 mm wide or more, flat, adaxially uniformly glandular pubescent or on veins only or mixed with non-glandular hairs, abaxial veins with hairs same or different colors as those elsewhere.

4a. Lobes of leaves linear or linear-lanceolate, (1–)1.5–2 × 0.3–1 cm; capitula in broad panicles.

5a. Lobes of leaves linear, 10–15(–30) × 3–6 mm .......................................................... 119. A. simulans

5b. Lobes of leaves linear-lanceolate or elliptic-lanceolate, 15–20 × 5–10 mm ........................................... 125. A. rosthornii

4b. Lobes of leaves elliptic, oblong, or oblong-ovate, more than 2 × 1 cm; capitula in narrower panicles.

6a. Middle stem leaves 3- or ternately 5-partite, distal and lateral lobes subequal, not caudate, entire or few serrate at margin .......................................................... 126. A. sichuanensis

6b. Middle stem leaves 1- or 2-pinnatisect, or -partite, segments 2–4(5) pairs, distal ones longer, or not and then with broadly winged rachis, usually serrate.

7a. Distal lobes not caudate, 2- or 3-cleft, rachis broadly winged.

8a. Leaves papery; capitula oblong or oblong-ovoid, 2.5–3(–4) mm in diam. .................. 124. A. thellungiana

8b. Leaves thickly papery; capitula ovoid, 1.5–2 mm in diam. .................................. 122. A. orientaliyunnanensis
7b. Distal lobes caudate, longer than other lobes, serrate, rachis not winged.
9a. Leaves gland-dotted, segments 2 or 3 pairs, 1- or 2-cleft; capitula oblong or ovoid, 1.5–2(–2.5) mm in diam. ................................................................. 117. *A. atrovirens*
9b. Leaves not gland-dotted, segments 3( or 4) pairs, 2- or 3-lobed or serrate; capitula hemispheric or broadly ovoid, 2.5–3 mm in diam. ......................................................... 127. *A. zayuensis*

1b. Middle stem leaves with 4–6 pairs of main segments.
10a. Capitula (3–)4–5 mm in diam., disk florets 30–40(–50); phyllaries tomentose.
11a. Phyllary margins not barbate; perennial herbs, 40–120 cm tall; stems glandular pubescent .......... 110. *A. viscida*
11b. Phyllary margins barbate; subshrubs, 25–50 cm tall; stems densely yellowish viscid tomentose .......... 111. *A. vexans*
10b. Capitula 1.5–3(–4) mm in diam., disk florets 2–20(–25), if capitula 3–4 mm in diam. then phyllaries glabrous or sparsely puberulent.
12a. Middle stem leaves (2 or)3-pinnatisect or -partite, deeply serrate.
13a. Uppermost flowering branches short, forming narrow panicle; phyllaries barbate at apex; capitula 3–4 mm in diam. ................................................................................ 113. *A. mattfeldii*
13b. Flowering branches long, forming broad, much-branched panicles; phyllaries not barbate; capitula 1–2.5 mm in diam.
14a. Stem, branches, leaves, and phyllaries with prominently gland-tipped hairs; capitula ellipsoid or oblong, 2–2.5 mm in diam. ............................................................. 120. *A. gyitangensis*
14b. Stem, branches, and leaves viscid pubescent, phyllaries glandular pubescent and eglandular pubescent or not; capitula ovoid, 1–1.5 mm in diam. .................................................. 128. *A. gongshanensis*
12b. Middle stem leaves 1- or 2-pinnatisect or -partite.
15a. Capitula 3–4 mm in diam.
16a. Stem and branches sparsely glandular pubescent and densely tomentose, sparsely so later; capitula in narrow panicles ................................................................. 112. *A. tangutica*
16b. Stem and branches densely glandular pubescent, not tomentose; capitula in somewhat broad panicles ................................................................................. 115. *A. viscidissima*
15b. Capitula 1.5–2.5(–3) mm in diam.
17a. Stem and branches densely viscid pubescent; leaves sparsely pubescent adaxially and densely arachnoid tomentose and white gland-dotted abaxially and sparsely glandular pubescent on abaxial veins; capitula in somewhat broad panicles; phyllaries densely tomentose and sparsely glandular pubescent ................................ 129. *A. yadongensis*
17b. Stem and branches densely glandular pubescent and sparsely eglandular puberulent, adaxial surface of leaves and abaxial veins glandular pubescent or also tomentose adaxially; capitula in broad panicles; phyllaries arachnoid tomentose or glabrescent.
18a. Middle stem leaves 1-pinnatisect ................................................................. 123. *A. shennongjiaensis*
18b. Middle stem leaves 2-pinnatisect or -pinnatisect.
19a. Middle stem leaves 2-pinnatisect, distances between segments long, distal lobule longer than laterals, linear or linear-lanceolate, 15–25 × 1.5–2.5 mm .......................................................... 114. *A. occidentalisichuanensis*
19b. Middle stem leaves 2-pinnatisect or nearly -sect, distances between segments shorter, distal lobule subequal to laterals, elliptic-lanceolate or ovate-elliptic, 10–15 × 3–5 mm ........................................ 121. *A. myriantha*


腺毛蒿 xian mao hao

*Artemisia moorcroftiana* Wallch ex Candolle var. *viscida*

Herbs, perennial, 40–120 cm tall, densely glandular pubescent. Lower and middle stem leaves ± sessile; leaf blade elliptic or oblong, 3–4(–7) × 1.5(–2) cm, abaxially gray arachnoid tomentose except on veins, adaxially obviously glandular pubescent, 2-pinnatisect; segments 4 or 5 pairs, elliptic-ovate, 2- or 3-lobed; lobules deeply serrate, 3–4 × 1–1.5(–2) mm, margin revolute, apex acute. Uppermost leaves 1- or 2-pinnatisect; leaflike bracts pinnatisect or 3–5-partite. Synflorescence a dense, narrow panicle. Capitula dense. Involucre broadly ovoid or campanulate, (3–)4–5 mm in diam.; phyllaries densely tomentose. Marginal female florets 8–10. Disk florets 30–40(–50), bisexual. Achenes oblong or obovoid-oblong. Fl. and fr. Aug–Oct.

- Roadsides, slopes; 3000–5000 m. S Gansu, E Qinghai, W Sichuan, E Xizang, NW Yunnan.


藏东蒿 zang dong hao

Subshrubs, 25–50 cm tall, strongly aromatic, densely gray or yellowish viscid tomentose, sparsely glandular pubescent, later laxly viscid tomentose. Lowermost and middle stem leaves
sessile; leaf blade elliptic or oblong, 3–4(–7) × 1–1.5(–2) cm, glandular pubescent on both surfaces, densely arachnoid tomentose abaxially, 2-pinnatisect; segments 4 or 5 pairs, elliptic-ovate; lobules 2 or 3 pairs, 3–4 × 1–1.5(–2) mm, margin revolute, acute apically. Uppermost leaves 1- or 2-pinnatisect; leaflike bracts pinnatisect or 3–5-partite. Capitula in narrow panicles, broadly ovoid or campanulate, (3–)4–5 mm in diam. Phyllaries densely yellowish tomentose, margin barbate. Marginal female florets 8–10. Disk florets 30–40(–50), bisexual. Achene oblong or obovoid-oblong. Fl. and fr. Aug–Oct.

Roadsides, slopes; 3000–5000 m. W Sichuan, E Xizang [Bhutan].


甘青蒿 gan qing hao

Herbs, perennial, 50–90 cm tall, with capitulate branches, densely arachnoid tomentose and sparsely glandular pubescent, later sparsely pubescent basally. Lower and middle stem leaves: petiole 5–20 mm; leaf blade elliptic-ovate or elliptic, 6–10 × 5–8 cm, abaxially glabrescent or densely tomentose, adaxially sparsely glandular pubescent, 2-pinnatisect; segments 4–6 pairs, oblong-ovate or oblong, 2.5–3.5 × 1–2 cm; lobules 2–4 pairs, ovate, elliptic-ovate, or elliptic, 5–10 × 2–4 mm, apex usually acute and mucronulate, sometimes ± rounded; rachis winged. Uppermost leaves pinnatifid; leaflike bracts 3– or 5-partite or entire. Synflorescence a slender ± conical panicle. Involucre oblong or broadly ovoid, 3–4 mm in diam.; phyllaries sparsely glandular pubescent. Marginal female florets 5–7. Disk florets 5–15, bisexual. Achene oblong or oblong-ovoid. Fl. and fr. Jul–Oct.

- Slopes, dunes along riverbanks, grasslands, roadsides; 2700–3800 m. C and SW Gansu, W Hubei, Qinghai, W Sichuan, E Xizang, Yunnan.

1a. Leaves abaxially densely white tomentose ........................................ 112a. var. tangutica

1b. Leaves abaxially densely arachnoid tomentose; phyllaries sparsely puberulent ............................................... 112b. var. tomentosa

112a. Artemisia tangutica var. tangutica

甘青蒿(原变种) gan qing hao (yu an bian zhong)

Leaves abaxially glabrescent; phyllaries ± glabrous ......................... 112a. var. tangutica

1b. Leaves abaxially densely arachnoid tomentose; phyllaries sparsely puberulent ................................................. 112b. var. tomentosa

112b. Artemisia tangutica var. tomentosa

手毛甘青蒿 rong mao gan qing hao

Leaves densely arachnoid tomentose abaxially. Capitula ± densely spaced along branches. Phyllaries sparsely puberulent.

- Grasslands, roadsides; ca. 3200 m. W Sichuan.


粘毛蒿 nian mao hao

Herbs, perennial, 35–50 cm tall, capitately branched, densely glandular pubescent, strongly aromatic. Lowermost and middle stem leaves: petiole 2–3 cm or more; leaf blade oblong or oblong-ovate, 3.5–6 × 1.5–4 cm, abaxially gray or yellowish arachnoid tomentose or glabrous, adaxially and abaxially on veins glandular pubescent. Lowermost leaves (2 or)3-pinnatisect; middle leaves 2( or)3-pinnatisect; segments 5 or 6 pairs, ovate or oblong-ovate, 1.5–2.5 × 1–1.5 cm; lobules lanceolate or deeply serrate, 3–7 × 1–1.5 mm, margin revolute, acute or obtuse apically; rachis winged. Uppermost leaves and leaflike bracts 1- or 2-pinnatisect. Synflorescence a narrow panicle. Involucre oblong or broadly ovoid, 3–4 mm in diam.; phyllaries sparsely glandular pubescent. Marginal female florets 5–7. Disk florets 8–15, bisexual. Achene obovoid or oblong. Fl. and fr. Jul–Oct.

- Forest margins, grasslands, slopes; 2600–4800 m. SW Gansu, NW Guizhou, W Hubei, S Qinghai, W Sichuan, E Xizang, W Yunnan.

1a. Leaves abaxially densely white tomentose ........................................ 113a. var. mattfeldii

1b. Leaves abaxially glabrous .............. 113b. var. etomentosa

113a. Artemisia mattfeldii var. mattfeldii

粘毛蒿(原变种) nian mao hao (yu an bian zhong)

Leaves abaxially densely white tomentose.

- Forest margins, grasslands, slopes; 2600–4800 m. SW Gansu, S Qinghai, W Sichuan, E Xizang.


无绒粘毛蒿 wu rong nian mao hao

Leaves abaxially glabrous.

- Slopes; 3600–4200 m. SW Gansu, S Qinghai, W Sichuan, E Xizang.


川西腺毛蒿 chuan xi xian mao hao

Herbs, perennial, 150 cm tall or more, much branched, densely glandular pubescent. Lower and middle stem leaves: petiole 5–15 mm; leaf blade oblong or elliptic, 4–8(–9) × 3–4.5 cm, abaxially gray arachnoid pubescent, glandular pubescent on veins, adaxially glandular pubescent, 2-pinnatisect; segments 4 or 5 pairs; lobules 1 or 2 pairs, distal lobules longer, linear or linear-lanceolate, 15–25 × 1.5–2.5 mm; rachis winged. Uppermost leaves and leaflike bracts 1- or 2-pinnatisect, 3-lobed, or entire. Synflorescence a broad, much-branched panicle. Involucre oblong-ovoid or oblong-campanulate, 1.5–2.5 mm in diam.; phyllaries sparsely puberulent or ± glabrous. Marginal

- Slopes, roadsides; middle to high elevations. W Sichuan.


密腺毛蒿

Subshrubs, 70–80 cm tall, yellowish or gray glandular pubescent. Middle stem leaves ± sessile; leaf blade elliptic-ovate or ovate, 7–8 × 6–7 cm, both surfaces gray pubescent, adaxially and veins abaxially glandular pubescent, 2-pinnatisect; segments 4 or 5 pairs, distal lobes longer than others, elliptic or ovate-elliptic; lobules elliptic or elliptic-lanceolate, 8–12 × 4–6 mm, rachis narrowly winged, apex acuminate. Uppermost leaves and leaflike bracts pinnatifid or 3-lobed. Synflorescence a moderately broad, simple panicle, branches racemelike, to ca. 5 cm. Capitula slightly irregularly spaced, sessile. Involute broadly ovoid or ovoid-campanulose, often shorter than subtending bracteole, 3–3.5 mm; phyllaries brown pubescent. Marginal female florets 5–10. Disk florets 10–15, bisexual. Achenes oblong or ellipsoid. Fl. and fr. Aug–Oct.

- Forest margins. E Xizang.


二郎山蒿

Subshrubs, 50–130(–150) cm tall, densely viscid tomentose and glandular pubescent. Lower and middle stem leaves: petiolo 2–3 cm or more; leaf blade suborbicular, broadly ovate, or ovate, 6–12 × 4–10 cm, abaxially arachnoid tomentose, including veins, adaxially sparsely gland-dotted and puberulent, 1(or 2)-pinnatifid; segments 2 or 3 pairs, elliptic or elliptic-lanceolate, 30–70 × 8–20 mm, margin usually 1- or 2-serrate. Uppermost leaves and leaflike bracts 3–5-lobed. Synflorescence a broad panicle. Capitula in clusters of 3–6(along branches. Involute hemispheric, subglobose, or broadly ovoid, 3–4 mm in diam.; phyllaries yellowish puberulent. Marginal female florets 5–8. Disk florets 15–25, bisexual. Achenes obvoid or oblong. Fl. and fr. Aug–Oct.

- Roadsides, slopes, ridges, canyons; 2300–3100 m. W Sichuan.


南毛蒿

Herbs, perennial, 80–100(–140) cm tall, stems sparsely glandular but densely viscid, pubescent. Lower stem leaves: petiole 5–15 mm; leaf blade ovate or broadly ovate, 5–6 × 4–5 mm, 1(or 2)-pinnatifid to nearly -sect; segments 2 or 3, elliptic, lobes 3–6(–8) mm wide, margin revolute, occasionally with 2 or 3 serrations. Middle stem leaves ± sessile; leaf blade ovate, ovate-elliptic, or broadly ovate, 3.5–5 × 2–4 cm, abaxially densely arachnoid tomentose with underlayer of sessile glands and coarser blunt hairs on veins, adaxially papillate-pubescent, sometimes glabrescent, glandular pubescent, pinnatifid; segments 2 or 3 pairs, elliptic or elliptic-lanceolate, 10–20 × 3–6(–8) mm. Uppermost leaves and leaflike bracts 3–5-partite or entire, lobes ± linear. Synflorescence a narrow conical panicle. Involute ovoid or oblong, 1.5–2 mm in diam.; phyllaries with green midrib, densely arachnoid pubescent to glabrescent. Marginal female florets 3–5. Disk florets 8–12, bisexual. Achenes obvoid or ovoid. Fl. and fr. Aug–Oct.

- Slopes, grasslands, roadsides; low to middle elevations. Anhui, S Gansu, Guangdong, Guangxi, Guizhou, S Henan, Hubei, Hunan, Jiangxi, S Shaanxi, S Shanxi, Sichuan, Tianan, Taiwan, Yunnan, W Zhejiang.


中南蒿

Herbs, perennial, 60–100(–150) cm, apparently rhizomatous, glandular pubescent and deciduous puberulent. Lowermost leaves shortly petiolate; leaf blade ovate or broadly ovate, 5–10 × 4–10 cm, 1- or 2-pinnatifid, segments 2 or 3 pairs, distal lobes longer than lateral lobes. Middle stem leaves: petiole 1–2 cm; leaf blade ovate or ovate-elliptic, (5–)5–8 × (3–)4–7 cm, abaxially densely grayish white tomentose, veins with sparser thick multicellular hairs, adaxially dark green, sericeous-puberulent, sometimes glabrescent, glandular punctuate, pinnatifid; segments 2 or 3 pairs, elliptic or obovate-elliptic, 15–25 × (5–)10–15 mm, margin 1- or 2-toothed, apex acute and mucronulate. Uppermost leaves and leaflike bracts pinnatifid, 3-lobed, or entire. Synflorescence a conical panicle; lower branches ± cylindric, ultimate branches secund; bracts linear, shorter than involucre. Capitula ± contiguous, subsessile, erect. Involute oblong or ovoid, 1.5–2 × (2)–2.5 mm in diam.; phyllaries with green midrib, sparsely arachnoid pubescent. Marginal female florets 3–6. Disk florets 5–8, bisexual. Achenes obvoid. Fl. and fr. Aug–Oct.

- Slopes, roadsides; middle to high elevations. W Sichuan.
121. Artemisia myriantha Wallich ex Besser, Tent. Abrot. 51. 1832.

多花蒿 duo hua hao

Herbs, perennial, 70–120(–150) cm tall, glandular and eglandular pubescent. Lower and middle stem leaves: petiole 5–20 mm; leaf blade ovate or elliptic, (5–)7–12–(19) × 6–10 cm, abaxially gray arachnoid tomentose, sometimes glabrescent, glandular pubescent on veins, adaxially densely glandular pubescent, 1- or 2-pinnatipartite or subpinnatisect; segments 4 or 5(or 6) pairs, elliptic or ovate-elliptic, 2.5–5(–6) × (1–)1.5–2.5(–3) cm; lobules 2 or 3 pairs, elliptic-lanceolate or ovate-elliptic, 10–15(–20) × 3–5 mm, occasionally with 1 or 2 serrations, apex mucronulate; rachis winged. Uppermost leaves pinnatipartite; segments 3 or 4 pairs; leaflike bracts 3–5-lobed or entire. Synflorescence a broad, much-branched panicle. Involucre broadly ovoid, 1.5–2 mm in diam.; phyllaries sparsely arachnoid puberulent or glabrescent. Marginal female florets 3–5. Disk florets 4–6, bisexual. Achenes obovoid or oblong. Fl. and fr. Aug–Oct.

- Dry shrublands, slopes, forest margins; 3100–3800 m. W Sichuan, E Xizang.


白毛多花蒿 bai mao duo hua hao


Leaves densely gray arachnoid tomentose abaxially. Phyllaries sparsely arachnoid puberulent.

- Slopes, roadsides, cultivated fields, thickets, forests, rocky riverbanks; 800–2800 m. Guizhou, Qinghai, Sichuan, Xizang, Yunnan [Bhutan, N India, Nepal].


滇东蒿 dian dong hao


- Slopes, roadsides; 1500–2700 m. E Yunnan.

Slopes, roadsides; 1200–3000 m. SE Xizang, Yunnan [Bhutan, N India].


川南蒿 chuan nan hao


● Forest margins, roadsides; low to middle elevations. S Sichuan.


四川艾 si chuan ai


● Forest margins, roadsides; 2600–3300 m. Xizang, W Yunnan.

1a. Leaves 1- or 2-pinnatifid, lobes 2–2.5 cm wide, deeply serrate; corolla limb puberulent .......................... 127a. var. yauensis
1b. Leaves 2-pinnatifid or leaves basally pinnatisect, lobes 1–1.5 cm wide, cleft, lobules few serrate; corolla limb glabrous ........... 127b. var. pienmaensis


察隅蒿 cha yu hao

Leaf blade 1- or 2-pinnatifid; lobes 2–2.5 cm wide, deeply serrate. Corolla limb puberulent.

● Forest margins; ca. 3100 m. Xizang (Zayü).


片马蒿 pian ma hao

Leaf blade 2-pinnatifid to 2-pinnatisect, basal part more deeply divided; lobes 1–1.5 cm wide, irregularly deeply serrate to pinnatiform; lobules few serrate. Corolla limb glabrous.

● Forest margins, roadsides; 2600–3300 m. W Yunnan.


贡山蒿 gong shan hao

Herbs, perennial, 150–180 cm tall, sparsely pubescent and tomentose. Lower and middle stem leaves: petiole 3–4 cm; leaf
Herbs, perennial or nearly subshrubs, 50–70 cm tall, gray


亚东蒿 ya dong hao
Herbs, perennial, without glandular or viscid hairs (sessile glands often present). Leaves 1 or 2(or 3)-pinnatisect, rarely irregularly shallowly lobed or 3-cleft at apex. Capitula with bracts absent or minute and basal. Phyllaries ± uniformly membranous, white or yellowish, glabrous. Receptacle glabrous. Marginal florets 6–12. Disk florets 3–10(–23), bisexual; ovaries well developed; style ca. as long as or longer than corolla, branches divergent, recurved at apex.

Six species: E, S, and SE Asia; five species (four endemic) in China.

Many species contain sesquiterpenoids and some monoterpenoids.

1a. Leaf blade entire, rarely 2- or 3-cleft at apex, margin shallowly serrate ................................................................. 134. A. anomala
1b. Leaf blade pinnately divided, margin more deeply serrate or lacerate.

2a. Middle stem leaves 1–3-pinnatipartite or -sect, segments 2(or 3) pairs, uppermost leaves 3-partite, margin serrate .......................................................................................................................................................... 130. A. deversa
2b. Middle stem leaves 1–3-pinnatipartite or pinnatisect, segments 3–5 pairs, uppermost leaves not 3-partite, margin irregularly serrate.

3a. Middle stem leaves sessile, lobules lanceolate, elliptic-lanceolate, or linear-lanceolate, rarely falcate-lanceolate, entire or few serrate; involucre 2.5–3.5(–4) mm in diam. disk florets 10–23 .............................................. 133. A. flaccida
3b. Middle stem leaves petiolate, 1–3-pinnatipartite or -sect, segments irregularly serrate or lacerate; involucre 1–2.5(–3) mm in diam. disk florets 3–10.

4a. Middle stem leaves 1 or 2(or 3)-pinnatipartite or pinnatisect, segments 3 or 4(or 5) pairs, margin lacerate; involucre 1.5–2.5(–3) mm in diam.; marginal female florets 4–10 ................................................................. 131. A. lactiflora
4b. Middle stem leaves 2- or 3-pinnatatisect, segments 4 or 5 pairs, margin regularly serrate; involucre 1–1.5 mm in diam.; marginal female florets 2–4 ................................................................. 132. A. emeiensis


亚东蒿 ya dong hao
Herbs, perennial, 50–100 cm tall, branched apically; all parts glabrous. Middle stem leaves: petiole 2–4 cm; leaf blade ovate or broadly ovate, 8–14(–18) × 4–12 cm, pinnatipartite or -cleft; segments 2(or 3) pairs, ovate, ovate-elliptic, or ovate-lanceolate, 2.5–8 × 1–5 cm, margin lacerate and serrate, apex acuminate. Uppermost leaves dichotomously (2 or)3-partite, or entire; entire leaves elliptic or elliptic-lanceolate; distal lobes 4–8 × 2–5 cm, base attenuate, margin serrate; leaflike bracts entire or occasionally 1- or 2-partite or cleft. Synflorescence a moderately broad panicle, branches ± divaricate; ultimate branches slender, lax, sometimes several per node; bracts mostly absent. Capitula widely spaced, sessile. Involucre oblong or ellipsoid, 1.5–2.5 mm in diam. Marginal female florets 3–5. Disk florets 4–9, bisexual. Achenes oblong or obovoid-oblong. Fl. and fr. Aug–Oct.

Forest margins, canyons, slopes, riverbanks; 1000–2300 m. SE Gansu, W Hubei, S Shaanxi, NE Sichuan.

131. Artemisia lactiflora Wältl. ex Candolle, Prodr. 6: 115. 1838.

白苞蒿 bai bao hao
Herbs, perennial, 50–150(–200) cm tall, all parts glabrous. Lower and middle stem leaves: petiole 2–5 cm or more; leaf blade ovate or ovate-elliptic, 5.5–12.5(–31) × 4.5–8.5(–15) cm, 1 or 2(or 3)-pinnatisect, rarely parted; segments 3 or 4(or 5) pairs, very variable, ovate, ovate-elliptic, obovate, or elliptic; basal and lateral lobes larger than distal lobes, 2–8 × 1–3 cm, margin irregularly serrate, apex rounded to acuminate. Upper-
most leaves and leaflike bracts 1- or 2-pinnatisect or -sect, margin serrate. Synflorescence a ± narrow conical panicle, often with extra panicles from upper nodes to form broad, conical, compound panicle; branches obliquely ascending; ultimate branches to 4 cm; bracts mostly absent. Capitula closely spaced, sessile. Involucre oblong, 1.5–2.5(–3) mm in diam. Marginal female florets 4–10. Disk florets 4–10, bisexual. Achenes obovoid or obovoid-oblong. Fl. and fr. Aug.–Oct. 2n = 16, 18.

Forest margins, shrublands, canyons, slopes, roadbanks, riverbanks; low elevations to 3000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Cambodia, N India, Indonesia, Laos, Singapore, N Thailand].

1a. Leaves ca. 31 × 15 cm, pinnatisect; leaflike bracts triangular. ........................................... 131c. var. taibaishanensis

1b. Leaves 5.5–12.5(–14.5) × 4.5–8.5(–12) cm, 1- or 2(or 3)-pinnatisect or -partite; leaflike bracts pinnatisect or pinnatisect.

2a. Middle stem leaves 1- or 2-pinnatisect or -partite, uppermmost leaves pinnatisect or pinnatisect. ........................................... 131a. var. lactiflora

2b. Middle stem leaves 2(or 3)-pinnatisect, uppermmost leaves 1- or 2-pinnatisect or -sect. ........................................... 131b. var. incisa

131a. Artemisia lactiflora var. lactiflora

131b. Artemisia lactiflora var. incisa


Middle stem leaf blades 1- or 2-pinnatisect or -partite. Uppermost leaf blades pinnatisect or -sect.

Forest margins, shrublands, canyons; low elevations to 3000 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Cambodia, N India, Indonesia, Laos, Singapore, N Thailand].

Artemisia lactiflora var. lactiflora is used in anti-inflammatory medicines and is also cultivated as a culinary herb.


Artemisia lactiflora

Artemisia incisa


Middle stem leaf blades 2(or 3)-pinnatisect or -partite. Uppermost leaf blades 1- or 2-pinnatisect or -sect.

Herbs, perennial, 30–75 cm tall, puberulent or glabrescent. Lowermost and middle stem leaves shortly petiolate or ± sessile; leaf blade ovate-oblong or ovate, 7–15 × 5–10 cm. Lower leaves 3-pinnatisect; middle leaves 2- or 3-pinnatisect; segments 4 or 5 pairs, ovate-oblong or oblong, 3–6 × 2–3 cm; lobules 2 or 3 pairs, lacerate; rachis narrowly winged. Uppermost leaves and leaflike bracts 1- or 2-pinnatisect or -partite. Capitula in somewhat broad panicles. Involucre ovoid, 1–1.5 mm in diam. Marginal female florets 2–4. Disk florets 3–8, bisexual. Achenes obovoid. Fl. and fr. Aug.–Nov.

Forest margins, forest shrublands; 2500–2800 m. C Sichuan.

133. Artemisia flaccida

Artemisia flaccida

Artemisia incisa

Artemisia lactiflora f. incisa

Artemisia lactiflora f. henryana

Artemisia lactiflora f. septemlobata

Artemisia lactiflora

Artemisia lactiflora f. incisa

Artemisia lactiflora f. henryana

Artemisia lactiflora f. septemlobata

Artemisia lactiflora

Artemisia lactiflora
endemic) in China.

to very lax.

- Grasslands, hills, roadsides; 1000–4100 m. W Guizhou, Sichuan, Yunnan.


**奇蒿 (yuan bian zhong)**

Herbs, perennial, 80–150 cm tall, puberulent or glabrescent. Lower and middle stem leaves thickly papery; petiole 2–5 mm; leaf blade ovate, ovate-elliptic, elliptic-lanceolate, or lanceolate, 9–22 × 2.5–4(–5.5) cm, abaxially gray tomentose or glabrescent, adaxially drying dark, glabrescent, dentate or 1- or 2-toothed, apices acuminate. Synflorescence relatively dense.

- Roadsides, forest margins, forests; low to middle elevations. C and E Sichuan.

**134a. Artemisia anomal a** var. *anomala* (Y. R. Ling) S. Moore, J. Bot. 13: 227. 1875

**密毛奇蒿 (mi mao qi hao)**

Leaf blades ovate, ovate-elliptic, or ovate-lanceolate, 9–12 cm, abaxially glabrescent.


**密毛奇蒿 (mi mao qi hao)**

Leaf blades ovate, ovate-elliptic, or ovate-lanceolate, 9–12 cm, abaxially gray or yellowish tomentose.


Shrubs, shrublets, or herbs, perennial, annual, or biennial, puberulent or pubescent, often glabrescent, rarely tomentose, without glandular or viscid hairs (sessile glands often present). Leaves 1- or 2-pinnatisect, less often subpalmately 5–7-partite or entire; lobules 0.3–1.5(–2.5) mm wide, or pectinate, less than 1.5 × 1.5 mm. Capitula globose to ovoid. Phyllary margins scarious. Receptacle glabrous. Marginal florets 2–20(–29); corolla tubular or narrowly conical, often slightly enlarged at base, 2- or 3-toothed. Disk florets 3–20(–35), male; ovaries minute, rarely absent; style shorter than corolla, 2- or 3-cleft, lobes usually not divergent, apex clavate or funnelform.

About 80 species: N Hemisphere, mainly in arid areas, a few species in N Africa, Central America, and N South America; 35 species (17 endemic) in China.

Many species contain aromatic compounds and some sesquiterpenoids and/or limited monoterprenoids.

1a. Leaf blades abaxially glabrescent

1b. Leaf blades abaxially gray or yellowish tomentose

**134a. Artemisia anomal a** var. *anomala* (Y. R. Ling) S. Moore, J. Bot. 13: 227. 1875

- Forest margins, roadsides, canyons, riverbanks, shrublands, slopes; 200–1200 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, E Sichuan, Taiwan, Zhejiang.

1a. Leaves entire, linear, linear-lanceolate, elliptic-lanceolate, or lanceolate, occasionally some with 1(or 2) lateral lobes or apex 3-cleft

1b. Leaves 1–3(or 4)-pinnatisect, lobules narrowly linear.

2a. Capitula 2.5–3–6 mm in diam., or if 2.5–3 mm in diam. then plants shrubs or shrublets, middle stem leaf lobules stiff, 1.5–3 mm wide.

2b. Capitula 5–6 mm in diam.

3a. Plants more than 60 cm tall; involucres (3–)4–6 mm in diam., if less than 4 mm then involucres ovoid, lobules of middle stem leaves filiform or linear, 20–30 × 1.5–2.5 mm, or lobules falcate.

3b. Subshrubs, shortly capitulate branched; lowermost and middle stem leaves less than 1 cm wide, pinnatisect, segments 1 or 2 pairs; capitula in spicate-racemose or narrow panicles.
4b. Shrubs, much branched; middle stem leaves (1 or)2-pinnatisect, segments 2 or 3 pairs, or 4 pairs and then leaves ovate or broadly ovate, more than 1 cm wide; capitula in broad or narrow panicles; capitula (2.5–)3–5 mm in diam.

5a. Capitula ovoid, erect, in broad and branched or somewhat broad panicles; stem purple; lower leaves with 3–5 pairs of segments, middle leaves with (2 or)3 or 4 pairs of segments .................................................................................................................................... 138. A. halodendron

5b. Capitula globose or subglobose, nodding, in broad or narrow panicles; stem gray, brown or yellowish; lower leaves with 2–4 pairs of segments, middle leaves with 2 or 3(or 4) pairs.

6a. Middle stem leaves (5–)6–8 × 3–4 cm, segments 2 or 3(or 4) pairs, lobules narrowly linear, straight; capitula in narrow or somewhat broad panicles; stem gray .............................................. 137. A. wudanica

6b. Middle stem leaves 2–5–(8) × 1.5–3–(4) cm, segments (1 or)2 or 3 pairs, lobules linear or falcate; capitula in lax and broad panicles; stem yellowish .................................................. 136. A. sphaerocephala

3b. Plants to 20–50(–60) cm tall; capitula (2.5–)3(–4) mm in diam., or if more than 4 mm then capitula globose and lobules in middle stem leaves linear to filiform, 5–10 × 0.5–1 mm, or leaves palmately 5–7-partite.

7a. Stem unbranched or few and shortly capitate branched, pubescent; leaves palmately 5–7-partite, sericeous-pubescent on both surfaces; capitula in narrow panicles; phyllaries pubescent ..................................................................................................................................... 155. A. kuschakewiczii

7b. Stem branched, pubescent or glabrescent; leaves 1 or 2(or 3)-pinnatisect; capitula in broad or narrow panicles; phyllaries pubescent or glabrescent.

8a. Lowermost and middle stem leaves 2(or 3)-pinnatisect, lobules 0.5–0.8 mm wide; capitula hemispheric, pedunculate, in narrow racemelike panicles .......................................................... 165. A. oligocarpa

8b. Lowermost and middle stem leaves 1- or 2-pinnatisect, lobules 1–2.5 mm wide; capitula not hemispheric, if pedunculate then leaf lobes falcate; capitula in broad or narrow panicles.

9a. Stem less than 30 cm tall; leaflike bracts 2–3 × capitula and longer than fertile branches; synflorescence a narrow panicle.

10a. Middle stem leaves 1–2 × 0.5–1.5 cm, pinnatisect, midvein flat .............................................. 150. A. wellbyi

10b. Middle stem leaves 3.5–4.5 × 2–3 cm, 2-pinnatisect, midvein abaxially prominent, white ............................................................................................................. 152. A. gyangzeensis

9b. Stem 30–60 cm tall; leaflike bracts longer than capitula but shorter than fertile branches; synflorescence a broad panicle.

11a. Lateral lobes of middle stem leaves linear, linear-lanceolate, or falcate-lanceolate, 1.5–2.5 mm wide ..................................................................................................................................... 151. A. waltonii

11b. Lateral lobes of middle stem leaves narrowly linear or filiform, straight, 1–1.5 mm wide ..................................................................................................................................... 142. A. prattii

2b. Capitula 1–2.5–(3) in diam.; middle stem leaf lobules narrowly linear or filiform, 0.5–1.5(–2) mm wide; or if capitula 2–2.5–(3) mm in diam. then plants herbaceous, lobules of leaves thin, 0.5–1 mm wide.

12a. Shrubs or caespitose subshrubs, with strong woody stock; lobules of middle stem leaves narrowly linear or filiform, 0.5–1.5(–2) mm wide; growing in arid areas.

13a. Lower branches more than 12 cm, upper branches more than 5 cm; capitula in broad panicles.

14a. Petiole in middle stem leaves 2–3(–4.5) cm; capitula subglobose ................................................... 143. A. klementzae

14b. Leaves sessile or petioles less than 1.5 cm in middle stem leaves; capitula ovoid or ovoid-ellipsoid.

15a. Middle stem leaves pinnatisect, lobes 0.5–1 mm, rarely mixed 1- or 2-lobuled at basal or middle lobes ..................................................................................................................................... 141. A. oridisca

15b. Middle stem leaves (1 or)2-pinnatisect, 3-lobuled at basal and middle lobes, lobes or lobules 1.5–2 mm.

16a. Branches many, nearly horizontal; lobule apex obtuse, mucronulate ......................... 140. A. songarica

16b. Branches ascending; lobule apex acute.

17a. Bark usually deciduous; lobules 15–20 × 1.5–2 mm .................................................... 146. A. oxycephala

17b. Bark persistent; lobules 4–10 × (0.5–)1–1.5 mm .................................................. 147. A. campestris

13b. Lower branches 4–10 cm, upper branches 3–5 cm; capitula in narrow or somewhat broad panicles.

18a. Lower and middle stem leaves pinnatisect, segments of lowermost leaves 2 or 3 pairs, segments of middle leaves 1 or 2 pairs.

19a. Ultimate lobules of leaves 1.5–2.5 mm wide; involucre 2–2.5 mm in diam. ................ 145. A. xanthochroa

19b. Ultimate lobules of leaves 0.5–1.5 mm; involucre 2–2.5–(3) mm in diam.
20a. Involucre semi-globose or subglobose, 2.5–(3) mm in diam.; disk florets 5–10 ................................................................. 154. *A. nortonii*

20b. Involucre ovoid-oblong or ellipsoid, 2–2.5 mm in diam.; disk florets 4–6 ................................................................. 149. *A. saposhnikovii*

18b. Lowermost and middle stem leaves 2(or 3)-pinnatisect, segments of lowermost leaves 4 or 5 pairs.

21a. Middle stem leaf segments 3 or 4(or 5) pairs; synflorescence a broad, conical panicle ................................................................. 148. *A. marschalliana*

21b. Middle stem leaf segments 2 or 3 pairs; synflorescence a narrow, cylindrical panicle.

22a. Lowermost and middle stem leaves 1.5–2.5 × 1–1.5 cm, lowermost 1- or 2-pinnatisect, segments 2–5 pairs; capitula 1.5–2.5 mm in diam., in narrow panicles ................................................................. 153. *A. sigazeensis*

22b. Lowermost and middle stem leaves less than 1 × 1 cm, 2-pinnatisect, segments 2 pairs; capitula 1–1.5 mm in diam., in somewhat broad or narrow panicles ................................................................. 144. *A. globosoides*

12b. Perennial, annual, or biennial herbs, root solitary, or nearly subshrubs but not caespitose and lobules of leaves thin and soft, other lobules narrowly linear, filiform, or linear-lanceolate, less than 1 mm wide; not growing in arid areas.

23a. Annual, biennial, or perennial herbs, root solitary, narrowly fusiform; lobules of middle stem leaves soft and thin, narrowly linear-filiform or narrowly linear-lanceolate, 0.2–0.5(–1) mm wide.

24a. Segments of middle stem leaves 5–8 pairs; phyllaries gray puberulent .............................. 169. *A. blepharolepis*

24b. Segments of middle stem leaves (1 or)2–4 pairs; phyllaries often glabrous or glabrescent.

25a. Middle stem leaves 2-pinnatisect, segments (3 or)4 pairs; capitula densely spicate on branches and in narrow or somewhat broad panicles .............................................. 167. *A. stricta*

25b. Middle stem leaves 1- or 2-pinnatisect, segments (1 or)2 or 3 pairs; capitula spreading on branches and in broad panicle or spicate-panicles.

26a. Plants less than 20 cm tall, branched from base of stem, and usually procumbent; middle stem leaves pinnatisect; capitula in spicate panicles ............. 160. *A. demissa*

26b. Plants more than 20 cm tall, branched from middle or basally on stem; middle stem leaves 2-pinnatisect; capitula in broad panicles.

27a. Middle stem leaves gray or yellowish sericeous-pubescent, later glabrescent; capitula 1.5–2 mm in diam., sessile or shortly pedunculate, in broad panicles ................................................................. 166. *A. scoparia*

27b. Middle stem leaves persistent pubescent; capitula 1–1.5 mm in diam., shortly pedunculate, in much-branched panicles ................................................... 168. *A. pewzowii*

23b. Perennial herbs, or nearly subshrubs, roots several, rarely solitary, but not narrowly fusiform; lobules in middle stem leaves narrowly linear; more than (0.5–)1 mm wide.

28a. Plants less and shorter branched; capitula in narrow panicles .............................................. 161. *A. macilenta*

28b. Plants more and long branched; capitula in broad or somewhat broad, rarely narrow, panicles.

29a. Capitula 1–1.5(–2) mm in diam., spreading apically on branches or branchlets and in broad and elongated panicles.

30a. Basal and lowermost leaves 7–8 × 5–7.5 cm, 2- or 3-pinnatisect or -partite, lobules 10–20 × 2–4 mm; phyllaries revolute at apex ............................................. 162. *A. chienshanica*

30b. Basal and lowermost leaves 2–4(–5) × 1.5–3.5 cm, 2(or 3)-pinnatisect, lobules 5–10 × 0.5–1.5(–2) mm; phyllaries erect at apex ............................................. 163. *A. capillaris*

29b. Capitula 1.5–2 mm in diam., spreading on whole branches or branchlets.

31a. Middle stem leaves 1(or 2)-pinnatisect, segments 1 or 2(or 3) pairs, lobules narrowly linear; capitula several, in narrow or somewhat broad panicles.

32a. Middle stem leaves 3–3.5 × 3–4 cm, lobes (10–)20–30 × 1–2 mm; capitula in narrow panicles ...................................................... 164. *A. morrisonensis*

32b. Middle stem leaves 1.5–2.5 × 1.5–2.5 cm, lobes 3–5 × 0.5–1 mm; capitula in somewhat broad panicles ...................................................... 159. *A. gansuensis*

31b. Middle stem leaves 1-pinnatisect, or 2-pinnatisect and then lobes or lobules linear-lanceolate or nearly subulate, segments in middle stem leaves 2 or 3 pairs; capitula in broad or somewhat broad, rarely narrow, panicles.

Disk florets 4–14, male; corolla campanulate, 2–2.5, 5-lobed.

female florets 6–10[–15]; corolla 0.5–1 mm, glandular, 2-fid.

laries oblong or lanceolate, inner orbicular-oblong. Marginal

= 18, 36, 54, 72, 90.

and used as a source of winter fodder for sheep in Xizang.

Asia, C, E, and W Europe, North America]

zan, Mongolia, N and W Pakistan, Russia, Tajikistan; C and SW

N Shaanxi, N Shanxi, Xinjiang, W Xizang [Afghanistan, N

steppes, dry river valleys, rocky slopes, saline-alkaline soils; 500–3800

gins, waste areas, roadsides, terraces, subalpine meadows, meadow

Capitula remote to approximate, nodding; peduncles curved, to

5 mm. Involucre subglobose, ovoid, or hemispheric, 2–5 mm in
diam.; phyllaries glabrescent, scarious margin broad,

3mm in diam.; synflorescence a broad to racemelike leafy panicle;

branches ascending to erect, sometimes appressed, to 10 cm.

Capitula to approximate, nodding; peduncles curved, to

5 mm. Involucre subglobose, ovoid, or hemispheric, 2–5 mm in
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branches ascending to erect, sometimes appressed, to 10 cm.

Capitula to approximate, nodding; peduncles curved, to

5 mm. Involucre subglobose, ovoid, or hemispheric, 2–5 mm in
diam.; phyllaries glabrescent, scarious margin broad,

**青海龙蒿** qing hai long hao

Leaf blade linear-lanceolate or linear. Synflorescence a lax panicle. Capitula with 2–5 mm peduncles, nodding. Involucre 2–5 mm in diam.

- Waste areas, roadsides; 2500–3500 m. E and N Qinghai.


**帕米尔蒿** pa mi er hao


Fertile shoots many, 20–30(–40) cm tall. Stem, branches, and leaves densely tomentose, later sparsely so. Leaves closely spaced; leaf blade lanceolate, entire. Synflorescence a dense, narrow panicle. Capitula closely spaced along short lateral branches.

- Rocky slopes, meadow steppes; 3000–3400 m. Qinghai, W Xinjiang, W Xizang [Afghanistan, W Pakistan, Tajikistan].


**圆头蒿** yuan tou hao


Shrubs, 80–150 tall, with a strong woody stock, long and shortly branched, puberulent or glabrescent, incanous or yellowish, bark flaking off. Leaves ± succulent. Lower and middle stem leaves: petiole 0.3–0.8 cm; leaf blade broadly ovate or ovate, 2–5(–8) × 1.5–3(–4) cm, puberulent or glabrescent, 1- or 2-pinnatisect; segments (1 or)2 or 3 pairs, lateral middle lobes longer than other lobes, 3-sect; lobules linear or falcate, (5–)10–20(–30) × (1–)1.5–2 mm, apex mucronulate. Uppermost leaves pinnatisect or 3-lobed; leaflike bracts linear, entire. Synflorescence a broad, much-branched panicle. Capitula many, shortly pedunculate or ± sessile, erect. Involucre ovoid, (2.5–)3–4 mm in diam. Marginal female florets 4–8. Disk florets 8–15, male. Achenes ovoid-oblong or obovoid-ellipsoid. Fl. and fr. Jul–Oct.

- Dunes of desert areas; low to middle elevations. N Hebei, S Nei Mongol.

*Artemisia wudanica* is used for windbreaks and sand stabilization.


**盐蒿** yan hao

*Artemisia intramongolica* H. C. Fu; *A. intramongolica* var. *microphylla* H. C. Fu; *Oligosporus halodendron* (Turczaninow ex Besser) Poljakov.

Shrubs, 50–80 tall, with many long branches and branchlets, glabrescent, purple. Leaves puberulent or glabrescent. Lower and middle stem leaves: petiole 1–4 cm; leaf blade broadly ovate or suborbicular, 1- or 2-pinnatisect; segments (2 or)3 or 4 pairs, basal lobes longer than others; lobules 1 or 2 pairs, linear, 10–15(–20) × 0.5–1 mm, apex mucronulate. Uppermost leaves and leaflike bracts 3–5-sect or entire. Synflorescence a broad, much-branched panicle. Capitula many, shortly pedunculate or ± sessile, erect. Involucre ovoid, (2.5–)3–4 mm in diam. Marginal female florets 4–8. Disk florets 8–15, male. Achenes ovoid-oblong or obovoid-ellipsoid. Fl. and fr. Jul–Oct.


*Artemisia halodendron* is used for windbreaks and sand stabilization.


**康马蒿** kang ma hao

Subshrubs, 30–40 cm tall, with short capitate branches, puberulent or glabrescent. Lower and middle stem leaves ± sessile; leaf blade oblong or elliptic, 1–2.5 × 0.5–1 cm, abaxially puberulent or glabrescent, pinnatisect; segments 1 or 2 pairs; lobes linear, linear-lanceolate, or falcate, 3–6 × ca. 1 mm. Upper leaves and leaflike bracts 3-lobed or entire. Synflorescence a narrow, spikelike panicle. Capitula sessile or shortly pedunculate. Involucre globose or hemispheric, 5–6 mm in diam. Marginal female florets 8–15. Disk florets 20–35, male; corolla limb puberulent. Achenes obvoid or ovoid. Fl. and fr. Aug–Oct.

- Roadside, slopes; 4300–4500 m. E Xizang.

准噶尔沙蒿 zhan ga er sha hao

Oligosporus songaricus (Schrenk ex Fischer & C. A. Meyer) Poljakov.

Shrubs, 30–80 cm tall, with a thick rootstock, branches many, nearly horizontally, puberulent or glabrescent. Lower and middle stem leaves sessile; leaf blade ovate-oblong, 2–4 × ca. 2 cm, 1- or 2-pinnatisect; segments 2 or 3 pairs, lateral and basal lobes usually 3-sect; lobules linear, 5–10(–12) × 1.5–2 mm, apex mucronulate. Uppermost leaves and leaflike bracts linear. Synflorescence a lax, broad panicle. Capitula sessile or shortly pedunculate, nodding. Involucre ovoid, 1.5–2 mm in diam. Marginal female florets 4 or 5. Disk florets 6–10, male. Achenes obovoid or ovoid-ellipsoid. Fl. and fr. Jul–Sep.

- Dunes of desert areas, rocky slopes; low to middle elevations. N Xinjiang [Kazakhstan].


黑沙蒿 hei sha hao

Artemisia ordosica var. furva H. C. Fu; A. ordosica var. montana H. C. Fu; A. salsoloides Willdenow var. mongolica Pampanini, p.p.

Subshrubs, 50–100 cm tall, with a strong woody stock, much branched, purple or later brown. Lowermost leaf blades 3–5(–7) × 2–4 cm, 1- or 2-pinnatisect, basal lobes 2- or 3-lobed. Middle stem leaves ± sessile; leaf blade pinnatisect; segments 3 or 4 pairs, linear, 15–30 × 0.5–1 mm, straight or falcate. Uppermost leaves and leaflike bracts 3- or 5-sect or entire. Synflorescence a broad panicle, nodding or oblique. Involucre ovoid, 1.5–2.5 mm in diam. Marginal female florets 10–14. Disk florets 5–7, male. Achenes obovoid. Fl. and fr. Jul–Oct. 2n = 36*.

- Dunes, desert areas, dry slopes, desert steppes; low to middle elevations to 1500 m. N Hebei, N Nei Mongol, N Shanxi; cultivated in C and W Gansu, Ningxia, N Shaanxi, and Xinjiang.

Artemisia ordosica is used for windbreaks and sand stabilization. It is also used for making anti-inflammatory drugs.


藏岩蒿 zang yan hao


Subshrubs, 30–60 cm tall, branching from below middle, branches ascending, most parts adpressed pubescent, hairs medifixed, ± rapidly glabrescent. Lowermost leaves shortly petiolate. Middle stem leaves sessile; leaf blade oblong or sub-oblanceolate, 2–3 × 2–2.5 cm, pinnatisect [to palmatisect]; segments 2 or 3 pairs, linear, occasionally forked, 8–12 × 1–1.5 mm. Uppermost leaves 3- or 5-lobed; leaflike bracts linear. Synflorescence a lax conical panicle, to 40 cm; branches elongated. Capitula solitary or in groups of 2 or 3, nodding, secund, sometimes peduncle longer than involucre, bracteolate. Involucre globose, ovoid, or broadly ovoid, 2.5–3 mm in diam.; phyllaries glabrous. Marginal female florets 5–8. Disk florets 6–15, male. Achenes obovoid or ovoid-ellipsoid. Fl. and fr. Jul–Sep.

- Dry hills, subalpine semidesert steppes; 2500–3600 m. SE Qinghai, W Sichuan, E Xizang.


蒙古沙地蒿 meng gu sha di hao

Artemisia xylorhiza Krascheninnikov ex Filatova.

Subshrubs, 30–60 cm tall, with a thick rootstock, much branched. Lower and middle stem leaves: petiole 2–3(–4.5) cm; leaf blade broadly ovate or suborbicular, 2–3 × 2–3 cm, 1- or 2-pinnatisect; segments 2( or 3) pairs, lateral middle lobes 3-lobed; lobes or lobules linear, 10–15 × 0.5–1 mm. Uppermost leaves and leaflike bracts 3- or 5-lobed or entire. Synflorescence a broad panicle. Capitula nodding. Involucre subglobose, 2.5–2.75 mm in diam. Marginal female florets 3–5. Disk florets 5–10, male. Achenes obovoid. Fl. and fr. Jul–Oct.

- Dunes of desert and semidesert areas, steppes; below 1500 m. E and SE Nei Mongol [Mongolia].


假岩蒿 jia yao hao

Subshrubs, 30–35 cm tall, with a thick rootstock. Lower and middle stem leaves: petiole 1–1.5 cm; leaf blade suborbicular, oblong, or ovate, 0.5–0.8 × 0.5–0.8 cm, pubescent or glabrescent, 2-pinnatisect; segments 2 pairs, 2- or 3-sect; lobules linear or narrowly lanceolate, 2–3 × ca. 1 mm, apex mucronulate. Upper leaves and leaflike bracts 3- or 5-sect. Synflorescence a ± narrow panicle. Capitula nodding. Involucre ovoid, 1–1.5 mm in diam. Marginal female florets 2–4. Disk florets 3–5, male. Achenes obovoid. Fl. and fr. Aug–Oct.

- Sand dunes, dune margins, waste areas. Nei Mongol, Ningxia.


黄绿蒿 huang li hao

Oligosporus xanthochrous (Krascheninnikov) Poljakov.

Subshrubs, 20–60 cm tall, pubescent or glabrescent. Lower and middle stem leaves: petiole 5–15 mm; leaf blade ovate, 1.5–2 × 1.5–2 cm, pinnatisect; segments of lower leaves 2 or 3 pairs, segments of middle leaves 1 or 2 pairs, linear or linear-lanceolate, 5–10 × 1.5–2.5 mm. Capitula in narrow or somewhat broad panicles. Involucre ovoid, 2–2.5 mm in diam. Marginal female florets 3–6. Disk florets 3–7, bisexual. Achene ovoid. Fl. and fr. Aug–Oct.

- Dry slopes, steppes, Gobi Desert. N Nei Mongol [Mongolia].

光沙蒿 guang sha hao

*Artemisia pubescens* Ledebour var. *oxycephala* (Kitagawa) Kitagawa.

Subshrubs, 50–80 cm tall, with a thick rootstock. Lowermost leaves long petiolate; middle stem leaves ± sessile; leaf blade broadly ovate or suborbicular, 2–5 × 2–3 cm, puberulent or glabrescent; 2-pinnatisect; segments 2 or 3 pairs; lateral lobes 3-sect; lobules linear, 15–20 × 1.5–2 mm. Uppermost leaves and leaflike bracts 3–5-sect or entire. Synflorescence a lax, ± broad panicle. Involucre ovoid, 1.5–2.5(–3.5) mm in diam. Marginal female florets 8–14. Disk florets 3–10, male. Achenes ovoid. Fl. and fr. Aug–Oct.


荒野蒿 huang ye hao

*Oligosporus campestris* (Linnaeus) Cassini.

Subshrubs, 50–80 cm tall, with a thick rootstock, much branched, faintly aromatic, pubescent or glabrescent. Lowermost leaves: petiole 3–5 cm; leaf blade broadly ovate or ovate, (3–)4–5(–8) × 2.5–5 cm, 2(or 3)-pinnatisect; segments 4 or 5 pairs, 3–5-sect; lobules narrowly linear or narrowly linear-lanceolate, 4–10 × (0.5–)1–1.5–2 mm, apex mucronulate. Middle stem leaves sessile, 1(or 2)-pinnatisect; segments 3 or 4 pairs. Uppermost leaves and leaflike bracts 3–5-sect or entire. Synflorescence a lax, broad panicle. Involucre ovoid, 1.5–2.5 mm in diam. Marginal female florets 3–6[–20]. Disk florets 6–12, bisexual. Achenes ovoid. Fl. and fr. Jul–Oct. 2n = 18, 36.

Stems, waste areas, rocky slopes, dune margins; 300–3100 m. N Gansu, Taiwan, Xinjiang [Japan, Russia; C Asia, Europe, North America].

We have not seen material of *Artemisia campestris var. glomerata* Pampanini (Nuovo Gior. Bot. Ital., n.s., 34: 642. 1927), described as an annual with ± filiform leaf segments.


中亚旱蒿 zhong ya han hao


148a. Artemisia marshalliana var. marshalliana 中亚旱蒿原变种 zhong ya han hao (yuan bian zhong)

Stems with few branches above base; vegetative parts and phyllaries persistently glabrescent, later glabrescent. Synflorescence a slender, ascending conical panicle. Steppes, forest steppes, wastelands, rocky slopes, hills; 500–2200 m. N Xinjiang [Kazakhstan, Russia; Europe].


绢毛旱蒿 juan mao han hao


Stems, branches, leaves, and phyllaries persistently sericeous-pubescent. Stems branching to form a broad compound panicle. Steppes, forest steppes, wastelands, rocky slopes, hills; 500–2200 m. N Xinjiang [Kazakhstan, Russia; Europe].


昆仑沙蒿 kun lun sha hao

Subshrubs, 30–40 cm tall, with a thick rootstock and capitate branches. Lower and middle stem leaves: petiole 3–15 mm; leaf blade ovate, 1.3 × 0.5–2.5 cm, yellowish pubescent or glabrescent, 1(or 2)-pinnatisect; segments 2 pairs, linear, straight or falcate, 3–8(–15) × 0.5–1 mm, margin deeply serrate, apex obtuse and mucronulate. Uppermost leaves and leaflike bracts pinnatisect, 3-sect, or entire. Synflorescence a narrow panicle. Capitula contiguous along ultimate branches, nodding. Involucre oblong-ovoid or ellipsoid, 2–2.5 mm in diam. Marginal female florets 4 or 5. Disk florets 4–6, male. Achenes oblong or oblong-obovoid. Fl. and fr. Aug–Oct. 2n = 36.
Rocky terraces, canyons, dry valleys, roadsides; 1300–2500 m.
SW Xinjiang [Kyrgyzstan].


玉树龙蒿 yu shu long hao

Lobes of middle stem leaves falcate-lanceolate, 8–15 mm, apex acuminate. Capitula shortly pedunculate.

- Slopes, waste areas; middle to high elevations. S Qinghai, N Xizang.


江孜蒿 jiang zi hao

Subshrubs, 20–30 cm tall; branches capitulate, 4–5 cm, puberulent, glabrescent. Lower and middle stem leaves: petiole 1–2 cm; leaf blade ovate or oblong, 3.5–4.5 × 2–3 cm, pinnatisect; segments 3 pairs, 8–12 × ca. 5 mm; lobules 1 or 2 pairs, linear-lanceolate or linear, 5–10 × 1.5–2 mm, base attenuate, margin revolute, midvein white, prominent abaxially. Uppermost leaves pinnatisect; leaflike bracts 3–5 sect or entire. Synflorescence a narrow panicle. Involucre globose to ovoid-globose, 2.5–3.5 mm in diam. Marginal female florets 3–8. Disk florets 10–20, male. Achenes obovoid or ovoid-elliptic. Fl. and fr. Jul–Sep.

- Slopes; ca. 3900 m. S Gansu, Qinghai, E Xizang.

153. Artemisia xigazeensis Y. R. Ling & M. G. Gilbert, sp. nov.

日喀则蒿 ri ka ze hao

Type: China. Xizang: N of Phari, 1882, Dr. King’s Collector 54 (holotype, K).

Paratypes: China. Xizang: near Phari, 14,500 ft., Sep 1838, B. J. Gould 1621 (K); Dochen Lake Camp, ca. 15,000 ft., 24 Jun 1939, B. J. Gould 2194 (K); Valley ca. 10 km NNE of Lhasa, 4,150 m, 2 Aug 1989, B. Dickoré 3628 (K). Qinghai: E shore of Kokonor (Qinghai Hu), 10,700 ft., Sep 1925, J. F. Rock 13385 (K).

Planta petiolo rebus; caulibus multi erectis vel ascendentes, ramos ascendentes breves, angusti, internodo brevi, lobatis, membranaceis.

- Roadsides, riverbanks, shrublands, slopes, dry valleys, waste areas; 3000–4300 m. S Qinghai, W Sichuan, Xizang, W Yunnan.

1a. Lobes of leaves linear or linear-lanceolate, 3–8 mm, obtuse; capitula sessile .......... 151a. var. waltonii

1b. Lobes of leaves falcate-lanceolate, 8–15 mm, acuminate; capitula shortly pedunculate .................... 151b. var. yushuensis

151a. Artemisia waltonii var. waltonii

藏龙蒿 zang sha hao

Lobes of middle stem leaves linear or linear-lanceolate, 3–8 mm, apex obtuse. Capitula sessile.

- Roadsides, riverbanks, shrublands, slopes, dry valleys; 3000–4300 m. S Qinghai, W Sichuan, Xizang, W Yunnan.
Herbs, perennial, 15–25 cm tall, branched apically, gray pubescent. Lower and middle stem leaves ± sessile; leaf blade oblong or oblong-ovate, 1.5–2×0.5–1.5 cm, pinnatisect; segments 2 or 3 pairs in lowermost leaves and 1 or 2 pairs in middle leaves, linear or linear-lanceolate, 2–5×0.5–1.5 mm. Uppermost leaves and leaflike bracts 3–5-lobed or entire. Synflorescence a narrow panicle. Involucre semi-globose, 2.5–3 mm in diam.; phyllaries white or yellowish sericeous-puberulent. Marginal female florets 1 or 2. Disk florets 3–7, male. Achenes oblong or ellipsoid, ca. 1.5 mm, apex acute to slightly cuspitate. Middle stem leaves: leaf blade suborbicular or ovate, 5–25×5–25 mm, subpalmately 5–7-partite; lobes not or rarely (2 or)3–5-lobe 1; lobes or lobules linear-lanceolate, 2–5×0.5–1.5 mm. Uppermost leaves 3–5-partite; leaflike bracts linear. Synflorescence a spike-like or racemelike panicle. Involucre ovoid, 2.5–3 mm in diam.; phyllaries white or yellowish sericeous-puberulent. Marginal female florets 5 or 6. Disk florets 9–12, male. Achenes oblong or ovate, ca. 1.5 mm, apex acute to slightly cuspitate. Middle stem leaves: leaf blade orbicular or ovate, 1.5–3×1.5–2 cm, pinnatisect; segments 2 pairs, linear-lanceolate, 15–20×1–1.5(–2) mm. Uppermost leaves 3–5-lobed or entire. Synflorescence a narrow panicle, branches very short, to 5 mm, sometimes branching from lower nodes to form large panicle. Involucre subglobose, 2–2.5 mm in diam. Marginal female florets 2 or 3. Disk florets 4–8, male. Achenes minute. Fl. and fr. Sep.–Nov.

- Slopes, waste areas; 2200–3800 m. Yunnan.


亮苞蒿 liang bao hao

Subshrubs, 50–75 cm tall, rhizomatous, densely gray pubescent. Lower and middle stem leaves ± sessile; leaf blade ovate, 2–4×1.5–3 cm, pinnatisect; segments 2 pairs, linear-lanceolate, 15–20×1–1.5(–2) mm. Uppermost leaves 3–5-sect; leaflike bracts 3-sect or entire. Synflorescence a narrow panicle, branches very short, to 5 mm, sometimes branching from lower nodes to form large panicle. Involucre subglobose, 2–2.5 mm in diam. Marginal female florets 2 or 3. Disk florets 4–8, male. Achenes minute. Fl. and fr. Sep.–Nov.

- Slopes, waste areas; 2200–3800 m. Yunnan.


小亮苞蒿 xiao liang bao hao

Artemisia mairei f. latifolia Pampanini.

Herbs, perennial, 40–60 cm tall, erect, yellowish pubescent. Lower and middle stem leaves sessile; leaf blade ovate, 1.5–3×1–2 cm, pinnatisect; segments 2 pairs, subulate or linear-subulate, 10–15×ca.1 mm. Uppermost leaves and leaflike bracts 3-sect or entire. Synflorescence a narrow to broad panicle, branches ascending, sometimes reduced to simple racemes, sometimes producing secondary panicles and broad synflorescence. Capitula spreading, subglobose. Involucre subglobose, (1.5–)2 mm in diam.; phyllaries glabrous. Marginal female florets 2 or 3(?–7). Disk florets 3–7, male. Achenes minute. Fl. and fr. Aug.–Nov.

- Slopes, roadsides; 2100–3600 m. Yunnan.


柔毛蒿 rou mao hao

Herbs, perennial, or subshrub 25–60(–70) cm tall, with a thick rootstock, lower parts yellow-brown tomentose, upper parts gray pubescent, glabrescent. Basal and lower stem leaves long petiolate; leaf blade 4–8×(12)×1.5–2 cm, 2-pinnatisect. Middle stem leaves: petiole (0–)2–5 cm; leaf blade ovate, rather densely pubescent to glabrous, (1 or)2 or (3)–5-pinnatisect; segments (2 or)3 or 4 pairs, basal and middle leaves lobulate; lobules linear or linear-lanceolate, 10–30×0.5–1.5(–2) mm. Uppermost leaves pinnatisect; leaflike bracts 3-sect or entire. Syn-

Three varieties are recognized in China; Russian authors recognize three further varieties from outside of China.

1a. Involucre broadly ovoid, 2.5–3 mm in diam.; capitula erect or oblique, in narrow panicles ............................. 158b. var. geblerianna

1b. Involucre subglobose or ovoid, 1.5–2 mm in diam.; capitula in broad or somewhat broad panicles.

2a. Herbs; leaf blades abaxially persistently puberulent ............... 158a. var. pubescens

2b. Subshrubs; leaf blades abaxially glabrescent ............................. 158c. var. coracina

158a. Artemisia pubescens var. pubescens

柔毛蒿(原变种) rou mou hao (yuán biàn zhòng)

Artemisia campnephris Linnaeus var. pubescens (Ledebour) Trautvetter; A. capillaris Thunberg var. simplex Maximowicz; A. commutata Besser, A. commutata var. helmiana Besser; A. commutata var. pallasianna Besser; A. commutata var. pubescent (Ledebour) Poljakov; A. desertorum Sprengel f. helmiana (Besser) Pampanini; A. desertorum var. pallasianna (Besser) Pampanini; Oligosporus adinis Lessing; O. commutatus (Besser) Poljakov.

Herbs, perennial. Leaves persistently pubescent. Synflorescence a moderately broad panicle. Capitula oblique or nodding. Involucre subglobose or ovoid, 1.5–2 mm in diam.

Steppes, forest steppes, meadows, forest margins, hills, waste areas, rocky slopes, roadsides; low to middle elevations. Gansu, Heilongjiang, Jilin, Liaoning, Nei Mongol, Qinghai, N Shaanxi, N Shanxi, NW Sichuan, Xinjiang [Mongolia, Russia].


大头柔毛蒿 da tou rou mou hao


Herbs, perennial. Leaves glabrescent. Synflorescence a narrow panicle. Capitula erect or oblique. Involucre broadly ovoid, 2.5–3 mm in diam.

Heilongjiang, Jilin, Liaoning, Nei Mongol [Mongolia, Russia].


黑柔毛蒿 hei rou mou hao


Subshrubs. Leaves glabrescent. Synflorescence a broad panicle. Capitula oblique or nodding. Involucre subglobose or ovoid, 1.5–2 mm in diam.

Steppes, forest steppes, meadows, forest margins, hills, waste areas, rocky slopes, roadsides; low to middle elevations. Gansu, Heilongjiang, Jilin, Liaoning, Nei Mongol, Qinghai, N Shaanxi, N Shanxi, NW Sichuan, Xinjiang [Mongolia, Russia].

Three varieties are recognized in China; Russian authors recognize three further varieties from outside of China.

1a. Involucre broadly ovoid, 2.5–3 mm in diam.; capitula erect or oblique, in narrow panicles ............................. 158b. var. geblerianna

1b. Involucre subglobose or ovoid, 1.5–2 mm in diam.; capitula in broad or somewhat broad panicles.

2a. Herbs; leaf blades abaxially persistently puberulent ............... 158a. var. pubescens

2b. Subshrubs; leaf blades abaxially glabrescent ............................. 158c. var. coracina

158a. Artemisia gansuensis var. pubescens

甘肃蒿 gan su hao

Subshrubs, 18–30(–40) cm tall, with a thick rootstock, gray puberulent or glabrescent. Lowermost leaves shortly petiolate; leaf blade broadly ovate or suborbicular, 2–3(–3.5) × 2–3 cm, 2-pinnatisect; segments (2 or)3(or 4) pairs, 3-sect. Middle stem leaves ± sessile; leaf blade 1.5–2.5 × 1.5–2.5 cm; lobules linear, 5–8 × 0.5–1 mm, apex mucronulate. Uppermost leaves and leaf-like bracts 3- or 5-lobed. Synflorescence a conical panicle, lower branches to 4 cm, very slender, often also on well-developed spreading lateral branches forming large, lax panicle. Capitula peduncle 0–5 mm. Involucre ovoid-campanulate or narrowly ovoid, 1–2 mm wide. Marginal female florets 3–6. Disk florets 4–8, male. Achenes obovoid. Fl. and fr. Aug–Oct.

- Dry slopes, roadsides. Gansu, N Hebei, Nei Mongol, Ningxia, Qinghai, Shaanxi, N Shanxi.

159a. Artemisia gansuensis var. gansuensis

甘肃蒿(原变种) gan su hao (yuán biàn zhòng)

Capitula: peduncle 0–2 mm. Involucre 1.5–2 mm in diam.

- Dry slopes, roadsides. Gansu, N Hebei, Nei Mongol, Ningxia, Qinghai, Shaanxi, N Shanxi.

159b. Artemisia gansuensis var. oligantha

小甘肃蒿 xiao gan su hao

Capitula: peduncle 3–5 mm. Involucre 1(–1.5) mm in diam.

- Gobi Desert margins. S Nei Mongol.

160. Artemisia demissa


纤杆蒿 xian gan hao

Oligosporus demissus (Krascheninnikov) Poljakov.

Herbs, annual or biennial, 5–20 cm, much branched; lower branches procumbent, yellowish pubescent or glabrescent. Lower stem leaves: petiole 0.5–1 cm; leaf blade oblanceolate or ovate, 1–1.5 × 0.8–1.3 cm, 2-pinnatisect; segments 2 or 3; lobules narrowly linear-lanceolate or elliptic-lanceolate, 3–5 × ca. 1 mm, apex mucronulate. Middle and upper stem leaves...

Valleys, slopes, roadsides, grasslands, rocky hills; 2600–4800 m. Gansu, Nei Mongol, Qinghai, W Sichuan, Xinjiang, Xizang [Afghanistan, India, Tajikistan].


細杆沙蒿 xi gan sha hao


Herbs, perennial, or nearly subshrubs, 40–70 cm tall, puberulent, often glabrescent. Lower stem leaves: petiole 1–3 cm; leaf blade ovate or broadly ovate, 2–4 × 2–4 cm, 2-pinnatisect; segments 2 or 3 pairs. Middle and upper stem leaves ± sessile; leaf blade pinnatisect; segments 2 pairs; lobules 7–12(–15) × 0.3–0.5(–1) mm. Leaflike bracts linear, entire. Synflorescence a narrow panicle. Involucre ovoid or subglobose, 1.5–2 mm in diam. Marginal female florets 3–6. Disk florets 4–8, male. Achenes obvoid. Fl. and fr. Aug–Oct.

Dry slopes, valleys, roadsides, forest margins, steppes; low to middle elevations. N Hebei, Nei Mongol, N Shanxi [E Heilongjiang, E Jilin, E Heilongjiang, E Qinghai, E Gansu, Nei Mongol, Qinghai, W Sichuan, Xinjiang, Xizang [Afghanistan, India, Tajikistan].


千山蒿 qian shan hao

Subshrubs, 25 cm tall or more, brown or yellowish tomentose or glabrescent. Lowermost leaves: petiole 1–3 cm; leaf blade ovate or obovate, 7–8 × 5–7.5 cm, 2- or 3-pinnatisect or -partite; segments 4(or 5) pairs; lobules (1 or) 2 pairs, lanceolate, linear, or linear-lanceolate. Middle stem leaves: petiole 0.5–1 cm; leaf blade ovate or broadly ovate, 2-pinnatisect; segments 2 or 3(or 4) pairs; lobules narrowly linear or linear-lanceolate, 5–15 × 1–1.5 mm. Uppermost leaves and leaflike bracts pinnatisect or -sect. Synflorescence a broad, much-branched panicle. Involucre oblong, 1–1.5 mm in diam.; phyllaries revolute apically. Marginal female florets 5–7. Disk florets 5 or 6, male. Achenes oblong. Fl. and fr. Aug–Oct.

- Hills, slopes. Liaoning (Anshan, Qian Shan).


细叶山艾 xi ye shan ai


Herbs, biennial or perennial, 30–80(–100) cm tall; rootstock vertical, woody; stems usually 1 to few, slender, erect, pale purplish or reddish brown, glabrous. Basal leaves silky hairy, shortly petiolate. Middle stem leaves almost sessile; leaf blade oblong-ovate, 2–4 × 1–2.5 cm, 1- or 2-pinnatisect; segments filiform, 8–12 × 0.3–0.5 mm, ± acute. Uppermost leaves and leaflike bracts simple, filiform with 1 or 2 basal auricles. Synflorescence a narrow to wide panicle, 10–30 × 5–15 cm; primary branches 8–20 cm, ascending, bearing 3–8 cm, ± patent secondary branches. Capitula many, shortly pedunculate to sessile, secund, approximate, nodding. Involucre ovoid, ca. 1.75–2.25 × 1–1.5 mm; phyllaries 3- or 4-seriate, laxly imbricate, glabrous; outermost ovate, ca. 0.75 mm, green with narrow membranous margin, ± acute; inner ones elliptic, ca. 1.25 mm, with broad membranous margin, obtuse. Receptacle conical, glabrous. Florets 8–12, yellow. Marginal female florets 3–5; corolla narrowly tubular, ca. 0.75 mm, 2-toothed. Disk florets 5–7, male; corolla narrowly conical, ca. 1.25 mm, 5-toothed, glandular. Achenes brown, oblong-ovate, ca. 0.8 mm.

Humid slopes, hills, terraces, roadsides, riverbanks; 100–2700 m. Anhui, Fujian, Guangdong, Guangxi, Hebei, E Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, E and S Shanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Cambodia, Indonesia, Japan, Korea, Malaysia, Nepal, Philippines, E Russia, Vietnam].

_Artemisia capillaris_ is well known as a source of diuretic and detoxifying medicines.


细叶山艾 xi ye shan ai

Subshrubs, 50–60 cm tall, puberulent, glabrescent. Lower stem leaf blades suborbicular or ovate-triangular, 3–4 × ca. 4 cm, 2(or 3)-pinnatisect. Middle stem leaves: petiole 1–2 cm; leaf blade 3–3.5 × 3–4 cm, 1(or 2)-pinnatisect; segments 2(or 3) pairs, 3-lobed; lobules 10–20 × 1–2 mm. Uppermost leaves and leaflike bracts 3–5-lobed. Synflorescence a narrow, racemelike panicle. Capitula shortly pedunculate or ± sessile. Involucre subglobose, 1.5–2 mm. Marginal female florets 11–15. Disk florets 4–16, male. Achenes ellipsoid. Fl. and fr. Jun–Nov. 2n = 34*.

- Forest margins, roadsides, slopes; 300–2500 m. Taiwan.


高山艾 gao shan ai

_Artemisia borealis_ Pallas var. _oligocarpa_ (Hayata) Kita-mura.

Subshrubs, 15–35 cm tall, sericeous-pubescent or glabrescent. Leaves sericeous-pubescent or glabrescent. Lower and middle stem leaves: petiole 0.5–1 cm; leaf blade broadly ovate, 2.5–4.5 × 2.5–4.5 cm, 2(or 3)-pinnatisect; segments 2 or 3(or 4) pairs; lobules 3 or 5, linear or filiform, 4–10 × 0.5–1 mm. Up-

- Grasslands, high mountaintops; 2500–3800 m. Taiwan.


猪毛蒿 zhu mao hao

*Artemisia capillaris* Thunberg subf. angustisecta Pampanini; *A. capillaris* f. elegans (Roxburgh) Pampanini; *A. capillaris* f. myriocephala Pampanini; *A. capillaris* var. scoparia (Waldstein & Kitaibel) Pampanini; *A. capillaris* subf. tenufolia Pampanini; *A. capillaris* f. williamsonii Pampanini; *A. elegans* Roxburgh; *A. kohatica* Klatt; *A. scoparia* var. heteromorpha Kitagawa; *A. scoparia* f. sericea Komarov; *A. scopariaformis* Popov; *Oligosporus scoparius* (Waldstein & Kitaibel) Poljakov.

Herbs, perennial, biennial, or annual, 40–90(–130) cm tall, much branched from lower on stem; branches and leaves gray or yellowish sericeous-pubescent, later glabrescent, strongly aromatic. Lower stem leaves: petiole 2–4 cm; leaf blade ovate-oblong or elliptic, 1.5–3.5 × 1–3 cm, 2- or 3-pinnatisect; segments 3 or 4 pairs; lobules 1 or 2 pairs, 3–5 × 0.2–1 mm. Middle stem leaves sessile; leaf blade oblong or ovate-oblong, 1–2 × 0.5–1.5 cm, 1- or 2-pinnatisect; segments 2 or 3 pairs; lobules filiform, usually curved, 4–8 × 0.2–0.3(–0.5) mm. Uppermost leaves and leaflike bracts 3–5-sect. Synflorescence a broad panicule. Capitula many, shortly pedunculate or sessile. Involucre subglobose, rarely ovoid, 1–1.5(–2) mm in diam. Marginal female florets 5–7. Disk florets 4–10, male. Achenes obovoid, 0.6–0.8 mm. Fl. and fr. Jul–Aug.

Dry slopes, roadsides, forest margins, valleys, waste areas, shrublands; 2200–4700 m. C Guangxi, Guangdong, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Bhutan, N India, Nepal].

1a. Stem 20–40(–90) cm tall, erect; branches not diffuse ...................................................... 166a. var. stricta
1b. Stem 10–20 cm tall, spreading; lower branches diffuse ............................................. 166b. var. diffusa

**166a. Artemisia stricta** var. stricta 直茎蒿(原变种) zhi jing hao (yu an bian zhong)

*Artemisia edgeworthii* Balakrishnan, nom. illeg. superfl.

Stem 20–40(–90) cm tall, erect; branches not diffuse.

Dry slopes, roadsides, forest margins, valleys, waste areas, shrublands; 2200–4700 m. C Guangxi, Guangdong, Guizhou, Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Qinghai, Shaanxi, Shanxi, Sichuan, Xinjiang, Xizang, Yunnan [Bhutan, N India, Nepal].

“Artemisia stricta” B. Heyne” (Candolle, Prodr. 5: 374. 1836) was merely cited as a synonym of *Cyathocline stricta* Candolle and was therefore not validly published (Vienna Code, Art. 34.1(c)).

**166b. Artemisia stricta** var. diffusa (Pampanini) Y. R. Ling & M. G. Gilbert, comb. in stat. nov.

披散直茎蒿 pi san zhi jing hao


Stem 10–20 cm tall; lower branches diffuse and prostrate.

W Sichuan, E Xizang, W Yunnan [N India, Nepal].


纤梗蒿 xian geng hao

Herbs, annual, biennial, or perennial, (15–)40–50 cm tall, branching from most nodes, branches ascending, gray pubescent or glabrescent. Lower stem leaves: petiole 1.5–3.5 cm; leaf blade ovate, 2–3 × 1–1.5 cm, pubescent, 2-pinnatisect; segments 2 or 3 pairs, 3-lobed; lobules linear-lanceolate to elliptic-lanceolate, 3–5 × 0.5–1 mm. Middle stem leaves sessile; leaf blade 1- or 2-pinnatisect; segments (1 or)2 or 3 pairs, 3-5-lobed; lobules filiform, 5–10 × 0.3–0.5 mm. Uppermost leaves and leaflike bracts 3–5-sect. Synflorescence a narrow panicle; branches from all but lowest node, ascending; ultimate branches to ca. 1 cm, erect. Capitula almost contiguous; peduncle to 3 mm. Involucre ovoid, 1–1.5 mm in diam.; phyllaries glabrous. Marginal female florets ca. 15. Disk florets 3–8, male. Achenes small. Fl. and fr. Aug–Nov.
• Desert steppes, rocky and grassy slopes; 1000–3900 m. Qinghai, Xinjiang, Xizang.


白莎蒿bai suo hao

Herbs, annual, 20–60 cm tall, many branched, gray pubescent, fetid. Lower and middle stem leaves: petiole 0.5–3 cm; leaf blade ovate-oblong or oblong, 1.5–4 × 0.3–0.8 cm, densely gray pubescent, (1 or)2-pinnatisect; segments 5–8 pairs, ovate-oblong or subobovate, 3–5 × 2–3 mm, serratate to pinnatipartite; teeth 5–8 pairs, 0.3–0.8(–1.5) × 0.3–0.8 mm. Uppermost leaves and leaflike bracts pinnatipartite or entire, latter elliptic-lanceolate or lanceolate, few serrate. Synflorescence a broad, diffuse panicle. Capitula shortly pedunculate. Involucre ellipsoid or oblong-ellipsoid, 1.5–2 mm in diam.; phyllaries gray puberulent. Female florets 2 or 3. Disk florets 3–6, male. Achenes ellipsoid. Fl. and fr. Jul.–Oct.

Dry slopes, grasslands, steppes, waste areas, roadsides, dunes near riverbanks; low elevations. Nei Mongol, Ningxia, N Shaanxi [Mongolia].


牡蒿组mu hao zu

Many species contain aromatic compounds and sesquiterpenoids and/or limited monoterpoids.


2a. Lower stem leaf petioles 5–7 cm; blades 10–15 cm; disk florets 25–30 .......................... 171. *A. bargusinensis*

2b. Lower stem leaf petioles to 3 cm; blades 2–5 cm; disk florets 10–20.

3a. Middle stem leaves spatulate or obovate-spatulate ............................................................. 181. *A. nanschanica*

3b. Middle stem leaves ovate, obovate-oblong, or elliptic.

4a. Leaf blade pinnatisect; lower and middle leaves with petiole 1–3 cm; florets 21–30 ........... 170. *A. depauperata*

4b. Leaf blade ternately 3-partite (or -cleft); lower and middle leaves ± sessile; florets 33–40 ........ 184. *A. tridactyla*

1b. Involucre 1–2.5(–3.5) mm in diam.; marginal florets 2–9, disk florets 2–15.

5a. Lower and middle stem leaf blades widest above middle, spatulate or subspatulate, often with attenuate base, serratate at apex, entire or 3–5-cleft with much broader middle lobe.

6a. Middle stem leaves 2–6 cm wide.

7a. Middle stem leaves 5.5–8 × 4–6 cm; involucre 2–3 mm in diam. ........................................ 176. *A. littoricolata*

7b. Middle stem leaves 2.5–4 × 2–4 cm; involucre 1.5–2(–3) mm in diam.

8a. Synflorescence a narrow, ± cylindric panicle ................................................................. 177. *A. manshurica*

8b. Synflorescence a broad, ± conical panicle ................................................................. 174. *A. eriopoda*

6b. Middle stem leaves 0.5–1.2(–2) cm wide.

9a. Basal leaves entire ...................................................................................................... 178. *A. japonica*

9b. Basal leaves 1- or 2-pinnatifoliate or -pinnatisect.

10a. Middle stem leaves 2–3 cm; lobes 1–2 mm wide ......................................................... 179. *A. parviflora*

10b. Middle stem leaves 1–1.5, lobes 3–4 mm wide ......................................................... 180. *A. hancei*

5b. Lower and middle stem leaves widest at or below middle.

11a. Middle stem leaves 3–5(–7)-partite.

12a. Branches 15–35 cm or more, usually flexuous and horizontal; middle stem leaves 3–7 cm wide ..... 183. *A. dubia*

12b. Branches 8–14 cm, ascending; middle stem leaves 0.8–1.5 cm wide.

13a. Middle stem leaves with lobes 10–20 mm; leaflike bracts 3-partite; corolla limb pubescent. .... 185. *A. giraldii*

13b. Middle stem leaves with lobes 5–8(–10) mm; leaflike bracts linear or linear-lanceolate; corolla limb puberulent ................................................................. 186. *A. conaensis*

11b. Middle stem leaves 1- or 2-pinnatisect or pinnatipartite.

14a. Rhizomes not shortly terete; middle stem leaves spatulate or attenuate, entire or obliquely 3–5-cleft, -partite, or -sect from apex to base, or leaves heteromorphic, spatulate or attenuate in sterile branches and 1( or)2-pinnatisect or -partite ........................................ 175. *A. angustissima*

14b. Rhizomes shortly terete; sterile and middle stem leaves not spatulate or attenuate, middle leaves 1- or 2-pinnatisect.

15a. Stem, branches, leaves, and phyllaries densely gray and yellowish sericeous-pubescent, later sparingly pubescent; middle stem leaves with 2 or 3 pairs of lobes ....................................................................................... 173. *A. duthreuil-de-rhinsi*
15b. Stem, branches, and leaves pubescent or glabrescent; middle stem leaves with 2 or 3 pairs of lobes.
16a. Middle stem leaves shortly petiolate, 1-pinnatifid, or 2-pinnatifid and then lobulate from mid-lateral lobes; capitula sparse ............................... 172. A. desertorum
16b. Middle stem leaves sessile, 1- or 2-pinnatisect, segments 2 or 3 pairs, basal lobes lobulate or not; capitula many, dense ................................................ 182. A. pengchuensis


Herbs, perennial, 10–20–(30) cm tall, with a short thick rootstock, gray or yellowish pubescent, later sparsely pubescent. Lower stem leaves: petiole 1–2 cm; leaf blade ovate or oblong, 2–3 × 1.5–2 cm, 2-pinnatisect; segments 3 or 4 pairs, elliptic; lobules 3–5 pairs, lanceolate, 3–5 × 1–1.5 cm, apex obtuse. Middle and upper stem leaves: leaf blade ovate or oblong, pinnatisect; segments 2 or 3 pairs; lobes linear-lanceolate, 5–15 × 2–3 mm; leaflike bracts linear-lanceolate or falcate. Synflorescence a narrow panicle. involucre (2–)2.5–3 mm in diam.; phyllaries brown, very thin.

Add the following to the list:

- Alpine or subalpine steppes, meadows, rocky slopes; 3500–4600 m. SW Gansu, W Sichuan, Xizang.
- Alpine or subalpine steppes, meadows, rocky slopes; 4000–4600 m. Qinghai, W Sichuan, E Xizang.
- Alpine or subalpine steppes, meadows, rocky slopes; 4600 m. SW Gansu, W Sichuan, Xizang.

Artemisia foetida Jacquemont ex Candolle, Prodr. 6: 98. 1838.

Stems clustered, less than 20 cm tall, shortly branched or not; most parts gray or yellowish pubescent. Middle stem leaves 1(or 2)-pinnatisect or -partite; segments linear. Synflorescence a racemelike panicle. involucre (2–)2.5–3 mm in diam.; phyllaries densely pubescent or glabrous. female florets 6–9. Disk florets 8–14, male. Achenes oblong or broadly ovoid. Fl. and fr. Jul–Oct.


Artemisia capillaris var. grandiflora Pampanini; A. capillaris var. grandiflora (Pampanini) Pampanini; A. desertorum Sprengel f. latifolia Pampanini, p.p.; A. japonica Thunberg f. eriopoda (Bunge) Pampanini; A. japonica var. eriopoda (Bunge) Komarov; A. pubescens Ledebour subsp. eriopoda (Bunge) Kitamura.

Artemisia eriopoda var. eriopoda

South man (原变种) nan mu hao (yuan bian zhong)


Forest margins, roadsides, grasslands, shrublands, canyons, forest steppes, steppes, seashore dunes, waste areas, slopes, mountains; near sea level to 2100 m. Anhui, S and SW Gansu, Hebei, Henan, Huei, Hunan, Jiangsu, Liaoning, Nei Mongol, S Shantung, Shanxi, Sichuan, N Yunnan [Japan, Korea, E Mongolia].

1a. Stem more than (40–)50 cm tall; basal leaves broadly ovate, obovate, subobovate, or obovate-attenuate, pinnatifid, distal lobe larger than laterals, or leaves entire, but serrate at apex, middle stem leaves pinnatisect, lobes serrate; capitula in broad, much-branched panicles.

2a. Basal leaves broadly ovate or obovate, 1- or 2-pinnatisect .......... 174a. var. eriopoda

2b. Basal leaves subobovate or obovate-attenuate, entire, partite, or cleft at apex ............ 174c. var. rotundifolia

3a. Leaves nearly succulent, lower leaves pinnatisect, segments regularly 3-cleft apically ........ 174b. var. maritima

3b. Leaves papery, lower leaves pinnatisect, irregularly cleft, serrate, or entire.

4a. Middle stem leaves pinnatisect, segments 2- or 3-cleft ........... 174d. var. gansuensis

4b. Middle stem leaves 1- or 2-pinnatisect, lobes narrowly linear or narrowly linear-lanceolate .......... 174e. var. shanxiensis

\textbf{174a. Artemisia eriopoda var. eriopoda}

南牡蒿

\begin{itemize}
\item Alpine or subalpine steppes, meadows, rocky slopes; 3500–4600 m. Qinghai, W Sichuan, E Xizang.
\item Alpine or subalpine steppes, meadows, rocky slopes; 3700–4200 m. Qinghai, W Sichuan, Xizang.
\end{itemize}

\begin{itemize}
\item Alpine or subalpine steppes, meadows, rocky slopes; 3500–4600 m. Qinghai, W Sichuan, Xizang.
\item Alpine or subalpine steppes, meadows, rocky slopes; 3700–4200 m. Qinghai, W Sichuan, Xizang.
\end{itemize}

\textbf{174b. Artemisia eriopoda var. maritima}

南牡蒿

Forest margins, roadsides, grasslands, shrublands, canyons, forest steppes, steppes, seashore dunes, waste areas, slopes, mountains; near sea level to 2100 m. Anhui, S and SW Gansu, Hebei, Henan, Huei, Hunan, Jiangsu, Liaoning, Nei Mongol, S Shantung, Shanxi, Sichuan, N Yunnan [Japan, Korea, E Mongolia].

\begin{itemize}
\item Stem more than (40–)50 cm tall. Leaves papery, basal leaves broadly ovate to obovate, 1- or 2-pinnatisect, distal lobe larger than laterals, leaves serrate. Synflorescence a broad, much-branched panicle.
\end{itemize}

Forest margins, roadsides, grasslands, shrublands, canyons, forest steppes, steppes; low elevations to 1500 m. Anhui, S and SW Gansu, Hebei, Henan, Huei, Hunan, Jiangsu, Liaoning, Nei Mongol, S Shantung, Shanxi, Sichuan, N Yunnan [Japan, Korea, E Mongolia].

\begin{itemize}
\item Stem 30–40 cm tall; basal leaves divided, distal lobes not larger than other lobes; capitula in ± narrow panicles.
\item Leaves nearly succulent, lower leaves pinnatisect, segments regularly 3-cleft apically .............. 174b. var. maritima
\item Leaves papery, lower leaves pinnatisect, irregularly cleft, serrate, or entire.
\item Middle stem leaves 1- or 2-pinnatisect, lobes narrowly linear or narrowly linear-lanceolate .......... 174e. var. shanxiensis
\end{itemize}

圆叶南牡蒿 yuan ye nan mu hao


Stem 50–80 cm tall. Leaves papery; basal leaves suborbic-ular or obovate-attenuate, entire, cleft, or partite apically. Synflorescence a broad, much-branched panicle.


甘南南牡蒿 gan su nan mu hao

Stem 30–40 cm tall. Leaves papery; basal and middle leaves pinnatisect, distal lobes not larger than other lobes; lobes of basal leaves irregularly serrat e or entire; those of middle leaves 2- or 3-cleft. Synflorescence a somewhat broad panicle.

- Roadsides, waste areas, slopes; low elevations to 2100 m. S and SW Gansu.


狄叶牡蒿 xia ye mu hao

Artemisia japonica Thunberg subf. angustissima (Nakai) Pampanini; A. japonica var. angustissima (Nakai) Kitamura.

Herbs, perennial, 20–60 cm tall, stems few, slender and erect, branching from upper nodes, sparsely arachnoid pilose, ± glabrescent. Lower and middle stem leaves ± sessile; leaf blade ovate or suborbicular in outline, 1.5–2.2 × 1.5–2.2 cm, (1 or)2-pinnatisect; segments 2(or 3) pairs, 5–10 × 3–5 mm, partite or few serrate. Middle stem leaves pinnatisect; lobes linear or narrowly linear-lanceolate, 15–30 × 1–1.5 mm. Synflorescence a narrow panicle.

- Mountains. C Shanxi.


滨海牡蒿 bin hai mu hao

Artemisia japonica Thunberg subsp. littoricola (Kitamura) Kitamura; A. japonica f. resedifolia Takeda; A. japonica f. sachalinensis Pampanini; Oligosporus littoricola (Kitamura) Poljakov.

Herbs, perennial, 30–100 cm tall, gray pubescent or glabrescent. Basal leaves forming a rosette; those of sterile shoots obovate, 5–10 × 3–5 cm, palmately to pinnately lobed. Lowest stem leaves ± sessile; leaf blade broadly ovate, suborbicular, or obovate, 3–5 × 3–5 cm, gray arachnoid pubescent, later glabrescent, deeply palmately lobed or 1(or 2)-pinnatisect to -sect; segments 2(or 3) pairs, linear, 1.5–4 mm wide, base attenuate. Middle stem leaves oblong-attenuate or elliptic-spatulate, 5.5–8 × 4–6 cm, 1- or 2-pinnati- or subpalmatisect or -partite; segments 1 or 2 pairs, serrate or cleft, base attenuate. Uppermost leaves and leaflike bracts elliptic-lanceolate or linear-lanceolate. Synflorescence a broad, conical panicle. Capitula shortly pedunculate. Involute subglobose or broadly ovoid, 2–2.5(–3) mm in diam. Marginal female florets 4(–8–12); corolla 1–1.5 mm. Disk florets bisexual 5–7; corolla 2–2.5 mm, glabrous. Achenes ellipsoid-ovoid. Fl. and fr. Aug–Oct. 2n = 36.

Riverbanks, saline-alkaline soils, in marsh grass. W Heilongjiang, E Nei Mongol [Japan, Korea, E Russia].


东北牡蒿 dong bei mu hao

Artemisia japonica Thunberg var. manshurica Komarov, Fl. Manshur. 3: 625. 1907.

Herbs, perennial, 40–80(–100) cm tall, puberulent or glabrescent. Leaves on sterile branches spatulate or attenuate, 3–7 × 0.5–1.5 cm, apex obtuse, few cleft, or serrate. Lower leaves on fertile stems sessile; leaf blade obovate or obovate-spatulate, 5-partite, or serrate. Middle stem leaves sessile; leaf blade obovate or obovate-elliptic, 2.5–3.5 × 2–3 cm, pubescent or glabrescent, 1(or 2)-pinnati- or subpalmatisect or -partite; segments 1 or 2 pairs, narrowly spatulate or oblan cee, 10–20 × 2–3 mm, 3-cleft or not. Uppermost leaves broadly attenuate or elliptic-ovate; leaflike bracts lanceolate or elliptic-lanceolate. Synflorescence a narrow panicle. Capitula shortly pedunculate. Involute subglobose or broadly ovoid, 1.5–2 mm in diam. Marginal female florets 4–8. Disk florets 6–10, male. Achenes obovoid or ovoid. Fl. and fr. Aug–Oct. 2n = 36.

- Slopes, forest margins, steppes, forest steppes, shrublands, roadsides, canyons; low elevations. N Hebei, S Heilongjiang, Jilin, Liaoning, Nei Mongol.


牡蒿 mu hao

Herbs, perennial, 50–130 cm tall; rootstock 1.5–2.5 cm thick, woody, upper parts puberulent or glabrescent, strongly aromatic. Sterile stems 5–30 cm, leaves clustered at apex; leaf
bladespulate, 3.5–8 × 1–3 cm, pinnately lobed, toothed, apex rounded. Basal and lower stem leaves ± sessile; leaf blade oblong-ovate to broadly spathulate or flabellate, (3–)4–6–(8) × (1–)2–2.5–(3) cm, puberulent or glabrescent, obliquely pinnatipartite or -cleft from apex to center, few serratce apically. Middle stem leaves: leaf blade spathulate, cuneate, or narrowly spathulate, 2.5–3.5–(4.5) × 0.5–1–(2) cm, obliquely partite or cleft and few serratte at apex or lobes linear. Upmost leaves 3-cleft or entire; leaflike bracts elliptic, lanceolate, or linear-lanceolate. Synflorescence a ± narrow panicule, 15–20 × 3–15–(20) cm panicle; branches almost horizontal or obliquely patent, 3–20 cm. Capitula many, nodding, shortly to long pedunculate. Involucre ovoid or subglobose, 1.5–2.5 mm in diam.; phyllaries glabrous, outermost ovate, very narrowly white scarious on margin, apex acute. Florets 12–15–(20), yellow. Marginal female florets 3–8–(11); corolla narrow, 2-toothed. Disk florets 5–10, male. Achenes dark brown, 0.8–1 mm, obovoid.

1a. Middle stem leaf blades spathulate, apex truncate or obtuse, margin few serrate or obliquely cleft from middle to apex, lobes various but not linear .... 178a. var. japonica
1b. Middle stem leaf blades narrowly spathulate, margin not serrate toward apex, obliquely 3–5-partite or -sect, lobes linear ...... 178b. var. hainanensis

178a. Artemisia japonica var. japonica

牡蒿 (原变种) mu hao (yuany bian zhong)

Artemisia cuneifolia Candolle; A. glabrata Wallich ex Besser; A. japonica subf. intermedia Pampanini; A. japonica var. lanata Pampanini; A. japonica f. laxiflora Nakai; A. japonica subf. laxiflora (Nakai) Pampanini, A. japonica var. macrocephala Pampanini; A. japonica var. microcephala Pampanini; A. japonica var. myriocephala Pampanini; A. japonica f. silvestr ii Pampanini; A. japonica subf. spatulata Pampanini; A. japonica f. vestita Pampanini; A. morissonensis Hayata var. minimapampanini; A. subintegra Kitamura; Chrysanthemum japonicum Thunberg; Oligosporus japonicus (Thunberg) Poljakov.

Middle stem leaves spathulate, entire, obtuse or truncate, few serrate at apex or obliquely cleft from apex to center; lobes oblong or elliptic, not narrowly linear.

Forest margins, waste areas, shrublands, hills, slopes, roadsides; low elevations to 3300 m. Anhui, Fujian, S Gansu, Guangdong, Guangxi, Guizhou, S Hebei, Heilongjiang, Henan, Hubei, Hunan, Jiangsu, E and S Liaoning, S Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, E Xizang, Yunnan, Zhejiang [Afghanistan, Bhutan, Japan, Korea, Laos, Myanmar, Sri Lanka].

Artemisia japonica is used in the preparation of antitoxic and antifebrile medicines.

Kun lun hao

Oligosporus nanschanicus (Krascheninnikov) Poljakov.

Herbs, perennial, 10–20(–30) cm tall, with horizontal rhizomes, with short fertile branches, gray or yellowish puberulent or glabrescent, fetid. Lower stem leaves: petiole 0.3–0.6 cm; leaf blade spatulate, obovate, or ovate, 1–2 × 0.5–1 cm, obliquely pinnati-subpalmatipartite or -cleft; lobes elliptic, oblong, or elliptic-lanceolate, 5–10 × 1–2 mm. Middle stem leaves sessile; leaf blade spatulate or obovate-spatulate, obliquely (2 or)3(or 4)-partite, rarely -sect; lobes elliptic or linear, 5–8 × 1(–2) mm. Uppermost leaves and leaflike bracts spatulate, obliquely 2- or 3-partite, -cleft, or entire. Synflorescence a narrow panicle. Capitula shortly pedunculate or sessile. Involucre subglobose, 2–2.5(–3) mm in diam. Marginal female florets 10–15. Disk florets 12–20, male. Achenes oblong or obovoid-oblong. Fl. and fr. Aug–Oct.

- Dry slopes, steppe, rocky terraces or slopes; 2100–5300 m. S Gansu, Qinghai, S Xinjiang, Xizang.


Peng chuo hao

Herbs, perennial, 30–40 cm tall, puberulent. Lower stem leaves: petiole 1.5–2.5 cm; leaf blade ovate or oblong-ovate, 2–2.5 × 2–2.5 cm, puberulent or glabrescent, 2-pinnatisect; segments 2 pairs; lobules linear or linear-lanceolate, 3–4 × 1–1.5 mm, apex acute. Middle and upper stem leaves sessile; leaf blade ovate, 1- or 2-pinnatisect; segments 2 or 3 pairs, linear or linear-lanceolate, 3–4 × 2–2.5 mm, occasionally basal lobes lobulate; leaflike bracts 3–5-sect. Synflorescence a long, narrow panicle. Capitula closely spaced, shortly pedunculate or sessile. Involucre subglobose, 2–2.5(–3) mm in diam. Marginal female florets 3–8. Disk florets 7–15; male. Achenes obvoid or obovoid-oblong. Fl. and fr. Aug–Oct.

- Roadsides; low to middle elevations. W Sichuan.


Niu wei hao

Subshrubs, 80–120(–180) cm tall, much branched; branches 15–35 cm or more, usually flexuous, pubescent or glabrescent. Leaves shortly petiolate to almost sessile, abaxially grayish green arachnoid hairy to subglabrous, adaxially green and white dotted with or without sparse T-shaped hairs. Lowermost leaves ovate or oblong, 5-partite. Middle stem leaves ovate, 5–12 × 3–7(–9) cm, 5-partite; lobes elliptic, oblong-lanceolate, or lanceolate, 30–80 × 5–12 mm, base attenuate. Uppermost leaves ternate, 3-partite; leaflike bracts entire, elliptic-lanceolate or lanceolate. Synflorescence a narrow to broad panicle, 15–30 × 10–20 cm; primary branches ascending to ± patent (upper), to 25 × 2–3 cm. Capitula many, almost sessile. Involucre broadly ovoid or globose, 1.5–2 mm in diam.; outer phyllaries sparsely arachnoid hairy, green, apex acute. Florets 8–20, purplish. Marginal florets 6–8; corolla basally broadened, 2-toothed. Disk florets 2–12, male; corolla tube glandular, apex very sparsely hairy. Achenes brown, oblong or obovoid, 1.25–1.5 mm. Fl. and fr. Aug–Oct. 2n = 34, 54.

Slopes, steppes, riverbanks, roadsides, valleys, canyons, forest margins; low elevations to 3500 m. C and S Gansu, NW Guangxi, Guizhou, Hebei, S Henan, W Hubei, Nei Mongol, Ningxia, Qinghai, Shaanxi, W Shandong, Shanxi, Sichuan, E Xizang, Yunnan [Bhutan, India, Japan, Nepal, Thailand].

1a. Leaves abaxially persistently densely pubescent .......................... 183a. var. dubia

1b. Leaves abaxially glabrescent ...... 183b. var. subdigitata

183a. Artemisia dubia var. dubia

Niu wei hao (yw bia zhong)

Artemisia dracunculus Linnaeus f. thomsonii Pampanini; Artemisia subdigitata Mattfeld var. thomsonii (Pampanini) S. Y. Hu.

Leaf blades abaxially persistently densely pubescent.

Dry slopes, steppes, forest margins, roadsides; low elevations to 3500 m. S Gansu, Nei Mongol, W Sichuan, E Xizang, Yunnan [Bhutan, India, Japan, Nepal, Thailand].


Wu mao niu wei hao


Leaf blades abaxially glabrescent.

Slopes, riverbanks, roadsides, valleys, canyons, forest margins; low elevations to 3000 m. S Gansu, Nei Mongol, W Sichuan, E Xizang, Yunnan [Bhutan, India, Japan, Nepal, Thailand].

“Artemisia wulingshanensis Bar. et Skv.” (Liou, Clav. Pl. Chin. Bor.-Orient. 393. 1959) belongs here but was not validly published because no Latin description or diagnosis, or reference to such, was provided (Vienna Code; Art. 36.1).


Zhi lie hao

Herbs, perennial, or subshrubs, 7–60 cm tall, glabrescent; branches many, to 15 cm. Lower and middle stem leaves ± sessile; leaf blade elliptic, 2–5 × 2–3 cm, abaxially densely adpressed sericeous-pubescent except on veins, adaxially glabrous, ternately 3-partite(-cleft); lobes linear or linear-lanceolate, 20–25 × 2–4 mm, base attenuate, margin revolute. Uppermost leaves and leaflike bracts linear or linear-lanceolate, entire, 30–45 × 1–2.5 mm. Synflorescence ± narrow conical simple panicle; lowermost ultimate branches to 7 cm; bracts linear, often longer than involucre. Capitula mostly widely spaced, sometimes in clusters of 2 or 3; peduncle to 6 mm. In-

- Slopes, grasslands, forest margins; ca. 3800 m. S and W Sichuan, E Xizang.

1a. Stem 20–60 cm tall; middle stem leaves 4–5 cm, lobes 2–2.5 mm wide .................. 184a. var. tridactyla
1b. Stem 7–10 cm tall; middle stem leaves 2–4 cm, lobes 1–2 mm wide .................. 184b. var. minima

184a. Artemisia tridactyla var. tridactyla

184b. Artemisia tridactyla var. minima

Subshrubs, 50–80(–120) cm tall, puberulent or glabrescent; branches 8–14 cm, obliquely ascending. Lowermost leaves ± sessile; leaf blade ovate or ovate-oblong, deeply 3–5-partite or entire; lobes linear-lanceolate or -oblongate. Middle stem leaves: leaf blade elliptic, 2–3 × 0.8–1.5 cm, abaxially densely arachnoid pubescent, adaxially gray pubescent, ternately 3-partite; lobes linear or linear-lanceolate, 10–20 × 1–2 mm, margin revolute. Uppermost leaves and leaflike bracts 3-partite or entire. Synflorescence a lax panicle to 7 cm, lower branches to 3 cm, very slender, with flowering branches from upper nodes forming large compound panicle. Capitula shortly pedunculate or sessile. Involucre broadly ovoid, subglobose, or oblong, ca. 2 × 1.5–2 mm; phyllaries glabrous. Marginal female florets 4–8; corolla limb glabrous. Disk florets 5–7, male. Achenes obovoid. Fl. and fr. Jul–Oct.

- Slopes, grasslands, forest margins; ca. 3800 m. S Sichuan, E Xizang.


华北米蒿 hua bei mi hao (yuán bìan zhòng)

Artemisia giraldii Pampanini; A. dracunculus Linnaeus f. chinensis Pampanini; A. dracunculus f. intermedia Pampanini; A. dracunculus subf. oblonga Pampanini; Oligosporus giraldii (Pampanini) Poljakov.

- Terraces, slopes, dry river valleys, hills, roadsides, forest margins; 1000–1200(–2300) m. Gansu, Hebei, Nei Mongol, Ningxia, Shaanxi, Shansi, NW Sichuan.

185a. Artemisia giraldii var. giraldii

华南米蒿 (原变种) hua bei mi hao (yuán bìan zhòng)

Artemisia giraldii var. giraldii

华北米蒿 var. giraldii

185b. Artemisia giraldii var. longipedunculata

华北米蒿 chang geng mi hao

Artemisia giraldii var. longipedunculata

- Hebei, Nei Mongol.


错那蒿 cuo na hao

Herbs, perennial, 30–80 cm tall, gray puberulent or glabrescent; branches 8–14 cm, ascending. Lower and middle stem leaves sessile; leaf blade elliptic, 5–20 × 1–1.5 cm, abaxially densely arachnoid pubescent, adaxially gray-black when dried, sparsely gray pubescent, 3–7-partite; lobes linear, linear-lanceolate, or elliptic-lanceolate, 5–8(–10) × 1–2(–3) mm, basal lobes unusually lobulate; lobules elliptic. Uppermost leaves and leaflike bracts linear or linear-lanceolate. Synflorescence a ± narrow panicle. Capitula many. Involucre globose or hemispheric, 2–3 mm in diam. Marginal female florets 5–10; corolla limb puberulent. Disk florets 8–15, male. Achenes oblong or obovoid. Fl. and fr. Jul–Oct.

- Waste areas, terraces, rocky slopes; 3000–4000 m. E Xizang.

Artemisia conaensis is used medicinally.

152. SERIPHIDIIUM (Besser ex Lessing) Fourreau, Ann. Soc. Linn. Lyon, sér. 2, 17: 89. 1869.

组蒿属 juan hao shu

Lin Yourun (林有润 Ling You-ruen, Ling Yuou-ruen); Christopher J. Humphries, Michael G. Gilbert

Artemisia subg. Seriphidium Besser ex Lessing, Syn. Gen. Compos. 264. 1832 ["Scriphida"].

Shrubs or herbs, caespitose or solitary in annual herbs, strongly aromatic, sterile branched, tomentose, arachnoid pubescent, or glabrescent. Leaves alternate. Lowermost or middle stem leaves 2- or 3(or 4)-pinna-rotate, -cleft, pectinately sect, or ternately 3-sect; lobes or lobules narrowly linear, or narrowly lanceolate, rarely filiform, elliptic, or pectinate. Uppermost leaves and leaflike bracts divided or entire. Capitula in narrow or broad panicles, rarely spicate panicles, sessile, ellipsoid or oblong, rarely ovoid, ovoid-campan-
ulate, or globose, heterogamous, disciform. Phyllaries in (3 or)4–6(or 7) series, densely pubescent or arachnoid pubescent. Bisexual florets (1–)3–12(–20); anther appendages linear or linear-lanceolate. Achenes ovoid or obovoid, subcompressed.

About 100 species: arid regions of C, S, and SW Asia (including Arabian peninsula), N Africa, Europe; 31 species (six endemic) in China.

Some species contain flavonoids and santonin; some are used for medicine.

Molecular data (Watson et al., BMC Evolutionary Biology; http://www.biomedcentral.com/1471-2148/2/17/; accessed 10 Apr 2011) show that the Old World members of Seriphidium s.s. form a well-defined monophyletic group embedded within Old World Artemisia s.l. The New World members (A. sect. Tridentatae L. M. Schultz) formed a polyphyletic group distributed among New World species of Artemisia and are here excluded from Seriphidium s.s.

1b. Lowermost and middle stem leaves pinnatisect or pinnatifid.

2a. Leaves 2(or 3)-sect, lobules pectinate or narrowly serrate (2. S. sect. Minchunensis) .............................................. 30. S. minchunense
2b. Leaves 1–3(or 4)-pinnatisect, lobules narrowly lanceolate or filiform or leaves entire or lobes with orbicular serrations (1. S. sect. Seriphidium).

3a. Leaves 1- or 2-pinnatisect, lobes or lobules elliptic or ovate-elliptic, less than 5 mm, or leaves pinnatisect, lobes orbicular-serrate, or partly entire.
4a. Middle stem leaves 1(or 2)-pinnatisect, segments 3 or 4 pairs, lobes or lobules elliptic or ovate, occasionally margins 2- or 3-toothed ................................................................. 8. S. scopiforme
4b. Middle stem leaves pinnatifid, segments 10(–15) pairs, orbicularly lobed or leaves linear and entire ........................................ 23. S. santolinum
3b. Leaves 1–3-pinnatisect, lobes 5–8 mm.
5a. Stems caespitose, less than 25 cm tall; capitula densely spaced along branches forming short spicate or compound capitulate synflorescences.
6a. Vegetative parts white tomentose; phyllaries densely gray tomentose ........................................ 25. S. rhodanthum
6b. Vegetative parts gray arachnoid pubescent or pubescent, or sometimes yellowish puberulent, sometimes partly glabrescent; phyllaries pubescent to densely arachnoid pubescent.

7a. Phyllaries gland-dotted ......................................................................................................................... 24. S. borotalense
7b. Phyllaries not gland-dotted.

8a. Vegetative parts yellowish puberulent; leaf blade 0.5–0.8 cm .................................................. 27. S. grenardi
8b. Vegetative parts gray arachnoid tomentose or pubescent; leaf blade 1.5–3.5(–4) cm.

9a. Stems much branched and caespitose; lowermost leaves 1- or 2-pinnatisect, or subpalmately 2- or 3-pinnatisect ................................................................. 26. S. korovinii
9b. Stems less branched, not largely caespitose; lowermost leaves 2- or 3-pinnatisect.

10a. Lowermost leaves ovate, 2- or 3-pinnatisect, segments (3 or)4 or 5(or 6) pairs, lobules 2–3(–4) mm, apex obtuse .......................................................... 28. S. compactum
10b. Lowermost leaves suborbicular, (2 or)3-pinnatisect, segments (2 or)3 or 4 pairs, lobules 3–4 mm, apex acute .............................................. 29. S. lehmannianum

5b. Branches long or short; capitula spreading on branches, in narrow or broad panicles.

11a. Lowermost leaves 2- or 3-pinnatisect; middle stem leaves 1–3-pinnatisect.
11b. Branches less than 3 cm; stem, branches, and leaves arachnoid pubescent, later glabrescent; middle stem leaves with 2–5 pairs of segments; capitula in narrow panicles.

12a. Stems laxly caespitose; stem and branches arachnoid pubescent or glabrescent; middle stem leaves with (3 or)4 or 5 pairs of segments, not gland-dotted; phyllaries convex ......................................................... 6. S. karatavicum
12b. Stems densely caespitose; stem and branches pubescent, later glabrescent; middle stem leaves with 2 or 3 pairs of segments, gland-dotted; phyllaries keeled ......................................................... 17. S. gracilescens

13a. Synflorescence a narrow or somewhat broad panicle; capitula usually in groups of 2 or 3 along branchlets, ovoid-oblong or ellipsoid, ca. 2 mm in diam. .......................................................... 13. S. brevifolium
13b. Synflorescence a broad, much-branched panicle; capitula solitary, subglobose, 2.5–3 mm in diam. .......................................................... 14. S. thomsonianum
14b. Lower and middle stem leaves more than 2.5 cm; branches ascending.
   16a. Stem arachnoid tomentose; lower leaves broadly ovate or ovate-oblong, middle stem leaf lobules 2–4 mm .......................................................... 1. S. schrenkianum
   16b. Stem densely tomentose or pubescent, later partly glabrescent; lower leaves elliptic-ovate or ovate-oblong, middle stem leaf lobules more than 5 mm.

17a. Stem, branches, leaves, and phyllaries arachnoid tomentose or pubescent, but stem and phyllaries glabrescent at anthesis; branches more and spreading; capitula ellipsoid or oblong, in broad or somewhat broad panicles .................................................... 5. S. mongolorum
17b. Stem, branches, leaves, and phyllaries arachnoid pubescent or tomentose, hairs present or glabrescent in lower stem at anthesis; branches from middle to above on stem; capitula oblong, oblong-ovoid, or ovoid, in somewhat broad, elongated, or narrow panicles.

18a. Middle stem leaves (1 or)2-pinnatisect, lobules 1–1.5 mm wide; capitula 2–2.5 mm in diam., in narrow or somewhat broad panicles ........................................................................................ 4. S. finitum
18b. Middle stem leaves 2- or 3-pinnatisect, lobules 0.5–1 mm wide; capitula 1–2 mm in diam., at upper part of stem in somewhat broad panicles.

19a. Rootstock thick, lower bark peeling; middle stem leaves pinnatisect, segments 4 or 5 pairs; phyllaries strongly convex ....................................................................  2. S. transiliense
19b. Root solitary, lower bark not peeling; middle stem leaves (2 or)3-pinnatisect, segments 5 or 6 pairs; phyllaries ± flat ................................................................. 7. S. savanense

11b. Lowermost leaves 1- or 2-pinnatisect, middle stem leaves 1- or 2-pinnatisect.
   20a. Capitula 2–2.5 mm; branches from middle part of stem, spreading, 10–15 cm; panicles broad, conical ................................................................. 16. S. ferganense
   20b. Capitula less than 3 mm in diam.; branches from upper part of stem, less than 10 cm, or if from lower stem then short or more than 10 cm; panicles broad or narrow.

21a. Middle stem leaves pinnatisect, segments 1 or 2(3) pairs; phyllaries and florets deciduous after anthesis ................................................................. 9. S. kaschgaricum
21b. Middle stem leaves 1-pinnatisect, or 2(3)-pinnatisect and then with segments (2 or)3–5; phyllaries and florets persistent after anthesis.

22a. Stems many and thickly caespitose, branches 2–3(5) cm, ascending; lobes and lobules of leaves deciduous or nearly deciduous.
23a. Branches from middle part of stem, ascending; leaves persistent after anthesis; middle stem leaves with 3 or 4 pairs of segments, lobes or lobules needlelike, more than 3 mm, central lobes 4–12 mm.
   24a. Stem 30–45 cm tall, branches 2–4(5) cm; lowermost leaves 2-pinnatisect, middle stem leaves 1- or 2-pinnatisect; capitula in narrow or somewhat broad panicles .......... 21. S. sublessingianum
   24b. Stem 5–25(35) cm tall, branches 1–2(3) cm; lower leaves 1(2)-pinnatisect, middle stem leaves 1(2)-pinnatisect; capitula in narrow, spikelike panicles ........................................ 22. S. amoenum

23b. Branches from upper part of stem, spreading or ascending; leaves deciduous or semideciduous after anthesis; middle stem leaves with 2–5 pairs of segments, central lobes 2–3 mm.
   25a. Stem, branches, and leaves densely tomentose or pubescent; leaves with (3 or)4 or 5 pairs of segments, semideciduous after anthesis; capitula in dense narrow pyramidal panicles .......... 19. S. semiaridum
   25b. Stem, branches, and leaves densely arachnoid tomentose or pubescent; leaves with 3 or 4(5) pairs of segments, deciduous after anthesis; capitula in loose somewhat broad panicles on upper stem.

26a. Branches from upper stem, 2–3(5) cm; lower leaves ovate, 1–2(3) × 0.8–1 cm; capitula in loose somewhat broad panicles ........................................................................ 18. S. terrae-albae

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26b. Branches from upper stem, 5–8 cm; lower leaves ovate-oblong or elliptic-ovate, 2–2.5 × 1–1.5 cm; capitula in somewhat broad and elongated panicles .......................... 20. S. heptapotamicum

22b. Stems few or several, not thickly caespitose; branches more than (3–)5 cm; lobes or lobules not deciduous.

27a. Branches ascending from upper part of stem; middle stem leaves with (3 or)4 or 5 pairs of segments.

28a. Stem, branches, leaves, and phyllaries gray puberulent or glabrescent; capitula in groups of 3–5 along branches ...................... 15. S. aucheri

28b. Stem, branches, leaves, and phyllaries arachnoid pubescent, later partly glabrescent; capitula uniformly distributed along branches .... 3. S. nitrosum

27b. Branches ascending or spreading from middle or lower parts of stem; middle stem leaves with (2 or)3 or 4 pairs of segments.

29a. Lowermost leaves 3–6 × 1.5–4.5 cm; capitula in dense narrow panicles ................................................................................................. 12. S. cinum

29b. Lowermost leaves 1–3 × 0.5–2(–2.5) mm; capitula in sparse narrow panicles.

30a. Branches spreading from lower stem; capitula in somewhat broad or narrow panicles ................................. 11. S. issykulense

30b. Branches ascending from middle of stem; capitula in narrow elongated panicles .................................... 10. S. fedtschenkoanum

1. Seriphidium sect. Seriphidium

绢蒿组 juan hao zu

Herbs, perennial, or subshrubs, tomentose or glabrescent. Leaves 1–3(or 4)-pinnatisect, -partite, or entire.

About 85 species: arid regions of C, S, and SW Asia, N Africa, C, E, S, and W Europe; 29 species (five endemic) in China.


草原绢蒿 cao yuan juan hao

_Artemisia schrenkiana_ Ledebour, Fl. Ross. 2: 575. 1845.

Herbs, perennial, with a strong stock, 30–50(–60) cm tall, densely gray and arachnoid tomentose. Lowermost leaves: petiole 2–4 cm; leaf blade broadly ovate or ovate-oblong, 3–6 × 1.5–2.5 cm, arachnoid tomentose, 2- or 3-pinnatisect; segments 4 or 5(or 6) pairs; lobules 2–6 × 1–1.5 mm, obtuse apically. Middle stem leaves 2-pinnatisect. Uppermost leaves and leaf-like bracts pinnatisect. Synflorescence a broad or somewhat broad panicle. Involucre oblong-or ellipsoid-oblong, 1.5–2(–2.5) mm in diam.; phyllaries densely gray tomentose. Florets 5 or 6. Achenes ovoid or obovoid. Fl. and fr. Aug–Oct.

Desert steppes, steppes, meadow steppes, waste areas, riverbanks, lakeshores, terraces, canyons, saline-alkaline soils, dunes; 100–1000 m. E Xinjiang [Kazakhstan, Mongolia, Russia].


伊犁绢蒿 yi li juan hao


Subshrubs, with a thick rootstock, 40–80 cm tall, densely gray or greenish arachnoid tomentose, later glabrescent, lower bark brown, usually peeling off. Lowermost leaves: petiole 2–3.5 cm; leaf blade oblong, 3.5–6 × 2.5–5 cm, gray arachnoid pubescent, 2(or 3)-pinnatisect; segments 4 or 5(or 6) pairs; lobules narrowly linear or narrowly linear-lanceolate, 4–8 × 0.5–1 mm, mucronulate apically. Middle stem leaves 1- or 2-pinnatisect. Upper leaves pinnatisect; leaflike bracts linear, entire. Synflorescence a dense, narrow, elongated panicle. Capitula ± sessile. Involucre oblong-ellipsoid or oblong, 1–2 mm in diam.; phyllaries strongly convex, densely pubescent. Florets 3–5; corolla limb red or yellow. Achenes ovoid. Fl. and fr. Aug–Oct.

Slopes, canyons, rocky hills, riverbanks, steppes, roadsides; low to middle elevations. N Xinjiang [Kazakhstan].


西北绢蒿 xi bei juan hao

Herbs, perennial, or subshrubs, arachnoid pubescent or partly glabrescent; flowering stems 5–50 cm tall; root solitary; upper parts with spreading branches. Lower leaves 3–7 cm overall: petiole long; leaf blade ovate-oblong or elliptic-lanceolate, 30–40 × 5–20 mm, (1 or)2-pinnatisect; segments 4 or 5 pairs; lobules narrowly linear, 3–5 × 0.3–0.8 mm. Middle stem leaves 1- or 2-pinnatisect. Upper leaves pinnatisect; leaflike bracts linear, entire, rarely pinnatisect. Synflorescence a somewhat broad to slender, cylindric panicle. Capitula remote or grouped along branches, sessile. Involucre cylindric or ovoid-cylindric, 1.5–2 mm in diam.; phyllaries densely arachnoid pubescent, later sparsely pubescent or glabrescent. Florets 3–6; corolla purple-pink or yellow. Achenes ovoid. Fl. and fr. Aug–Oct.

Desert or semidesert steppes, Gobi Desert, rocky slopes, dry canyons, dry riverbanks, roadsides, terraces, saline-alkaline soils; low ele-


- Rocky slopes, semidesert steppes, riverbanks, lakeshores, meadows. E Nei Mongol.


9a. Seriphidium kaschgaricum var. kaschgaricum


Subshrubs or shrubs, 15–35(–45) cm tall, gray arachnoid pubescent, later glabrescent. Lower stem leaves: petiole 3–5 mm; leaf blade ovate, 1.5–2.5 × 1–2 cm, 2- or 3-pinnatisect; segments 2–4 pairs; lobules linear, 2–4 mm. Middle stem leaves 2-pinnatisect. Upper leaves and leaflike bracts pinnatisect or entire. Synflorescence a narrow or somewhat broad panicle. Capitula usually 2 or 3 together along branchlets. Involucre ovoid-oblong or ellipsoid, ca. 2 mm in diam.; phyllaries densely pubescent. Florets 3 or 4(–8). Achenes oblong-ovoid or ovoid-ellipsoid. Fl. and fr. Aug–Oct.

Slopes, valleys, saline-alkaline soils; 2700–4500 m. W Xizang [Afghanistan, N India, N Pakistan].


Subshrubs or shrubs, 30–80 cm tall, gray arachnoid pubescent, lower glabrescent. Lower stem leaves: petiole 6–1.5–4.5 cm, 2( or 3)-pinnatisect; segments 3 or 4 pairs; lobules narrowly linear-lanceolate, 2–5 × 0.3–0.8 mm, mucronulate apically. Middle stem and uppermost leaves pinnatisect; leaflike bracts narrowly linear. Synflorescence a narrow panicle. Capitula ± dense. Involucre ellipsoid-ovoid or ovoid-oblong, ca. 2 mm in diam.; phyllaries glabrescent. Florets 3–5. Achenes obvoid or ovoidobovoid. Fl. and fr. Aug–Oct.

Cultivated. N Gansu, N Shaanxi, Xinjiang [Kazakhstan].

Mexican mintic drug.

Seriphidium cinum is a source of α-santonin, used as an anthelmintic drug.


Subshrubs or shrubs, 15–35(–45) cm tall, gray pubescent, later glabrescent. Lower stem leaves: petiole 3–5 mm; leaf blade 1–1.5 cm; leaf blade oblong, densely tomentose, 2-pinnatisect; segments 3 or 4 pairs; lobules narrow linear, (3–)6–9(–12) × 0.5–1(–1.5) mm, acute apically. Middle stem and upper leaves pinnatisect; leaflike bracts linear. Capitula in broad pyramidal paniculate synflorescences. Involucre obvoid-ellipsoid, 2–2.5 mm; phyllaries pubescent. Florets 5–6. Achenes oblong-ovoid or ovoid-ellipsoid. Fl. and fr. Aug–Oct.

Desert margins, saline-alkaline soils, desert steppes, rocky slopes and canyons; low to middle elevations. SW Xinjiang [Kazakhstan, Kyrgyzstan].


Subshrubs, 30–40 cm tall, gray pubescent, later glabrescent. Lower and middle stem leaves: petiole 5–10 mm; leaf blade ovate, 2–3 × 1–2 cm, pubescent, later glabrescent, 2-pinnatisect; segments 3 or 4( or 5) pairs; lobules linear, 5–10(–15) mm. Upper leaves pinnatisect; leaflike bracts narrowly linear, entire, rarely 3- or 5-lobed. Synflorescence a broad or somewhat broad and elongated panicle. Capitula usually in groups of 3–5 along branchlets. Involucre oblong, 1.5–2 mm in diam.; phyllaries puberulent, later glabrescent. Florets 3–5. Achenes oblong-ovoid or ovoidobovoid. Fl. and fr. Aug–Oct.

Slopes, canyons, roadsides; 2400–3700 m. W Xizang [Afghanistan, Pakistan; SW Asia (Iran)].


Herbs, perennials, 40–50 cm tall, densely gray tomentose, later partly glabrescent. Lowermost leaves: petiole 1–1.5 cm; leaf blade oblong, densely tomentose, 2-pinnatisect; segments 3 or 4 pairs; lobules narrowly linear, 1.5–3(–5)/mm, acute apically. Middle and upper leaves pinnatisect; leaflike bracts linear. Capitula in narrow pyramidal paniculate synflorescences. Involucre obvoid-ellipsoid, 2–2.5 mm; phyllaries pubescent. Florets 5–6. Achenes oblong-ovoid or ovoid-ellipsoid. Fl. and fr. Aug–Oct.

Desert margins, saline-alkaline soils, desert steppes, rocky slopes and canyons; low to middle elevations. SW Xinjiang [Kazakhstan, Kyrgyzstan].


Subshrubs, 15–30 cm tall, with a thick rootstock, gray pubescent, later glabrescent. Lower stem leaves: petiole 3–5 mm; leaf blade triangular-ovate, 1–2 × 0.6–1 cm, gray pubescent and gland-dotted, 2- or 3-pinnatisect; segments 2 or 3 pairs, 3-lobed; lobules narrowly linear. Middle stem leaves ovate-oblong, 1- or 2-pinnatisect. Upper leaves oblong-ovate, 1- or 2-pinnatisect; leaflike bracts narrowly linear, entire. Synflorescence a narrow conical panicle. Involucre oblong or ellipsoid, 1–1.5 mm in diam.; phyllaries keeled, gland-dotted and puberulent or later sparsely puberulent. Florets 2–5. Achenes oblong. Fl. and fr. Aug–Oct.

Subshrubs, 15–30 cm tall, with a thick rootstock, gray pubescent, later glabrescent. Lower stem leaves: petiole 3–5 mm; leaf blade triangular-ovate, 1–2 × 0.6–1 cm, gray pubescent and gland-dotted, 2- or 3-pinnatisect; segments 2 or 3 pairs, 3-lobed; lobules narrowly linear. Middle stem leaves ovate-oblong, 1- or 2-pinnatisect. Upper leaves oblong-ovate, 1- or 2-pinnatisect; leaflike bracts narrowly linear, entire. Synflorescence a narrow conical panicle. Involucre oblong or ellipsoid, 1–1.5 mm in diam.; phyllaries keeled, gland-dotted and puberulent or later sparsely puberulent. Florets 2–5. Achenes oblong. Fl. and fr. Aug–Oct.

Desert margins, saline-alkaline soils, desert steppes, rocky slopes and canyons; low to middle elevations. SW Xinjiang [Kazakhstan, Kyrgyzstan].


Subshrubs, 15–30 cm tall, with a thick rootstock, gray pubescent, later glabrescent. Lower stem leaves: petiole 3–5 mm; leaf blade triangular-ovate, 1–2 × 0.6–1 cm, gray pubescent and gland-dotted, 2- or 3-pinnatisect; segments 2 or 3 pairs, 3-lobed; lobules narrowly linear. Middle stem leaves ovate-oblong, 1- or 2-pinnatisect. Upper leaves oblong-ovate, 1- or 2-pinnatisect; leaflike bracts narrowly linear, entire. Synflorescence a narrow conical panicle. Involucre oblong or ellipsoid, 1–1.5 mm in diam.; phyllaries keeled, gland-dotted and puberulent or later sparsely puberulent. Florets 2–5. Achenes oblong. Fl. and fr. Aug–Oct.

Desert margins, saline-alkaline soils, desert steppes, rocky slopes and canyons; low to middle elevations. SW Xinjiang [Kazakhstan, Kyrgyzstan].


Rocky slopes, Gobi Desert, dry canyons, terraces, roadsides, semi-desert or desert steppes, saline-alkaline soils; 800–2300 m. N Xinjiang [Kazakhstan, Mongolia, Russia].

Artemisia terrae-albae Krascheninnikov, Otchet Rabotakh

Herbs perennial, 8–15(–30) cm tall, with a thick rootstock, densely white arachnoid tomentose, sometimes partly glabrescent. Lower stem leaves: petiole short; leaf blade ovate-elliptic, 1–2×(–3) × 0.8–1 cm, 1- or 2-pinnatisect; segments 3 or 4 pairs; lobules linear, 2–3 × 0.3–0.5 mm. Middle and upper stem leaves pinnatisect; leaflike bracts linear. Synflorescence a lax, somewhat broad panicle. Involucre oblong-ovoid or ovoid, 1.5–3 mm in diam.; phyllaries keeled, white arachnoid pubescent. Florets 3 or 4. Achenes ovoid or obovoid. Fl. and fr. Aug–Oct.

Dunes, desert margins, Gobi Desert; low or middle elevations. N Xinjiang [Kazakhstan, Mongolia].


半倒垂绢蒿 zhan di xun hao


Herbs, perennial, 20–30 cm tall, densely gray tomentose, later partly glabrescent. Lower stem leaves: petiole 3–10 mm; leaf blade ovate-elliptic, 1–2×(–3) × 1–1.5 cm, 1- or 2-pinnatisect; segments (3 or)4 or 5 pairs; lobules linear or linear-lanceolate, 2–4 × 0.3–0.5 mm. Middle stem and uppermost leaves sessile, 1(or 2)-pinnatisect with palmatisect, sometimes pinnatisect, auricles; leaflike bracts pinnatisect or 3- or 5-lobed, or entire. Capitula sessile, in narrow or somewhat broad and elongated panicles. Involucre cylindrical-ovoid or ellipsoid-ovoid, 3–4 × 1–2 mm; phyllaries gray tomentose, later glabrescent. Florets 2–7(–8). Achenes ovoid or obvoid. Fl. and fr. Aug–Oct.

Desert and semidesert steppes, saline-alkaline soils; low to middle elevations. N Xinjiang [Kazakhstan, Mongolia].


半荒漠绢蒿 xian huo mo juan hao


Herbs, perennial, 20–35(–40) cm tall, with a thick rootstock, densely gray arachnoid tomentose, later partly glabrescent. Lower and middle stem leaves: petiole short; leaf blade oblong-ovate or ovate-elliptic, 2–2.5 × 1–1.5 cm, 2-pinnatisect (1(or 2)-pinnatisect in middle leaves); segments 3 or 4(or 5) pairs; lobules linear, 3–5 × 0.3–0.5 mm, acute apically. Upper leaves and leaflike bracts pinnatisect or entire. Synflorescence a somewhat broad and elongated panicle. Involucre oblong or ovoid, 1.5–2.5 mm in diam.; phyllaries sparsely arachnoid pubescent. Florets 3 or 4. Achenes ovoid or obvoid. Fl. and fr. Aug–Oct.

Semidesert and desert steppes; 800–1300 m. N Xinjiang [Kazakhstan].


针裂叶绢蒿 zhen lie ye juan hao


Subshrubs, 30–45 cm tall, gray arachnoid puberulent; nonflowering stems developing fibrous brownish bark. Lowermost leaves: petiole 1–2×(–2.5) cm; leaf blade oblong-ovate or ovate, 3–4 × 1–2 cm, 2-pinnatisect; segments 3 or 4(or 5) pairs; lobules narrowly linear, 5–12 × 0.3–0.5 mm, subcuminate. Middle stem and uppermost leaves sessile, 1(or 2)-pinnatisect with palmatisect, sometimes pinnatisect, auricles; leaflike bracts pinnatisect or 3- or 5-lobed, or entire. Capitula sessile, in narrow or somewhat broad and elongated panicles. Involucre cylindrical-ovoid or ellipsoid-ovoid, 3–4 × 1–2 mm; phyllaries gray tomentose, later glabrescent. Florets 2–7(–8). Achenes ovoid or obvoid. Fl. and fr. Aug–Oct.

Rocky slopes, Gobi Desert, dry valleys, semidesert steppes, dunes; 800–1300 m. N Xinjiang [Kazakhstan, Mongolia, Russia].

Poljakov (Fl. URSS 26: 596–597. 1961) recognized two further varieties of Artemisia sublessingiana: var. gorjaevii, with slender erect stems usually 20–30 cm tall and short narrowly linear leaf lobes, and var. polysticha, with lower stem leaves not more than 2 cm and often 3 stigmatic lobes.

“Artemisia maritima Linnaeus [var.] sublessingiana” (Keller, Bot.-Geogr. Issledov. Zaisansk. Semipalatinsk. Obl. 2: 89. 1912) belongs here but is a nomen nudum and was therefore not validly published (Vienna Code, Art. 32.1(d)).


小针裂叶绢蒿 xiao zhen lie ye juan hao


Subshrubs, 5–25(–35) cm tall, with a thick rootstock, gray arachnoid pubescent, later glabrescent. Lower stem leaves: petiole short; leaf blade oblong-ovate or oblong-ovate, 4–8 × 1.5–2(–2.5) cm, 1(or 2)-pinnatisect; segments 3 or 4(or 5) pairs, occasionally middle of lateral lobes 3-lobed; lobules or lobes narrowly linear or narrowly linear-lanceolate, 4–12 × 1–2.5 mm, mucronulate apically. Middle stem leaves pinnatisect; lobes narrowly linear. Upper leaves and leaflike bracts narrowly linear, 4–5 mm. Synflorescence a narrow spike-like panicle. Involucre oblong-ovoid or oblong, 1.5–2 mm in diam.; phyllaries cyst-form, gray pubescent. Florets 4 or 5. Achenes ovoid or obvoid. Fl. and fr. Aug–Oct.

Rocky slopes, Gobi Desert, saline-alkaline soils; low elevations to 1500 m. N Xinjiang.

Seriphidium amoenum contains the anthelmintic α-santonin.

绢蒿 sha mo juan hao


Subshrubs, 25–35(–45) cm tall, with a thick rootstock, densely gray tomentose, later glabrescent. Lower and middle stem leaves sessile; leaf blade elliptic-linear or broadly linear, 1–7 × 0.5–1.5 mm, pinnatifid; segments 10(–15) pairs, small, suborbicular or oblong, or orbiculary 2–3-lobed. Upper leaves and leaflike bracts entire. Synflorescence a broad lax panicle. Involucre ovoid or ovoid-oblong, 2–3.5 mm in diam.; phyllaries densely gray puberulent. Florets 3 or 4. Achenes ovoid or obovoid. Fl. and fr. Aug–Oct.

Desert dunes; below 1400 m. N Xinjiang [Kazakhstan; SW Asia (Caucasus, Iran)].


博络塔绢蒿 bo luo ta juan hao


Herbs, perennial, 12–20 cm tall, with a thick rootstock, gray arachnoid tomentose. Lower stem leaves: petiole 5–8 mm; leaf blade elliptic, 1–2(–3) × 0.8–1.5(–2) cm, densely gray tomentose, 2-pinnatisect; segments (3 or)4 or 5 pairs; lobules or lobes lanceolate or elliptic-lanceolate, 2–3 mm. Middle stem leaves pinnatisect. Upper leaves and leaflike bracts narrowly linear, entire. Synflorescence a narrow spikelike panicle. Involucre oblong-ovoid, 1.5–2 mm in diam.; phyllaries densely arachnoid pubescent, gland-dotted. Florets 5–7. Achenes obovoid or obovoid-ellipsoidal. Fl. and fr. Aug–Oct.

- Gobi Desert, desert and semidesert steppes, rocky slopes, terraces; 1000–1500 m. N Xinjiang.


高山绢蒿 gao yuan juan hao


Herbs, perennial, 4–15(–20) cm tall, with a thick rootstock and capitulate branches, densely white tomentose. Lower stem leaves: petiole 5–10 mm; leaf blade suborbicular or ovate, densely incanous tomentose, 2(or 3)-pinnati- or subpalmatisect; segments 3 or 4(or 5) pairs; lobules linear, 2–3 mm. Middle stem leaves shortly petiolate, 2-pinnatisect. Upper leaves pinnatisect; leaflike bracts linear or elliptic, entire. Synflorescence a narrow, spikelike panicle. Involucre ovoid or ovoid-oblong, 1.5–2(–2.5) mm in diam.; phyllaries densely gray tomentose. Florets 5–7; corolla limb red. Achenes ovoid or obovoid. Fl. and fr. Aug–Oct.

Rocky slopes, steppes, terraces; (1500–)2100–3700 m. SW Xinjiang [Kazakhstan, Kyrgyzstan, Tajikistan].


昆仑绢蒿 kun lun juan hao


Herbs, perennial, 15–25 cm tall, with a thick rootstock, gray pubescent, later glabrescent. Lower stem leaves: petirole short; leaf blade ovate, 1.25–0.5–1 cm, pubescent, 1- or 2-pinnatisect; segments 2(or 3) pairs, 3-lobulated or not; lobes or lobules linear, elliptic, or elliptic-lanceolate, 1.5–3 mm. Middle stem leaves pinnatisect. Upper leaves and leaflike bracts linear, elliptic-lanceolate, or elliptic, entire. Synflorescence a narrow spikelike panicle. Involucre ovoid or ovoid-oblong, 2–2.5(–3) mm in diam.; phyllaries puberulent, gland-dotted. Florets 4 or 5; corolla limb yellow or red. Achenes ovoid or obovoid. Fl. and fr. Aug–Oct.

Gobi Desert, rocky slopes, semidesert steppes; 2000–3000 m. S Xinjiang [Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan].


高原绢蒿 gao yuan juan hao


Subshrubs, 15–20 cm tall, yellowish puberulent. Lower and middle stem leaves: petiole 5–10 mm; leaf blade ovate or oblong, 0.5–0.8 × 0.3–0.5 cm, (1 or)2-pinnatisect; segments 3 or 4 pairs; lobules or lobes lanceolate or elliptic-lanceolate, 2–3 × 0.5–1 mm. Upper leaves and leaflike bracts pinnatisect, 3-lobed or entire. Synflorescence a narrow spikelike panicle. Involucre ovoid or subglobose, 2–3 mm in diam.; phyllaries yellowish puberulent. Florets 4–6. Achenes obovoid. Fl. and fr. Aug–Oct.

- High mountains. S Xinjiang.


紧凑绢蒿 ju tou juan hao


Herbs, perennial or subshrubs, 15–40 cm tall, with a rootstock, gray arachnoid tomentose, later glabrescent. Lower stem leaves: petiole 5–10 mm; leaf blade ovate, 1.5–3.5(–4) × 1–2(–3) cm, arachnoid pubescent, later glabrescent, 2- or 3-pinnatisect; segments (3 or)4 or 5(or 6) pairs; lobules linear, 2–3(–4) × 0.5–1 mm, obtuse apically. Middle stem leaves 1- or 2-pinnatisect. Upper leaves pinnatisect or 3–5-lobed; leaf-

Rocky slopes, semideserts, from low elevations to subalpine areas. W Gansu, W Nei Mongol, Ningxia, NE Qinghai, Xinjiang [Kazakhstan, Mongolia, Russia].


球序绢蒿 qiu xu juan hao


Subshrubs, 15–40(–50) cm tall, with many short sterile branches, densely arachnoid pubescent, later glabrescent. Lower stem leaves: petiole 10–20 mm; leaf blade suborbicular, 1.5–2.5(–3) × 1.5–2.5(–3) cm, (2 or)3-pinnatisect; segments (2 or)3 or 4 pairs; lobules linear, 3–4 × 0.5–0.8 mm. Middle stem leaves 2-pinnatisect; lobules short, narrow to linear. Upper leaves 1(or 2)-pinnatisect; leaflike bracts divided or entire. Synflorescence a very narrow panicle; branches very short with densely crowded capitula. Involucre ovoid-oblong or ovoid, 1.5–2.5 mm in diam.; phyllaries sparsely arachnoid pubescent. Florets 4–8; corolla limb red. Achenes obovoid or obovoid. Fl. and fr. Aug–Oct.

Rocky slopes, canyons, roadsides; 1800–2400 m. N Xinjiang [Afghanistan, India, Kazakhstan; SW Asia (Iran)].


民勤绢蒿组 min qin juan hao zu

Perennial herbs, arachnoid tomentose. Leaves pectinately 2(or 3)-pinnatisect; lobules serrate or subserrate, arachnoid pubescent or glabrescent.

● One species: China.


民勤绢蒿 min qin juan hao

Herbs, perennial, 30–50 cm tall, densely gray arachnoid tomentose, later partly glabrescent or sparsely tomentose. Lower stem leaves: petiole 5–8 mm; leaf blade ovate, densely arachnoid pubescent, later sparsely pubescent, 2(or 3)-pectinately pinnatisect; segments 3(or 4) pairs; lobules 10–25 × 0.5–1 mm, serrate or pectinate, obtuse apically. Middle stem leaves: petiole 5–15 mm; leaf blade ternately 3-lobed; lobes linear-lanceolate or linear, 10–15 × 2–4 mm. Upper leaves and leaflike bracts pinnatisect or 3-lobed. Synflorescence a lax, broad conical panicle; branches at ca. 90° to main stem. Involucre oblong or oblong-campanulate, 2–2.5 mm in diam.; phyllaries arachnoid puberulent. Florets 5–8. Achenes obovoid or oblong-ovoid. Fl. and fr. Aug–Oct.

● Rocky terraces; 1300–1400 m. C and W Gansu, E Xinjiang.


三裂叶绢蒿组 san lie ye juan hao zu


Subshrubs or shrubs, tomentose or pubescent. Leaves 1- or 2-ternate.

Thirteen species: N Africa, Asia, Europe; one species in China.


三裂叶绢蒿 san lie ye juan hao


Leaves 2.5–4 cm; distal lobes 10–15 mm; involucre 2.5–3(–3.5) mm in diam. .......................... 31a. var. junceum

1a. Leaf blade 2.5–4 cm, distal lobes 10–15 mm; involucre 2.5–3(–3.5) mm in diam. .......................... 31a. var. junceum

1b. Leaf blade 1.5–2 cm, distal lobes 4–6 mm; involucre 3–4 mm in diam. .......................... 31b. var. macrosciadium

31b. Seriphidium junceum var. macrosciadium

三裂叶绢蒿(原变种) san lie ye juan hao (yuan bian zhong)


Leaves 2.5–4 cm; distal lobes 1–1.5 cm. Involucre 2.5–3(–3.5) mm in diam.; phyllaries densely or sparsely pubescent.

Rocky slopes, Gobi Desert, desert steppes; 800–1500 m. N Xinjiang [Kazakhstan].

大头三裂叶绢蒿 da tou san lie ye juan hao


Leaves 1.5–2 cm; distal lobes 4–6 mm. Involucre 3–4 mm in diam.; phyllaries densely pubescent.

Rocky slopes, Gobi Desert, desert steppes; 800–1500 m. N Xinjiang [Kazakhstan].


芙蓉菊属 fu rong ju shu

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

Subshrubs, pubescent. Leaves alternate, narrowly spatulate or oblanceolate, apically few lobed or entire. Capitula disciform, heterogamous, many, in a frondose raceme or panicle. Involucres hemispheric; phyllaries in 3 rows, outer ones herbaceous, inner ones broadly scarious at margin. Receptacle ephalate. Marginal female florets in 1 row, tubular, 2- or 3-denticulate, gland-dotted outside. Disk florets tubular, 5-lobed, gland-dotted outside. Anther obtuse at base, with apical oblong appendage; style branches linear, apex truncate. Achenes obovoid, weakly 5-ribbed. Pappus coroniform, of small scales.

One species: China, Japan.

Molecular data (Watson et al., BMC Evolutionary Biology; http://www.biomedcentral.com/1471-2148/2/17; accessed 10 Apr 2011) suggests that Crossostephium is embedded within Artemisia.


芙蓉菊 fu rong ju

Artemisia chinensis Linnaeus, Sp. Pl. 2: 849. 1753; Chrysanthemum artemisioides (Lessing) Kitamura; Crossostephium artemisioides Lessing; Tanacetum chinense (Linnaeus) A. Gray ex Maximowicz.

Plants 10–40 cm tall, much branched in upper part, densely gray-white pubescent. Leaves sessile, aggregated at apex of branches; leaf blade narrowly spatulate or narrowly lanceolate, 2–4 × 0.4–0.5 cm, both surfaces densely gray-white pubescent, base cuneate-attenuate, margin entire or sometimes apex 3- or 4-lobed, thick. Capitula rather small, disciform, ca. 7 mm in diam., many, in a frondose raceme along branches. Involucres hemispheric; phyllaries in 3 rows, outer and middle ones equal, elliptic, herbaceous, abaxially densely gray-white pubescent, apex obtuse or acute, inner ones oblong, small, abaxially sub-glabrous, margin broadly scarious. Marginal female florets in 1 row, tubular, ca. 1.5 mm, gland-dotted outside, apex 2- or 3-denticulate. Disk florets many, tubular, densely gland-dotted outside, 5-lobed. Pappus ca. 0.5 mm, coroniform, of small scales. Fl. and fr. year-round.

Littoral plant found on raised coral outcrops. Fujian, Guangdong, Taiwan, Yunnan, Zhejiang [Japan].

Crossostephium chinensis is rare and possibly threatened in the wild but is often cultivated for ornamental and medicinal purposes. The whole plant is used medicinally for treating infantile convulsions.


线叶菊属 xian ye ju shu

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert


One species: China, Japan, Korea, Mongolia, Russia (Siberia).

Molecular data (Watson et al., BMC Evolutionary Biology; http://www.biomedcentral.com/1471-2148/2/17; accessed 10 Apr 2011) place Filifolium as the sister group to Artemisia subg. Dracunculus (Besser) Rydberg.


线叶菊 xian ye ju

Tanacetum sibiricum Linnaeus, Sp. Pl. 2: 1844. 1753; Artemisia sibirica (Linnaeus) Maximowicz; Chrysanthemum trinoides Handel-Mazzetti.

Herbs, perennial, 20–60 cm tall, roots robust, woody; base densely clothed by old fibrous leaf sheaths; stems solitary or few and tightly clustered, corymbose branched in upper parts, striate, glabrous. Basal leaves long petiolate; leaf blade oblanceolate or oblong in outline, ca. 20 × 5–6 cm, 2(or 3)-pinnatisect, both surfaces green, glabrous; primary lateral segments many paired; ultimate segments filiform, alternate. Synflorescence a flat-

**栉叶蒿属** *zhi ye hao shu*

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

Herbs, annual or perennial. Leaves alternate, pectinate to pinnatisect. Synflorescence of short axillary spikes grouped into a slender, leafy panicle. Capitula rather small, heterogamous, disciform. Involucre ovoid or broadly ovoid; receptacle narrowly conical, epealeate. Marginal florets usually 3 or 4, male, fertile; corolla narrowly tubular, apex not toothed. Disk florets of two kinds; outer bisexual, inner completely male with reduced ovaries; all central florets with corolla apex 5-lobed. Anther bases obtuse; apical appendage rhomboid-acuminate. Style branches linear. Achenes in a row around base of receptacle, ellipsoid, somewhat compressed or triquetrous, brown, striate. Corona absent.

One species: China, Kazakhstan, Mongolia, Russia.

Molecular data (Watson et al., BMC Evolutionary Biology; http://www.biomedcentral.com/1471-2148/2/17; accessed 10 Apr 2011) indicate that *Neopallasia* is closely related to *Seriphidium s.s.* and could be included with that genus within a more broadly conceived *Artemisia*.


**栉叶蒿** *zhi ye hao*  

*Artemisia pectinata* Pallas, Reise Russ. Reich. 3: 755. 1776; *A. pectinata* var. *yunnanensis* Pampanini; *A. yunnanensis* (Pampanini) Krascheninnikov (1958), not Jeffrey ex Diels (Jun 1912), nor H. Léveillé (Nov 1912); *Neopallasia tibetica* Y. R. Ling; *N. yunnanensis* (Pampanini) Y. R. Ling.

Herbs, 12–40 cm tall; stems erect, unbranched or branched from base, purplish, ± densely white sericeous. Lower and middle stem leaves sessile; leaf blade oblong-elliptic, 1.5–3 × 0.5–1 cm, both surfaces green, glabrous, sometimes with sessile glands, pectinately pinnatisect; segments linear-subulate, somewhat rigid. Upper stem leaves to below synflorescence similar, but smaller. Synflorescence of short axillary spikes grouped into a slender, leafy panicle. Capitula many, rather small, sessile. Involucre ovoid or broadly ovoid, 2.5–3 mm in diam.; phyllaries in 3 or 4 rows, abaxially glabrous, scarios margins broad, outer ones somewhat short, inner ones rather narrow. Marginal female florets 3 or 4, female, fertile, narrowly tubular, without apical teeth. Disk florets tubular, 5-lobed, of two kinds: outer bisexual, inner completely male with reduced ovaries. Achenes brown, elliptic, 1.2–1.5 mm, somewhat compressed.

Deserts, gravelly places of river valleys, wastelands; 1300–3400 m. Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shanxi, Sichuan, Xinjiang, Xizang [Kazakhstan, Mongolia, Russia].

*Neopallasia pectinata* is a highly variable species, and the Chinese entities *N. tibetica* and *N. yunnanensis* seem best treated as synonymous with it.

156. **ALLARDIA** Decaisne in Jacquemont, Voy. Inde 4(Bot.): 87. 1841.

**扁毛菊属** *bian mao ju shu*

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

*Waldheimia* Karelin & Kirilov.

Herbs, perennial, glabrous to densely tomentose. Leaves alternate, closely spaced, sometimes rosulate, spatulate or cuneate, apex 3–5-lobed or -parted, or oblong, pinnatisect or pinnatifid. Capitula solitary, pedunculate, heterogamous, radiate. Involucre hemispheric; phyllaries in 3 or 4 rows, scarios margins dark brown. Receptacle convex, epealeate. Marginal florets in 1 row, female or neuter, usually sterile; lamina pink, white, or bluish violet. Disk florets many, yellow or bluish violet, bisexual, fertile; corolla tubular, apex 5-lobed. Anther bases obtuse, apical appendage ovate-lanceolate. Style branches linear, apex truncate. Achenes somewhat curved, faintly 5–10-ribbed, generally with sessile glands, sometimes pilose. Corona of 20–50 bristlelike scales, with flat and palmate base, apex brownish, sometimes wider.

Eight species: Afghanistan, China, India, Kazakhstan, Mongolia, Nepal, Pakistan, Russia, Tajikistan, Uzbekistan; eight species (one endemic) in China.

The exact date of publication of *Allardia* is uncertain, but such evidence as there is (Zain-ul-Abidin, Biologia 4: 212–214. 1958) suggests that it was in 1841, thus predating *Waldheimia*, which was published in 1842.
1a. Leaves 4–5 cm; blade oblong, pinnatisect or pinnatifid; ray florets female; achenes pilose, with distinct corona.
2a. Leaves arachnoid lanate on both surfaces; capitula 1.2–2 cm wide; achenes ca. 3 mm, pilose .................................. 1. Allardia tomentosa
2b. Leaves glabrous on both surfaces; capitula to 1 cm wide; achenes ca. 1.5 mm, glabrescent ........................................ 2. Allardia stoliczkae

1b. Leaves 0.8–2 cm; blade spatulate or cuneate, palmately 3–5-lobed or -parted; ray florets sometimes sterile; achenes mostly glabrous (pilose in A. lasiocarpa), with reduced corona.
3a. Achenes pilose .............................................................................................................................................. 8. A. lasiocarpa
3b. Achenes glabrous.

4a. Plants glabrous or tomentose only below involucre and on peduncle; achene 2.5–4 mm.
5a. Capitula 2.5–3.5 cm in diam., peduncles glabrous; phyllaries 6–7 mm, glabrous, apex cuspidate; achenes 2.5–4 mm ................................................................................................................................. 3. Allardia tridactylites
5b. Capitula 1.5–2.5 cm in diam., peduncles sparingly hairy; phyllaries 3.5–4.5 mm, basally hairy, apex ± obtuse; achenes 2.5–3.5 mm ................................................................................................. 4. Allardia glabra

4b. Plants grayish white lanate; achenes 1.2–2 mm.
6a. Plants rather sparsely lanate; capitula ca. 2 cm in diam.; leaves 8–12 mm .................................................................. 5. A. huegelii
6b. Plants densely lanate, hairs thick.

7a. Capitula 3.5–4 cm in diam.; leaves 10–15 mm, distinctly 3–5-lobed ................................................... 6. Allardia tridactylites
7b. Capitula 1.5–2 cm in diam.; leaves 4–8 mm, obscurely 3-lobed .................................................................. 7. A. nivea


羽裂扁毛菊 yu lie bian mao ju

Waldheimia tomentosa (Decaisne) Regel.

Herbs, perennial, 10–15 cm tall, with procumbent, much-branched rhizomes. Stems many, laxly caespitose, branched or not, bases with remains of brown scarious leaf sheaths. Petioles enlarged at base; leaf blade oblong to linear-oblong, 4–5 × 0.2–1.5 cm, 2-pinnatifid, both surfaces white arachnoid lanate, primary lateral pinnae 6–9-paired, distal pinnae gradually smaller; ultimate pinna lanceolate to ovate, apex long mucronate. Capitulum solitary, pedunculate. Involucre hemispheric, 1.5–2 cm in diam.; phyllaries in 3 or 4 rows, abaxially hairy at base, scarious margin broad, dark brown, outer phyllaries ovate-oblong to oblong, ca. 7 mm, apex ± obtuse, inner ones oblong, ca. 8 mm. Ray florets 10–20, white or pale pink; lamina linear-oblong, 6–11 mm. Disk florets yellow, 5-lobed. Achenes narrowly oblong, ca. 4.5 mm, 6–8-ribbed; ribs pale red-brown in upper part, sparsely villous in upper 1/2, with sessile glands; corona scales many, ca. 6 mm, brownish at apex. Fl. and fr. Aug.–Sep.

Talus on mountain slopes; 4200–5200 m. W Xizang (Burang) [Afghanistan, India, Kazakhstan, Pakistan, Uzbekistan].

2. Allardia stoliczkae C. B. Clarke, Compos. Ind. 145. 1876.

光叶扁毛菊 guang ye bian mao ju

Waldheimia stoliczkae (Karelin & Kirilov) Schultz Bipontinus, Pollichia 20–21: 442. 1863.

三指扁毛菊 san zhi bian mao ju


Herbs, perennial, to 6 cm, with woody, procumbent, much-branched rhizome; stems many; entire plant glabrous. Leaves in dense rosettes, sessile; leaf blade cuneate, 1–2 × 0.5–1 cm, glabrous, base cuneate-attenuate, apex 3(–5)-lobed or -parted. Capitulum solitary, terminal, 2.5–3.5 cm in diam., sessile. Involucre hemispheric, 1.5–2 cm in diam.; phyllaries in 3 or 4 rows, abaxially glabrous, scarious margin broad, dark brown, outer phyllaries ovate-oblong to oblong, ca. 7 mm, apex cuspidate, inner ones oblong, ca. 8 mm. Ray florets 8–15; lamina pinkish white, pink, or purple-red, elliptic-oblong, 7–11 × 2.5–4 mm, apex 2- or 3-denticulate. Disk florets: corolla yellow, 4–5.5 mm, apex 5-lobed. Achenes 2.5–4 × 0.6–0.8 mm, somewhat curved, 5-ribbed, glabrous, with sessile glands. Corona scales many, bristlelike, usually tinged reddish or brownish, 6.5–8 mm. Fl. Jul.–Sep.

Floodlands, talus on mountain slopes; 3000–4000 m. Xinjiang, Xizang [Kazakhstan, Mongolia, Russia].


扁毛菊 bian mao ju

Waldheimia glabra (Decaisne) Regel; W. tridactylites Karelin & Kirilov subsp. glabra (Decaisne) Podlech.

Herbs, perennial, to 4 cm, with woody, procumbent, much-branched rhizomes; stems many; entire plant grayish or grayish green, loosely tomentose to pubescent with long simple hairs. Leaves in dense rosettes, sessile; leaf blade cuneate, 1–1.5 × 0.5–0.8 cm, both surfaces glabrous, base cuneate-attenuate, apex 3(–5)-lobed or -parted. Capitulum solitary, terminal, 2.5–3.5 cm in diam., sessile. Involucre hemispheric, 1–1.5 cm in diam.; phyllaries in 3 or 4 rows, abaxially hairy at base, scarious margin broad, dark brown, apex ± obtuse, outer phyllaries ovate-oblong to oblong, ca. 7 mm, inner ones oblong, ca. 8 mm.
Ray florets 8–15; lamina deep pink to almost white, elliptic-oblong, 6–10 × 2.5–4 mm, apex 2- or 3-denticulate. Disk florets: corolla yellow, 3.5–5 mm, apex 5-lobed. Achenes 2.5–3.5 × 0.5–0.7 mm, somewhat curved, 5-ribbed, glabrous, with sessile glands. Corona scales 6–7.5 mm, tinged pinkish violet or brownish. Fl. Jul–Sep.

Scree slopes, rock crevices; (3500–)4900–5500 m. Xizang [Afghanistan, Bhutan, N India, Kazakhstan, Pakistan, Uzbekistan].


Herbs perennial, ca. 2 cm tall, with creeping much-branched rhizomes; stems many, short, strongly fragrant. Leaves sessile; leaf blade oblong-cuneate, 8–12 × 3–5 mm, both surfaces gray-white lanate, apex 3-parted. Capitulum solitary, ca. 2 cm in diam., pedunculate or not. Involucre hemispheric, ca. 15 mm in diam.; phyllaries in 3 rows, abaxially lanate, oblong-lanceolate to oblong-linear, scarious margin broad or narrow, dark, apex obtuse or acute. Ray florets pink; lamina oblong, ca. 7 mm, apex minutely 2- or 3-toothed. Disk florets many, yellow, 5-lobed. Achenes ca. 1.5 mm, glabrous, with sessile glands. Corona scales many, apically greenish, subulate, ca. 3 mm. Fl. and fr. Aug.

Among stones; ca. 5800 m. S Xizang (Zhongba) [Tajikistan (Pamirs)].

6. **Allardia vestita** J. D. Hooker & Thomson ex C. B. Clarke, Compos. Ind. 145. 1876.

Herbs perennial, 4–6 cm tall, with creeping woody rhizomes; stems many, erect; most parts densely and thickly yellowish or gray-white lanate. Leaves sessile; leaf blade cuneate, 1–1.5 × 0.4–0.5 cm, apex 3-lobed. Capitulum solitary at apex, shortly pedunculate. Involucre hemispheric, ca. 1.5 cm in diam.; phyllaries in 4 or 5 rows, ovate to oblong, 4–6 mm, abaxially lanate, scarious margin deep brown. Ray florets pink; lamina broadly elliptic. Disk florets yellow, 5-lobed. Achenes ca. 2 mm, with sessile glands. Pappus many, bristlelike, deplanate, 2–3 mm, apically brownish. Fl. and fr. Aug–Sep.

Mountain slopes; 5000–5300 m. S Xizang (Tingri) [India, Pakistan].

4. **Allardia nivea** Waldheimia nivea (J. D. Hooker & Thomson ex C. B. Clarke) Regel.

Herbs, perennial, villous, with dense appressed gray-white hairs. Rhizome procumbent, woody, much branched. Stems many, erect, with dense lanate leaves. Leaves sessile; leaf blade cuneate, 4–8 × 1.5–2.5 mm, apex 3-lobed. Capitulum solitary at apex, shortly pedunculate. Involucre hemispheric, 8–11 mm in diam.; phyllaries in 3 or 4 rows, abaxially lanate, margin narrowly brown scarious, outer and middle ones ovate to oblong, 4–5 mm, inner ones oblanceolate, ca. 6 mm. Ray florets 17–20, red; lamina oblong, 7–8 mm, apex 2-denticulate. Disk florets yellow, 5- or 6-lobed. Achenes ca. 1.2 mm, glabrous, with sessile glands. Pappus many, bristlelike, pale yellow, ca. 2.5 mm. Fl. and fr. Jul.

Lateral moraines of glaciers; 5300–5400 m. S Xizang (N slopes of Qomolangma Feng) [Afghanistan, India, Nepal, Pakistan].


Herbs, perennial. Stems procumbent, much branched. Leaves sessile; leaf blade spatulate, 1.5–2 × 0.6–0.7 cm, both surfaces sparsely lanate, apex 5–7-parted or -lobed. Capitulum solitary, to 3 cm in diam., sessile. Involucre hemispheric; phyllaries in 3 or 4 rows, triangular-lanceolate to oblong, 5–7 mm, abaxially sparsely lanate. Ray florets deep pink; lamina elliptic-oblong, ca. 13 mm, apex entire. Disk florets yellow. Achenes terete, ca. 2.5 mm, 5-ribbed, white villous, with sessile glands. Pappus many, bristlelike, deplanate, yellow-brown, longer than corolla.

● Stony grasslands by rivers, broken stony places on mountain slopes; 4700–5200 m. S Xizang (N slopes of Qomolangma Feng).


小甘菊属 xiao gan ju shu

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

**Poljakovia** Grubov & Filatova.

Subshrubs or perennial herbs, compact, tomentose. Leaves alternate to rosulate, dense or lax. Capitula terminal, solitary or several and corymbose, homogamous, discoid. Involucres hemispheric or cup-shaped; phyllaries herbaceous, in 3 or 4 rows, margin brown, dark brown, or hyaline scarious. Receptacle convex or flat, eptaleate. Florets all bisexual, yellow, tubular, fertile, 5-lobed, with a narrow tube and a distinct limb. Anther obtuse at base, with apical ovate-lanceolate appendage. Style branches linear. Achenes trigonously terete, faintly 5- or 6-ribbed, glabrous or sparsely pilose. Corona of 5–12 pappuslike lanceolate scales ca. as long as or slightly longer than corolla.
About 30 species: C Asia, China, Mongolia, Russia; five species in China.

1a. Subshrubs (30–)40–50 cm tall ................................................................. 1. C. maximowiczii

1b. Compact ± scapose herbs 5–20 cm tall.

2a. Phyllaries with scarious margins colorless; pappus of 5 scales; plants growing at 500–2000 m.

3a. Plants annual or biennial, easily pulled out of ground; achenes glabrous; pappus with all scales acute; receptacle conspicuously conical-globose ................................................................. 2. C. discoidea

3b. Plants perennial, often forming mats; achenes sparingly pilose; pappus with 3 scales aristate mucronate; receptacle flat or slightly convex .................................................. 3. C. lasiocarpa

2b. Phyllaries with scarious margins brown; pappus of 8–12 scales; plants growing above 3000 m.

4a. Scarious phyllary margins broad, dark brown, enlarged at apex; achenes glabrous or pilose only toward apex ................................................................. 4. C. chrysocephala

4b. Scarious phyllary margins narrow, pale brown, not enlarged at apex; achenes uniformly sparingly pilose ................................................................. 5. C. tianschanica


**Handelia trichophylla**

Herbs, perennial; stems 1 to few, thick, with wide pith; indumentum of basified hairs. Basal leaves large, petiolate; stem leaves small, sessile, oblong, 3-naticepsose. Synflorescences cymose, dense or lax, flat-topped. Capitula homogamous, discoid. Involucre coryliform, 4–6 mm in diam.; phyllaries in 3 rows, herbaceous, scarios, involucres coryliform or linear-lanceolate, inner ones longer, oblong-linear. Florets yellow, 5-lobed. Achenes 1.5–2.2 mm, 5- or 6-ribbed, sparsely pilose. Corona scales 8–12, linear or elliptic-linear. Fl. and fr. Jul–Aug.

Rocky places on mountain slopes, meadows, gravelly places, floodlands; ca. 3200 m. Xinjiang (Tian Shan) [Kazakhstan (C Tian Shan)].


**灰叶匹菊属**

**Chrysanthemum arassanicum** C. Winkler; *C. artemisiafolium* Klatt; *C. pyrethroides* (Karelin & Kirilov) B. Fedtschenko; *C. richteria* Bentham; *C. transiliense* (Herder) Minkwitz; *Pyrethrum arassanicum* (C. Winkler) O. Fedtschenko; *P. pyrethroides* (Karelin & Kirilov) B. Fedtschenko ex Krascheninnikov; *P. transiliense* (Herder) Regel; *P. transiliense* var. *subsessile* Regel; *P. transiliense* var. *subvillosum* Regel; *P. transiliense* var. *tomentosum* Regel; *Tanacetum transiliense* Herder.

Herbs, perennial, (5)–10–40 cm tall, rhizomatous; stems erect or ascending, base covered with sheathing leaf bases, fascicled, rarely solitary, few branched or not, gray-white, villous with curved long simple hairs especially below capitulum. Basal leaves: petioles to 4 cm; leaf blade narrowly elliptic, 1.5–7 × 0.6–2 cm, 2-pinnatisect, both surfaces gray-white, densely or sparsely villous; primary lateral segments 3–8-paired; ultimate segments linear-lanceolate or ovate-lanceolate, sessile, rather small. Synflorescence terminal, with 1(–3) capitula, not conspicuously flat-topped. Involucre coryliform, 1–1.4 cm in diam.; phyllaries in 4 rows, scarios margin dark brown, outer phyllaries ovate or long ovate-triangular, 3–4(–6) mm, middle and inner ones narrowly lanceolate or oblanceolate, 5–15 mm, middle ones abaxially densely villous with fluffy curved long simple hairs, inner ones glabrous or nearly so abaxially. Ray florets white or pale red; lamina elliptic or narrowly elliptic, 5–15 mm, apex 3-denticulate. Achenes ca. 2.5 mm. Corona ca. 1 mm, divided to base. Fl. and fr. Jun–Aug.

Meadows, rocky mountain slopes, floodlands; below 3700 m. Xinjiang [N India, Kazakhstan, Russia, Uzbekistan].


**灰叶**

**Chrysanthemum arassanicum** C. Winkler; *C. artemisiafolium* Klatt; *C. pyrethroides* (Karelin & Kirilov) B. Fedtschenko; *C. richteria* Bentham; *C. transiliense* (Herder) Minkwitz; *Pyrethrum arassanicum* (C. Winkler) O. Fedtschenko; *P. pyrethroides* (Karelin & Kirilov) B. Fedtschenko ex Krascheninnikov; *P. transiliense* (Herder) Regel; *P. transiliense* var. *subsessile* Regel; *P. transiliense* var. *subvillosum* Regel; *P. transiliense* var. *tomentosum* Regel; *Tanacetum transiliense* Herder.

Herbs, perennial, 30–100 cm tall, with robust taproot; stem usually solitary, thick, striate, lower part densely dirty white

拟天山蓍属 ni tian shan shi shu

Shi Zhu (石铸 Shi Chu); Christopher J. Humphries, Michael G. Gilbert

Herbs, biennial to perennial, dying after flowering; stems 1–4, thick with wide pith; indumentum of basifixixed hairs, arachnoid. Leaves alternate, 2- or 3-pinnatisect. Capitula many in dense pseudoumbel, long pedunculate, homogamous, discoid. Involucr e hemispheric; phyllaries in 2 or 3 rows, margins scarious, pale; innermost phyllaries resembling receptacle scales. Receptacle hemispheric to conical, epaleate or with a few marginal palea. Florets yellow, bisexual, fertile, narrowly tubular with abruptly expanded campanulate limb, 5-lobed; tube glandular papillate. Anthers without basal appendages; apical appendage ovate-lanceolate, apex obtuse. Style branches linear, apex truncate. Achenes narrowly cylindric, curved, circular in cross section, inconspicuously 4- or 5-ribbed, glandular-papillate. Pappus absent.

One species: Afghanistan, China, Kazakhstan, Tajikistan, Turkmenistan; SW Asia (Iran).


拟天山蓍 ni tian shan shi

Tanacetum umbelliferum Boissier, Diagn. Pl. Orient., ser. 2, 3: 30. 1856; Chrysanthemum floccosum Kitamura; C. trichophyllum (Regel & Schmalhausen) Kuntze; C. umbelliferum (Boissier) Hoffmann; Lepidolopsis umbellifera (Boissier) Poljakov; Pyrethrum trichophyllum (Regel & Schmalhausen) Bornmüller & Sintenis (1900–1910), not Grisebach (1846); P. umbelliferum (Boissier) Boissier; T. trichophyllum Regel & Schmalhausen.

Herbs, biennial or short-lived perennial, dying after flowering, 20–100 cm tall, roots long and thick; stems solitary or few, robust, unbranched below synflorescence, base covered with persistent leaf bases; most parts densely arachnoid hairy. Leaf blade to 30 × 5–6 cm, bipinnate, ultimate segments linear, to 0.6 mm wide, with cartilaginous cusp. Synflorescence umbel-like. Capitula many, long pedunculate. Involucres hemispheric, 3–5 × 6–9 mm; outer phyllaries oblong, margin broadly scarious, erose; innermost phyllaries much narrower. Florets many; corolla yellow, with linear tube and abruptly expanded campanulate limb, 5-lobed, strongly glandular papillate. Achenes cylindric, 1.8–2.4 × ca. 0.3 mm, obscurely 4- or 5-ribbed, tuberculate, glandular. Corona absent.

Stony slopes, sands, gravel beds, etc. Xinjiang [Afghanistan, Kazakhstan, Pakistan, Uzbekistan] and on the account in Fl. URSS (26: 125. 1961).

No material from China was seen by the present authors. The description is based primarily on the account in Fl. URSS.


女蒿属 nü hao shu

Shi Zhu (石铸 Shi Chu); Christopher J. Humphries, Michael G. Gilbert

Herbs, perennial, sometimes stemless, small subshrubs, or cushion plants; indumentum of medifixied hairs. Leaves alternate, pinnatifid or 3-lobed. Synflorescences cymose, dense or lax, forming panicles, clusters, or heads. Capitula few to many, homogamous, discoid. Involucres cymose or conical; phyllaries in 3 or 4 rows, herbaceous or rigidly herbaceous, scarious margins white or brown. Receptacle flat to convex, epaleate. Florets all bisexual; corolla tubular, apex 5-lobed. Anther bases obtuse, apical appendage ovate-lanceolate. Style branches linear, apex truncate. Achenes subterete, 4–7-ribbed, with a ± distinct apical rim. Corona absent.

Nineteen species: C Asia, China, Himalaya, Mongolia; 11 species (six endemic) in China.

Hippolytia dolichophylla (Kitamura) K. Bremer & Humphries (Bull. Nat. Hist. Mus. London, Bot. 23: 106. 1993; Chrysanthemum dolichophyllum Kitamura, Acta Phytotax. Geobot. 23: 73. 1968, based on Tanacetum longifolium Wallich ex Candolle, Prodr. 6: 130. 1838, not Thunberg (1900); C. longifolium K. H. Rechinger (1955), not Sessé & Mociño (1894); T. dolichophyllum (Kitamura) Kitamura; T. himachalense Aswal & Mehrotra, nom. illeg. superfl.) was recorded from Sichuan in Annot. Checkl. Fl. Pl. Nepal (69. 2000, as T. dolichophyllum), disjunct from the main area of distribution in the Himalaya between Kashmir and Nepal (see http://www.efloras.org/florataxon.aspx?flora_id=110&taxon_id=24245863; accessed 8 Apr 2011). No specimen has been seen by the present authors. This species would key out as H. herderi, but it differs from that species and all others in Hippolytia by having leaves 12–25 cm.

1b. Cushion plants with several distinct clusters of capitula.

5a. Capitula fascicled-corymbose at apices of branches or stem; involucres campanulate, glossy, yellowish or straw-colored, phyllaries in 4 or 5 rows, scarios margins pale brownish or white.
   6a. Perennial herbs, often with a solitary stem .......................................................................................................... 3. H. delavayi
   6b. Subshrubs.

7a. Leaves 2-pinnatisect, abaxially green or deep green, glabrous; florets ca. 3.2 mm .............................................. 2. H. desmantha
7b. Leaves pinnatipartite, abaxially gray-white, densely appressed pubescent; florets ca. 2 mm .................. 1. H. kaschgarica

5b. Capitula corymbose or glomerulate; involucres cuneate or cuneate-campanulate, matt, phyllaries in 3 or 4 rows, scarios margins dark brown.
   8a. Leaves 3-pinnatisect; capitula many .......................................................................................................................... 4. H. yunnanensis
   8b. Leaves 2-pinnatisect; capitula 4–12.

9a. Plants to 30 cm tall; leaves narrowly elliptic or ovate, 2–4 cm, ultimate segments narrowly elliptic ........ 5. H. herderi
9b. Plants to 12 cm tall; leaves ovate, ultimate segments linear.

10a. Stem leaves sessile ..................................................................................................................................................... 6. H. senecionis
10b. Stem leaves petiolate, petiole 5–10 mm ....................................................................................................................... 7. H. tomentosa

1a. Rosette or cushion plants with concealed stems, to 7 cm tall, usually less; capitula in very dense sessile clusters.
   2a. Rosette plants with a single central cluster of capitula.

3a. Leaves 2-pinnatisect .................................................................................................................................................... 8. H. glomerata
3b. Leaves 3–7-pinnatisect .................................................................................................................................................. 9. H. syncalathiformis

2b. Cushion plants with several distinct clusters of capitula.

4a. Leaves spatulate, apex 3–6-lobed ............................................................................................................................. 10. H. gossypina
4b. Leaves orbicular or flabelliform, biteminate-palmately divided ........................................................................ 11. H. kennedyi

H. kaschgarica

Subshrubs, 25–50 cm tall; old branches gray; young branches greenish or brown-green, pubescent with appressed powdery hairs. Leaves with petioles ca. 5 mm; leaf blade ovate, elliptic, obliquely elliptic, or narrowly flabelliform, 0.5–2 × 1–1.5 cm, both surfaces green, glabrous, 2-pinnatisect; primary lateral segments 2- or 3-paired; ultimate segments linear, narrowly elliptic, or lanceolate; leaves below synflorescence sometimes pinnatisect. Capitula 3–5, fascicled-corymbose at apices of branches, pedunculate; peduncle slender, ca. 1.5 cm, pubescent with appressed powdery hairs. Involucres campanulate, 4–5 mm in diam.; phyllaries in 4 rows, rigidly herbaceous, glossy, yellow-white or straw-colored, marginal brown or white, outer phyllaries lanceolate, ca. 1.8 mm, middle and inner ones oblanceolate, ca. 3 mm. Florets yellow, ca. 2 mm. Achenes ca. 0.15 mm. Fl. and fr. Aug–Oct.

- Mountain slopes, fissures of rocks, grasslands, desert steppes; 1900–2300 m. Gansu, Nei Mongol, Ningxia, Xinjiang.

Tzvelev (Fl. URSS 26: 412. 1961) suggested that this species would have to be removed from *Hippolytia*. Bremer and Humphries (Bull. Nat. Hist. Mus. London, Bot. 23: 106. 1993) also regarded this species as anomalous, and it was subsequently transferred by Grubov and Filatova to the new genus *Poljakovia* (Novosti Sist. Vyssh. Rast. 33: 227. 2001).
Herbs, perennial, 7–25 cm tall; stems erect, solitary, unbranched, somewhat scapelike, densely villous. Leaves in basal rosettes and scattered along stems; basal leaves: petiole 2–6 cm; leaf blade elliptic or narrowly elliptic, 2–7.5 × 1–2.5 cm, 2-pinnatisect, abaxially densely or sparsely villous, adaxially glabrous or nearly so; primary lateral segments 4–11-paired; ultimate segments linear, triangular-lanceolate, or falcate. Stem leaves few, similar to basal leaves, small; uppermost stem leaves pinnatisect. Synflorescence a terminal flat-topped cluster. Capitula 6–11; peduncles ca. 2 mm, villous or pubescent. Involucres campanulate, ca. 5 mm in diam.; phyllaries in 4 rows, rigidly herbaceous, glossy, yellow-white, scarious margin pale brown or white, outer phyllaries lanceolate, ca. 4 mm; middle and inner ones narrowly elliptic, elliptic-oblancoate, or oblancoate, 4.5–5 mm. Achenes ca. 2 mm, with a ± distinct apical rim. Fl. and fr. Aug–Oct.

- Alpine meadows; 3300–4000 m. Sichuan, Yunnan.


云南女蒿 yun nan nu hao


Herbs, perennial, 27–40 cm tall; stems erect, stout, upper parts corymbose branched, red-purple, gray-white below synflorescence, densely villous, progressively sparsely villous toward base. Leaves in basal rosettes and scattered along stems; basal leaves: petiole to 13 cm; leaf blade elliptic or narrowly elliptic, 5–12 × 3–6 cm, 3-pinnatisect, abaxially villous, adaxially glabrescent or glabrous; primary lateral segments 11–14-paired; ultimate segments linear; stem leaves similar to basal leaves. Synflorescence a terminal ± flat-topped panicle or compound panicle. Capitula many, branches densely villous. Involucres cuneate or cuneate-campanulate, ca. 5 mm in diam.; phyllaries in 3 rows, abaxially sparsely villous, inner ones lanceolate, ca. 3.5 mm, middle and inner ones lanceolate, oblancoate, or narrowly elliptic, 3.5–4 mm, abaxially glabrous. Florets yellow, ca. 3 mm. Fl. Jun–Sep.

- Alpine meadows; 3400–4000 m. Yunnan.


新疆女蒿 xin jiang nu hao


Herbs, perennial, 10–30 cm tall; stems erect or ascending, with short flowering branches toward apex, sparsely pubescent, or glabrescent. Leaves in basal rosettes and scattered along stems; basal leaves and leaves on vegetative branches: petiole 3–5 cm; leaf blade narrowly elliptic or ovate, 2–4 × 1–1.5 cm, 2-pinnatisect, both surfaces gray-white, pubescent; primary lateral segments 2–4-paired; ultimate segments narrowly elliptic. Stem leaves similar to basal leaves, shortly petiolate. Synflorescence a terminal dense or lax flat-topped cyme. Capitula 3–10. Involucre broadly cuneate or hemispheric, ca. 1 cm in diam.; phyllaries in 3 rows, abaxially sparsely pubescent, scarious margin broad, dark brown, outer phyllaries lanceolate, ca. 2 mm, middle and inner ones narrowly elliptic, 5–6 mm. Florets yellow, ca. 3.5 mm. Fl. Sep.

Mountain regions, meadows; ca. 2500 m. Xinjiang (Xinyuan) [Kazakhstan].


普兰女蒿 pu lan nu hao


Herbs, perennial, ca. 12 cm tall; stem solitary, gray-white, appressed pubescent especially below capitula. Leaves in basal rosettes and scattered along stems; basal leaves: petiole 0.8–1.5 cm; leaf blade ovate, ca. 1.2 × 1 cm, 2-pinnatisect, both surfaces gray, densely pubescent; primary lateral segments 3-paired; ultimate segments narrowly elliptic. Stem leaves similar to basal leaves, few; leaves below synflorescence pinnatisect. Synflorescence a terminal flat-topped cyme, ca. 2 cm in diam. Capitula ca. 6; peduncle densely lanate. Involucres cuneate-campanulate, 5–6 mm in diam.; phyllaries in 4 rows, abaxially lanate, scarious margin dark brown, outer phyllaries lanceolate, ca. 4 mm, middle ones narrowly lanceolate or oblancoate, 5–5.5 mm, abaxially pubescent, inner ones similar but abaxially glabrous. Florets yellow, ca. 3.5 mm. Fl. Aug.

Desert steppes; 2000–3700 m. W Xizang (Burang) [India].


灰叶女蒿 hui ye nu hao

*Tanacetum tomentosum* Candolle, Prodr. 6: 130. 1838.

Herbs, perennial; stems solitary or fascicled, ca. 9 cm tall, erect, gray-white, appressed pubescent especially near capitula. Basal leaves with petiole 1–1.5 mm; leaf blade ovate, ca. 1.3 × 1 cm, both surfaces gray-white, densely pubescent, 2-pinnatisect; primary lateral segments 2- or 3-paired; ultimate segments narrowly elliptic. Stem leaves similar to basal leaves; leaves below synflorescence pinnatisect. Capitula 4–6, in apical dense corymb, pedunculate; peduncle very short, densely lanate or villous. Involucres campanulate, ca. 7 mm in diam.; phyllaries in 3 rows, abaxially villous, margin dark brown or pale brown scarious, outer ones lanceolate, ca. 4 mm, middle and inner ones elliptic or narrowly elliptic, 3–5 mm. Florets yellow, ca. 3.5 mm. Fl. Jun.

Deserts; 3500–3700(–4700) m. Xizang [Kashmir].


团伞女蒿 tuan san nu hao
Herbs, perennial, stemless; taproot long. Leaves in a single dense basal rosette around synflorescence; leaf blade narrowly ovate, elliptic, or narrowly elliptic, 1.5–1.8 × 0.5–0.8 cm, 2-pinnatisect, both surfaces densely villous; primary lateral segments 2–4-paired; ultimate segments narrowly elliptic or elliptic-lanceolate. Synflorescence a dense hemispheric glomerule, ca. 2 cm in diam. Capitula many. Involucres cuneate-campanulate, ca. 6 mm in diam.; phyllaries in 3 rows, abaxially villous, scarious margin dark brown; outer phyllaries lanceolate, 5–7 mm middle and inner ones obovate, 4–5 mm Florets yellow, ca. 3.5 mm. Fl. Aug.

- Alpine meadows; ca. 4600 m. Xizang (Nyêmo).


合头女蒿 he tou nü hao

Herbs, perennial, stemless; taproot long. Leaves in a single dense basal rosette around synflorescence; petiole 0.7–1.7 cm; leaf blade narrowly elliptic, 0.5–1 × 0.3–0.5 cm, 3–7-pinnatisect, abaxially densely villous, axially sparsely villous or subglabrescent; segments linear; sometimes leaves linear and entire. Synflorescence a dense hemispheric glomerule ca. 2 cm in diam. Capitula many. Involucres cuneate-campanulate, ca. 6 mm in diam.; phyllaries in 3 rows, herbaceous, abaxially villous, scarious margin dark brown, outer phyllaries lanceolate, 5–7 mm middle and inner ones obovate, 4–5 mm. Florets yellow, ca. 3.5 mm. Fl. Sep.

- Alpine meadows, rocky slopes; 4500–5500 m. Xizang.


棉毛女蒿 mian mao nü hao

**Tanacetum gossypinum** C. B. Clarke, Compos. Ind. 154. 1876.

Cushion plants, ca. 7 cm tall. Leafy shoots densely compact, with dense overlapping leaves. Leaves inconspicuously petiolate; leaf blade spatulate, 1–1.2 × 0.35–0.7 cm, white or gray-white, both surfaces densely long lanate, apex truncate or rounded, 3–6-divided. Capitula 10, in a dense corymb ca. 2.5 cm in diam. at apices of branches. Involucres cuneate, ca. 6 mm in diam.; phyllaries in 3 rows, outer ones linear, ca. 7 mm, abaxially densely long lanate, middle and inner ones obovate, 5 mm, abaxially lanate above middle part or at upper part in inner ones. Florets yellow, ca. 3 mm. Fl. Aug.–Oct.

- Deserts, alpine gravel heaps, exposed rocks at mountain summits; 4500–5400 m. Xizang (Yadong) [Bhutan, India, Nepal].


垫状女蒿 dian zhuang nü hao


Cushion plants, dense, 2–4 cm tall, with long thick roots; stems much branched, branches with dense thick leaf remnants. Leaves in dense rosettes at or near ground level; petiole 0.5–1.2 cm; leaf blade orbicular or flabelliform, 0.2–0.4 × 0.3–0.6 cm, bitemately palmatisect or 2-pinnatisect, both surfaces densely dirty yellow, gray-white villous, or lanate. Synflorescence a large, dense, hemispheric glomerule, ca. 10 cm in diam. Capitula many; peduncle ca. 4 mm, densely villous. Involucres cuneate, ca. 7 mm in diam.; phyllaries in 3 rows, abaxially villous, especially in outer and middle ones, scarious margin dark brown, outer phyllaries lanceolate, ca. 4 mm, middle ones narrowly elliptic, ca. 3.5 mm, inner ones obovate, ca. 3 mm. Florets yellow, ca. 3.5 mm. Achenes ca. 1.5 mm. Fl. and fr. Aug.–Sep.

- Gravelly places of alpine deserts; 4700–5200 m. Xizang [India].

The whole plant is used medicinally for treating laryngitis.  


喀什菊属 ka shi ju shu

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert


Two species: China, Kazakhstan, Mongolia; two species in China.

1a. Fertile shoots with long declined branchlets; leaves narrowly lanceolate to linear, 1.7–5 mm wide, margin usually entire, occasionally 3-parted ............................................................... 1. **K. brachanthemoides**

1b. Fertile shoots with short branchlets; leaves spatulate or obovate, 7–15 mm wide, apex 3–5-partite, rarely pinnatisect ................................................................. 2. **K. komarovii**


密枝喀什菊 mi zhi ka shi ju

Subshrubs, ca. 50 cm tall; old branches grayish, year-old
branches virgate, narrowly angular, straw-colored in lower part, green in upper part. Middle leaves sessile; leaf blade linear to narrowly lanceolate, 1–2 × 0.17–0.5 cm, both surfaces glabrous or scattered pubescent with stellate hairs, margin entire, occasionally 3-parted. Distal leaves gradually smaller, linear. Synflorescence an irregular panicle, longer than wide, individual cymes with 2–5 capitula. Capitula ovoid, sessile or shortly pedunculate. Involucres cupular, ca. 2 mm in diam.; phyllaries in 2–4 rows, margin scarious, abaxially with scattered sessile glands, outer ones small, suborbicular, inner ones large, broadly elliptic or lanceolate-elliptic. Corolla yellow, exterior with scattered stellate hairs and sessile glands, margin entire, occasionally 3-parted. Distal leaves gradually smaller, linear. Synflorescence, pubescent or glabrous. Basal and lower stem leaves entire. Synflorescence a lax, ± flat-topped cyme, often reduced to solitary capitulum. Capitula heterogamous, radiate. Involucres cupular, ca. 2 mm in diam.; phyllaries in 2–3 rows, margin scarious, outer phyllaries suborbicular, inner ones broadly ovate. Florets yellow, exterior scattered stellate pubescent; marginal female florets 3–5, ascleriform, tapering above, 3-denticulate; disk florets many, tubular. Achenes ovoid, 1–1.2 mm.

Dry mountain valleys, old dry riverbeds; 1000–1500 m. Xinjiang (Toksun) [Kazakhstan].


Two species: China, Japan, Korea, Russia; Europe; one species in China.


Herbs, perennial, with procumbent rhizomes; indumentum absent or of basifixed hairs. Leaves alternate, entire or pinnatifid. Synflorescence a lax, ± flat-topped cyme, often reduced to solitary capitulum. Capitula heterogamous, radiate. Involucres coryliform; phyllaries in 2 or 3 rows, scarious margins brown or dark brown. Receptacle convex, epaleate. Marginal florets in 1 row, female, usually sterile; lamina white or reddish. Disk florets many, yellow, bisequal; corolla tubular, apex 5-lobed. Anther bases obtuse, apical appendage ovate or elliptic-ovate. Style branches linear, apex truncate. Achenes distinctly 8–12-ribbed, with apical rim. Corona absent.

Two species: China, Japan, Korea, Russia; Europe; one species in China.


Herbs, perennial, with procumbent rhizomes; indumentum of basifixed and medifixed hairs. Leaves alternate, pinnatisect. Synflorescence of solitary terminal capitulum. Capitula heterogamous, radiate or disciform. Involucres hemispheric; phyllaries in 2 or 3 rows, margin scarious, with lower parts straw-colored, upper parts pale green, scattered stellate pubescent. Middle stem leaves sessile; leaf blade spatulate or oblanceolate, 1–3 × 0.7–1.5 cm, apex 3–5-partite, rarely pinnatisect, sparsely stellate pubescent; upper stem leaves entire. Synflorescence a dense flat-topped fascicle sometimes with additional axillary capitulum below. Capitula 3–5(–8). Involucre cupular, 2–3 mm in diam.; phyllaries in 2–4 rows, margin scarious, outer phyllaries suborbicular, inner ones broadly ovate. Florets yellow, exterior scattered stellate pubescent; marginal female florets 3–5, ascleriform, tapering above, 3-denticulate; disk florets many, tubular. Achenes ovoid, 1–1.2 mm.

Marshlands, wet grasslands. Heilongjiang, Jilin, Nei Mongol [Japan, Korea, Russia].


Herbs, annual; indumentum of basifixed hairs. Leaves alternate, pinnatisect. Synflorescence of solitary terminal capitula. Capitula pedunculate, heterogamous, radiate or disciform. Involucres hemispheric; phyllaries in 2 or 3 rows, scarious margins broad, pale.
Receptacle conical, hollow, epleate. Marginal florets female, fertile; lamina when present white, usually absent in Chinese material. Disk florets yellow or reddish, bisexual, fertile; corolla tubular, inflated at base, apex 5-lobed. Anther appendages ovoid, almost 1/2 as long as anthers. Achenes circular to slightly dorsiventrally compressed in cross section, with 3–5 adaxial ribs, with multicellular hairs between ribs. Corona lacerate or fimbriate, slightly longer adaxially. $x = 7$.

Five species: Afghanistan, China, Kazakhstan, Kyrgyzstan, Pakistan, Turkmenistan; SW Asia (Iran); one species in China.


近球状小花菊 $jin$ $qiu$ $zhuang$ $xiao$ $hua$ $ju$


Herbs, annual, 3–15 cm tall; stems simple or branched from base, sparsely white lanate. Leaves succulent, petiolate; leaf blade (0.8–)1–2(–3) × (0.3–)0.5–0.7(–1) cm, pinnate, sparsely grayish lanate; segments linear-lanceolate, apex acute; uppermost leaves linear. Capitula solitary; peduncle long, apically thicker, apically thicker, pubescent. Involucre very broadly obconical, 4–10 mm wide; phyllaries linear-oblong, slightly recurved, green, margin narrowly membranous. Marginal florets usually absent, white when present; usually florets all tubular, lemon-yellow, slightly constricted in middle but not inflated below this, exserted from involucre. Achenes 1–1.5 × 0.25–0.5 mm, abaxially slightly convex, adaxially with 3 or 4 obscure ribs, densely white scaly in broader part. Corona oblique, to 0.5 mm, not deeply lacerate, lobes acuminate.

Xinjiang (Tian Shan) [Kazakhstan, Kyrgyzstan, Turkmenistan].

Microcephala subglobosa is atypical of the genus as a whole, which usually has prominent ray florets and disk florets that are obviously inflated at the base. It is known from China by only a single gathering.


太行菊属 $tai$ $hang$ $ju$ $shu$

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

Herbs, perennial, with somewhat woody stem basally. Leaves pinnatisect. Capitula heterogamous, radiate, 1–3 at apex, corymbose. Involucres cup-shaped; phyllaries in 4 rows, with broad scarious margins. Receptacle convex to conical, epleate. Ray florets in 1 row; lamina white or pink. Disk florets many, bisexual, yellow, tubular, 5-lobed. Anthers obtuse at base, with apical lanceolate appendage. Style branches linear, apex truncate. Achenes obovoid, 3- or 4-ribed. Pappus represented by 4–6 separate, unequal, mainly abaxial subulate scales.

● One species: China.


太行菊 $tai$ $hang$ $ju$


Herbs, perennial, 10–30 cm tall; stems ascending, purple-red or brown, densely or sparsely appressed pubescent, base somewhat woody. Basal leaves: petiole more than 0.5 cm; leaf blade oval, broadly oval, or elliptic, 2.5–3.5 × 2–2.5 cm, 1- or 2-pinnatisect, both surfaces sparsely pubescent or glabrous; primary lateral segments 2- or 3-paired; ultimate segments linear, or obliquely triangular. Stem leaves similar to basal leaves; uppermost leaves pinnatifid. Capitula 1–3 at apices of branches. Involucre coryliform, ca. 1.5 cm in diam., abaxially glabrous or nearly so; phyllaries in 4 rows, abaxially rather densely pubescent, outer and middle phyllaries linear or oblong, 4–5.5 mm, inner ones narrowly elliptic, 6–7 mm. Ray florets white or pink; lamina linear, ca. 2 cm, apex 3-denticulate. Disk florets yellow, 5-lobed. Achenes obovoid, ca. 1.2 mm, 3–5-ribbed. Corona scales 4–6, mainly abaxial.

● On rocks of mountain slopes, cliffs; 800–1200 m. Hebei, He- nan, Shanxi.

The capitula are used to treat diseases of the liver.


百花蒿属 $bai$ $hua$ $hao$ $shu$

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

Elachanthemum Y. Ling & Y. R. Ling.

Herbs, annual. Leaves opposite or alternate, pinnatisect, few lobed or entire. Capitula hemispheric or globose, homogamous, discoid, laxly corymbose or solitary at apex of branches. Involucres hemispheric or cupular-hemispheric; phyllaries in 3–5 rows, herbaceous, margin broadly scarious. Receptacle convex-subcuneal, epleate. Florets tubular, bisexual, 5-lobed, with distinct tube and ± crateriform limb. Anther obtuse at base, with apical acuminate-triangular appendage. Style branches linear, apex truncate. Achenes obliquely obovoid to narrowly obovoid-oblanceolate, densely glandular, striate. Pappus absent.
Two species: China, Mongolia; two species in China.

Oberprieter et al. (in Kadereit & C. Jeffrey, Fam. Gen. Vasc. Pl. 8: 349, 357, 364. 2007) accepted Elachanthemum as a distinct genus on the basis of the smooth pollen, which placed it in a different group of genera from Stilpnolepis.

1a. Capitula 8–20 mm in diam., nodding or declined; phyllaries abaxially glabrous, without midrib; lateral leaf segments grouped at leaf base ................................................................. 1. S. centiflora

1b. Capitula 5–6 mm in diam.; phyllaries abaxially floccose, with green midrib; lateral leaf segments uniformly distributed along leaf ............................................................... 2. S. intricata


Herbs, annual, ca. 40 cm tall, with robust fusiform taproots; stems erect, striate, corymbosely branched in upper part, pubescent. Leaves sessile; leaf blade narrowly lanceolate to linear, 3.5–10 × 0.2–0.4 cm, pinnatisect, both surfaces sparsely pubescent; lateral segments 2- or 3-paired, crowded at base of leaf, stipuliform, short, linear; terminal segments linear, long. Synflorescence a lax, flat-topped cyme. Capitula nodding or declined; peduncle 1.5–3 cm. involucrums cupular-hemispheric, 0.8–2 cm in diam.; phyllaries in 4 or 5 rows, scarious margin broad, outer phyllaries broadly ovate, ca. 7 mm, middle and inner ones ovate or broadly obovate, ca. as long as outer ones or somewhat shorter. Florets many, bisexual, fertile, yellow, 5-lobed, with distinct tube and bowl-shaped limb. Achenes narrowly obovoid-triangular, 5–6 mm, densely glandular, inconspicuously striate. Pappus absent.

Dunes; 1100–1300 m. Gansu, Nei Mongol, Ningxia, Shaanxi [Mongolia].


Herbs, annual, with robust taproots; stems much branched from base, reddish or yellow-brown, sparsely pubescent. Leaves sessile; leaf blade elliptic or broadly ovate, 1–3 × 0.5–1.5 cm, pinnatisect, both surfaces sparsely pubescent; lateral segments 3-paired, linear; distal leaves 3–5-divided or entire. Synflorescences cymose, forming lax panicle. Capitula pedunculate. involucres hemispheric, 5–6 mm in diam.; phyllaries in 3–5 rows, ovate or broadly ovate, equal or outer ones somewhat shorter, with green midvein, abaxially sparsely pilose, scarious margin hyaline. Florets many, bisexual, yellow, 5-lobed, with a distinct tube and cupular limb. Achenes obliquely obovoid, 10–20-striate. Fl. and fr. Sep.–Oct.

Deserts, steppes; 1300–1400 m. Gansu, Nei Mongol, Ningxia, Qinghai, Xinjiang [Mongolia].


Milfoil; Ptarmica Miller.

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

Millefolium Miller; Ptarmica Miller.

Herbs, perennial, usually rhizomatous; indumentum of basified or sometimes submedifixed hairs. Leaves alternate, pinnatifid to pinnatisect, rarely entire. Synflorescences cymose, usually ± flat-topped panicles, rarely capitula few together or solitary. Capitula relatively small, heterogamous, radiate, rarely homogamous and discoid. involucre oblong, ovoid, or hemispheric; phyllaries in 2 or 3 rows, scarious margins brown- or yellowish white. Receptacle flat to convex, conical or rarely much elongated, palescent. Marginal florets in 1 row, female; lamina white, pink, red, or yellow, rather short and wide, occasionally absent. Disk florets yellow or pink, bisexual, corolla tubular, apex 5-lobed, = winged, flattened, basally slightly saccate around achene especially adaxially. Anther bases obtuse, apical appendage lanceolate. Achenes dorsiventrally flattened with 2 lateral ribs. Pappus absent.

About 200 species: mostly in Europe and temperate Asia; 11 species (one endemic, one introduced) in China.


1a. Leaves entire, margin serrulate.

2a. Leaves glabrous; ray floret lamina ca. 7 × 5 mm; paleae yellow villous at apex .............................................................................. 4. A. acuminata

2b. Leaves densely pubescent, depressed gland-dotted; ray floret lamina 3.2–3.5 × 3–3.8 mm; paleae white

villosus at apex .................................................................................. 5. A. salicifolia

1b. Leaves pinnately to tripinnately divided.

3a. Leaves pinnately divided.
4a. Ray floret lamina 4.7 × 4.6 mm; segments or pinnae of leaves minutely spiniform-serrulate or 1- or 2-dentate or lobed.
5a. Rhizomes short; leaves pinnatisect; capitula 5–8 or more ................................................................. 6. A. impatiens
5b. Rhizomes long and slender; leaves pinnatifid or pinnatipartite to pinnatisect; capitula 3–5 .......... 7. A. ledebourii
4b. Ray floret lamina 0.8–2.5 × 1–3 mm; pinnae of leaves with unequal teeth.
6a. Involucres subglobose or broadly ovoid, (4–)5–7 mm in diam.; phyllaries with broad brown margin; leaves sparsely gland-dotted or not gland-dotted ........................................................................................................... 8. A. alpina
6b. Involucres ovoid, 3.5–4 mm in diam.; phyllaries with narrow yellow or brown margin; leaves densely gland-dotted .......................................................................................................................... 9. A. ptarmicoide
3b. Leaves bipinnately or tripinnately divided.
7a. Leaves 2-pinnatisect, primary segments elliptic-lanceolate, 5–10 × 2–4 mm, ultimate segments few, lanceolate, not overlapping.
8a. Involucres 4–6 mm in diam. .................................................................................................................. 10. A. wilsoniana
8b. Involucres 1.5–2(–2.5) mm in diam. ....................................................................................................... 11. A. nobilis
7b. Leaves mostly tripinnatisect, lower stem leaf blades very narrow, ultimate segments 1–2(–3) mm, overlapping transversely.
9a. Rachis 1.5–2 mm wide; ultimate segments of leaves relatively broad, lanceolate, rarely linear, 0.3–0.5 mm wide .............................................................................................................................. 1. A. millefolium
9b. Rachis 0.5–1 mm wide; ultimate segments of leaves relatively narrow, 0.1–0.5 mm wide, filiform-linear or linear to lanceolate.
10a. Ray floret lamina yellowish white, relatively small; involucres narrowly oblong, 4–4.5 × 2–2.5 mm; phyllaries sometimes with brownish narrow margin .............................................................................................................................. 2. A. setacea
10b. Ray floret lamina pink, rarely turning white, relatively large; involucres oblong, 4–5 × 2.5–3 mm, with conspicuous brown or brownish margin ................................................................................. 3. A. asiatica


Achillea millefolium Linnaeus var. setacea (Waldstein & Kitaibel) W. D. J. Koch.

Herbs, perennial, 30–70 cm tall, with procumbent slender rhizomes; stems erect, unbranched or few branched in upper part, usually with short sterile branches at leaf axes above middle, white villous, especially in lower part. Basal leaves petiolate; leaf blade linear-lanceolate, rarely linear-oblong, 8–20 × 1–2 cm, (2 or)3-pinnatisect, both surfaces villous; primary segments many, 1–1.5 mm apart; ultimate segments filiform-linear or linear-lanceolate to lanceolate, 0.5–1.5 × 0.1–0.2 mm, apex cartilaginous-mucronulate; middle and upper stem leaves similar, sessile, gradually smaller. Synflorescence a terminal flat-topped panicle 2.5–7 cm in diam. Capitula many. Involucres narrowly oblong or ovoid-oblong, 4–4.5 × 2–2.5 mm; phyllaries in 3 rows, yellowish green, midvein greenish, convex, abaxially brownish pilose, oblong-ovate to oblong, 2–4 × 0.8–1.2 mm, scarious margin sometimes with narrow pale brown edge, apex somewhat acute or obtuse. Paleae oblong-lanceolate to lanceolate, glabrous or appressed pilose on upper part. Ray florets 5; lamina yellowish white, semiorbicular or suborbicular, 1.2–1.3 × 1.3–1.8 mm, apex subtruncate or 3-dentate. Disk florets yellow, tubular, 5-lobed. Achenes oblong-cuneate, 1.8–2 cm, 0.8 mm, with narrow lateral ribs. Corona absent. Fl. and fr. Jul–Aug. 2n = 18, 36.

Wastelands, forest margins, grasslands on mountain slopes, meadows, river valleys; 500–2400 m. Heilongjiang, Xinjiang [Kazakhstan, Mongolia, Russia; N Africa, SW Asia, Europe].


亚洲蓍 ya zhou shi

Achillea millefolium Linnaeus var. mandschurea Kitamura; A. setacea Waldstein & Kitaibel subsp. asiatica (Sergievskaya) Voroschilov.
Herbs, perennial, (4–)18–60 cm tall, with procumbent slender rhizomes; stems erect, unbranched or upper parts few branched, usually with sterile branches at leaf axils, striate, conspicuously lanate-villosus. Basal stem leaves petiolate or subsessile; leaf blade linear-oblong, linear-lanceolate, or linear-oblan-ceolate, 2–2.2 mm, with lateral ribs; primary segments many, 1–1.5 mm apart; ultimate segments linear to lanceolate, 0.5–2 mm, apex cartilaginous-mucronulate; middle and upper stem leaves similar, sessile, progressively smaller. Synflorescence a dense, rarely lax, flat-topped panicle. Capitula many. Involucre oblong, 4–5 × 2.5–3 mm; phyllaries in 3 or 4 rows, ovate or oblong to lanceolate, 1.5–4 × 0.8–1.5 mm, scarious, midvein yellow-green, convex, margin brown or brownish. Paleae oblong-lanceolate, scarious, margin hyaline, sparsely pilose in upper part. Ray florets 5; lamina pink or violet-red, rarely turning white, suborbicide, 2.5–2–2.2 mm. Disk florets tubular, 5-lobed. Achenes ceolate, (2 or)3-pinnatisect, abaxially densely villous, adaxially sparsely villous. Corona absent. Fl. and fr. Jul–Aug.

Grasslands on mountain slopes, moist forest margins, by rivers; 600–2600 m. Hebei, Heilongjiang, Liaoning, Nei Mongol, Xinjiang [Kazakhstan, Mongolia, Russia].


Herbs, perennial, 30–100 cm tall; stems solitary, erect, corymbose branched, lower part glabrous, upper part densely pubescent. Basal and lower stem leaves withered by anthesis. Middle stem leaves sessile; leaf blade lanceolate or linear-lanceolate, 3–8(–11) × 0.4–0.9 cm, both surfaces pubescent at first, glabrescent or pubescent along veins abaxially, base slightly attenuate, margin double-serrulate, apex acuminate. Synflorescence a lax terminal flat-topped panicle. Capitula rather many. Involucre hemispheric, ca. 5 × 9 mm; phyllaries in 3 rows, broadly lanceolate, 3.5–4.5 × ca. 1.8 mm, abaxially sparsely villous, margin scarious, midvein convex, red-brown or deep brown. Paleae lanceolate, apex sparsely villous. Ray florets 8; lamina white, broadly elliptic, apex 3-crenate. Disk florets white, tubular. Achenes oblong-lanceolate, ca. 2.5 × 1.3 mm, with winged lateral ribs. Corona absent. Fl. and fr. Jul–Sep. 2n = 18, 36.

Herbs, perennial, 40–60 cm tall, with short rhizomes; stems erect, few branched in upper part, pubescent above middle. Middle stem leaves sessile; leaf blade lanceolate, 1.5–4.5 × 0.3–0.9 cm, both surfaces sparsely pilose; rachis 1–2 mm wide, segments linear-lanceolate, margin entire, minutely serrulate or with 1 or 2 teeth on one side, apex acute. Upper stem leaves similar, gradually smaller. Synflorescence a terminal flat-topped cyme. Capitula 5–8 or more. Involucre hemispheric, 5–7 mm in diam.; phyllaries in 3 rows, broadly lanceolate, 3.5–4.5 × ca. 1.8 mm, abaxially sparsely villous, margin scarious, midvein convex, red-brown or deep brown. Paleae lanceolate, apex sparsely villous. Ray florets 8; lamina white, broadly elliptic, apex 3-crenate. Disk florets white, tubular. Achenes oblong-lanceolate, ca. 2.5 × 1.3 mm, with winged lateral ribs. Corona absent. Fl. and fr. Jul–Aug. 2n = 18.

Herbs, perennial, ca. 40 cm tall, with long slender rhizomes; stems erect, corymbose branched in upper part, pilose above middle. Middle stem leaves sessile; leaf blade lanceolate, 1.5–4 × 0.5–0.9 cm, pinnatifoliated or pinnatisect or pinnatifidate, both surfaces sparsely villous, rachis 1.5–3 mm wide; lobes or segments linear-lanceolate, basal ones large, margin minutely serrulate, sometimes 1-dentate on one side, apex acuminate or acute. Synflorescence a terminal, clustered, flat-topped cyme. Capitula 3–5. Involucres hemispheric, 5–6 mm in diam.; phyllaries in 3 rows, ovate or broadly elliptic, 3.5–2 × 2–3 mm, scarious margin broad, midvein deep brown, convex. Paleae brown, lanceolate-elliptic, 4.5 × ca. 1.5 mm, scarious, apex sparsely white villous. Ray florets 8; lamina white, broadly elliptic, apex 3-crenate. Disk florets white, tubular. Achenes broadly lanceolate, ca. 2 mm, with white lateral ribs. Corona absent. Fl. and fr. Jul–Sep.
Forest understories; 2200–2500 m. Xinjiang [Kazakhstan, Russia].


高山蓍 gao shan shi

Achillea mongolica Fischer ex Sprengel; A. sibirica Ledebour; A. sibirica subsp. mongolica (Fischer ex Sprengel) Heimerl; A. sinensis Heimerl; Ptarmica mongolica (Fischer ex Sprengel) Candolle; P. sibirica (Ledebour) Ledebour.

Herbs, perennial, 30–80 cm tall, with short rhizomes; stems erect, branched in upper part, usually with sterile branches at leaf axils above middle, sparsely or densely pilose. Basal stem leaves withered by anthesis. Middle stem leaves sessile; leaf blade linear-lanceolate, 6–10 × 0.7–1.7 cm, pectinately pinna-tiolobed or pinnatipartite, abaxially densely villous, adaxially sparingly villous; lobes linear or linear-lanceolate, basally amplexicaul, margin unequally serrulate, apex acute; upper stem leaves similar, progressively smaller. Synflorescence a dense terminal flat-topped panicle. Capitula many. Involucres broadly campanulate or hemispheric, 5–10 × 2–4 mm; secondary segments few, lanceolate, proximal ones large, distal ones small; rachis ca. 1.5 mm wide, margin entire or dentate. Capitula many, in an apical compound corymb. Involucres broadly campanulate or hemispheric, 4–6 mm in diam.; phyllaries in 3 rows, overlapping, outer ovate-lanceolate, short, ca. 2.3 × 1.2 mm, apex slightly acute, middle ones ovate-lanceolate, ca. 2.5 × 1.8 mm, inner ones long elliptic, ca. 4 × 1.8 mm, apex obtuse or rounded; midvein convex. Paleae similar to phyllaries. Ray florets 6–8; lamina white, broadly elliptic, 6–8 × 0.5–0.7 cm, pectinately pinnatifid or sub-pinnatisect; primary segments many, close together, elliptic-lanceolate, 5–10 × 2–4 mm; secondary segments few, lanceolate, proximal ones large, distal ones small; rachis ca. 1.5 mm wide, margin entire or dentate. Capitula many, in an apical compound cor-ymb. Involucres broadly campanulate or hemispheric, 4–6 mm in diam.; phyllaries in 3 rows, overlapping, outer ovate-lanceolate, short, ca. 2.3 × 1.2 mm, apex slightly acute, middle ones ovate-lanceolate, ca. 2.5 × 1.8 mm, inner ones long elliptic, ca. 4 × 1.8 mm, apex obtuse or rounded; midvein convex. Paleae lanceolate, ca. 4.5 mm, sparingly villous in upper part. Ray florets 6–8(–16); lamina white, occasionally with pinkish margin, ca. 2.2 × 2.2 mm, apex deeply or shallowly 3-denticate. Disk florets yellowish or white, tubular. Achenes oblong-elliptic, ca. 2.5 × 1.1 mm, with winged lateral ribs. Pappus absent. Fl. and fr. Jul–Sep. 2n = 36.

Grasslands on mountain slopes, forest margins, under thickets, meadows, river valleys; 800–2400 m. Anhui, Gansu, Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol, Ningxia, Qinghai, Shaanxi, Shanxi, Sichuan, Yunnan [Japan, Korea, Mongolia, Nepal, Russia].


短褐蓍 duan ban shi

Achillea sibirica var. discoidea Regel; A. sibirica var. ptarmicoides (Maximowicz) Makino; Ptarmica ptarmicoides (Maximowicz) Voroschilov.

Herbs, perennial, 70–100 cm tall, with short rhizomes; stems erect, usually unbranched, middle leaf axis with sterile branches, sparsely white pilose. Basal stem leaves withered by anthesis. Middle stem leaves sessile; leaf blade linear or linear-lanceolate, 6–8 × 0.5–0.7 cm, pectinately pinna-tiolobed or pinnatipartite, abaxially sparsely pilose, adaxially densely pilose, densely glandular punctuate; pinnae linear, margin irregularly serrulate, apex acute. Upper stem leaves similar, gradually smaller. Synflorescence a dense terminal flat-topped panicle. Capitula many. Involucres campanulate, 5–6 × 3.5–4 mm; phyllaries in 3 rows, scarious margin yellowish or brownish, outer phyllaries ovate, 1.5–2 × 1.2–1.5 mm, apex somewhat acute, middle ones elliptic, ca. 2.8 × 1.5 mm, apex obtuse, inner ones oblong, ca. 3.2 × 2 mm. Palea similar to phyllaries. Ray florets 6–8; lamina yellowish white, broadly elliptic, very small, 0.8–1.5 × ca. 1.1 mm, apex 3-crenate. Disk florets white, tubular, 5-lobed. Achenes oblong or broadly obovate, ca. 2.2 × 1.2 mm, with white lateral ribs. Corona absent. Fl. and fr. Jul–Sep.

River valleys, meadows, mountain slopes, under thickets; 200–400 m. Hebei, Heilongjiang, Liaoning, Nei Mongol [Japan, Korea, Mongolia, Russia].


云南蓍 yun nan shi


Herbs, perennial, with short rhizomes. Stems erect, 35–100 cm tall, densely villous above middle, glabrescent in lower part, usually corymbose branched, with sterile branches at leaf axils in upper part. Proximal stem leaves withered by anthesis. Middle stem leaves sessile; leaf blade oblong, 4–6.5 × 1–2 cm, abaxially sparsely pilose, adaxially densely pilose, 2-pinnatisect; primary segments many, close together, elliptic-lanceolate, 5–10 × 2–4 mm; secondary segments few, lanceolate, proximal ones large, distal ones small; rachis ca. 1.5 mm wide, margin entire or dentate. Capitula many, in an apical compound cor-ymb. Involucres broadly campanulate or hemispheric, 4–6 mm in diam.; phyllaries in 3 rows, overlapping, outer ovate-lanceolate, short, ca. 2.3 × 1.2 mm, apex slightly acute, middle ones ovate-lanceolate, ca. 2.5 × 1.8 mm, inner ones long elliptic, ca. 4 × 1.8 mm, apex obtuse or rounded; midvein convex. Paleae lanceolate, ca. 4.5 mm, sparingly villous in upper part. Ray florets 6–8(–16); lamina white, occasionally with pinkish margin, ca. 2.2 × 2.2 mm, apex deeply or shallowly 3-denticate. Disk florets yellowish or white, tubular. Achenes oblong-cuneate, ca. 2.5 × 1.1 mm, with winged lateral ribs. Pappus absent. Fl. and fr. Jul–Sep.

Grasslands on mountain slopes, under thickets; 400–3700 m. Gansu, Guizhou, Hubei, Shaanxi, Shanxi, Sichuan, Yunnan.

The entire plant is used in medicines to stop bleeding, to alleviate pain, and for strengthening the stomach.


壮观蓍 zhuang guan shi


Herbs, perennial, (15–)25–35(–50) cm tall, with short rhizomes; stems few, erect or slightly ascending, simple or branched near top, densely lanate-floccose, densely leafy. Middle stem leaves sessile; leaf blade ovate or oblong-elliptic, (2–)3–6 cm, 2-pinnatisect, lanate-floccose; primary segments few, distant especially toward base, linear, 10–15 mm; secondary segments lanceolate or linear, pinnatifid, lobules lanceolate, 0.5–1(–2) mm. Synflorescence a dense, terminal, rounded panicle. Capitula many. Involucres ovoid, less often cylindrical-ovoid, 1.5–2(–2.5) mm in diam.; phyllaries keeled, pale, scarious margin narrow, usually white. Paleae white, membranous, lanceolate, slightly shorter than floret. Ray floret lamina white or yellowish white, orbicular-reniform to semicircular, (0.6–)1.6–1.9 mm, apex truncate, unequally 3-toothed. Achenes oblong, ca. 1 mm.

Open grasslands, forest margins, naturalizing in disturbed sites. Xinjiang [Kazakhstan, Russia, Turkmenistan; SW Asia (Caucasus, Turkey), C and S Europe].
**168. ANTHEMIS Linnaeus, Sp. Pl. 2: 893. 1753.**

**春黄菊属 chun huang ju shu**

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

Herbs, annual or perennial, or subshrubs; indumentum of medifixed hairs. Leaves alternate, pinnatisect to variously lobed, occasionally entire. Synflorescences cymose; capitula solitary or in lax, ± flat-topped panicles, pedunculate, heterogamous and radiate, rarely homogamous and discoid. Involucres usually ± hemispheric to ovoid; phyllaries in 3 rows, scarious margins narrow. Receptacle convex to narrowly conical, paleate, rarely basally or completely epaneulate; palea oblong or subulate, scarious, apex truncate or acute to acuminate. Marginal florets in 1 row, female, fertile; lamina white or yellow [or rarely reddish]. Disk florets many, yellow, rarely reddish, bisexual; corolla tubular, apex 5-lobed. Anther bases obtuse. Style branches truncate. Achenes oblong or obconic, smooth to prismatic to 4 or 5(or 8)-ribbed, dorsiventrally compressed. Corona absent or shallow, often adaxially more developed or forming an adaxial auricle.

About 100(–150) species: mainly in S Europe and SW Asia; one species (introduced) in China.

*Anthemis arvensis* Linnaeus (田春黄菊 tian chun huang ju) is cultivated in E China.

1a. Phyllary margins narrowly scarious; achenes tuberculate; plants fetid ................................................................. 1. *A. cotula*

1b. Phyllary margins broadly scarious; achenes smooth; plants not fetid .................................................. *A. arvensis* (see comment above)


**臭春菊 chou chun huang ju**

*Anthemis foetida* Lamarrck; *Marata cotula* (Linnaeus) Candolle; *M. foetida* (Lamarck) Cassini.

Herbs, annual, (15–)30–50 cm tall, fetid; stems erect, corymbose branched, sparsely pubescent or subglabrescent. Leaves sessile; leaf blade ovate-oblong, 1.5–6 × 0.5–3 cm, 2-pinnatisect; ultimate segments narrowly linear. Capitula terminal, solitary, long pedunculate, 1–2 cm in diam. Involucre hemispheric; phyllaries in 3 rows, oblong, scarious margin narrow, apex obtuse. Ray florets white; lamina 5–14 × 3–6 cm, elliptic. Disk florets yellow, tubular, 5-lobed. Achenes oblong-turbinate, 1–1.5 mm, tuberculate, obscurely 8(–10)-ribbed. Corona absent. Fl. and fr. Jun–Jul. 2n = 18.

Cultivated and possibly naturalized. Nei Mongol [native to N Africa, SW Asia, and Europe; introduced elsewhere].

*Anthemis cotula* has been recorded as a weed from E Mongolia and can be expected to behave similarly in China.

**169. TANACETUM Linnaeus, Sp. Pl. 2: 843. 1753.**

**菊蒿属 ju hao shu**

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

*Gymnocline* Cassini; *Pontia* Bubani; *Pyrethrum* Zimm.

Herbs, perennial, subshrubs, or shrubs, lower parts somewhat woody; indumentum absent or of basifixed and/or medifixed hairs. Leaves alternate, rarely rosulate, pinnatifid to 3-pinnatisect, rarely entire. Synflorescences cymose, mostly flat-topped, sometimes reduced to a solitary capitulum. Capitula heterogamous or homogamous, radiate, disciform or discoid. Involucres campanulate; phyllaries in 3–5 rows, scarious margins broad or narrow, usually brown, less often white. Receptacle convex or flat, epaneulate, usually pilose. Marginal florets in 1, very rarely 2, rows, or absent, female, fertile; lamina white or red, less often yellow, or absent, ovate, elliptic, or linear. Disk florets many, yellow, bisexual; corolla tubular, apex 5-lobed. Anther bases obtuse; apical appendage ovate-lanceolate or broadly lanceolate. Style branches linear, apex truncate. Achenes terete or obscurely 3-angled, 5–10(–12)-ribbed, often with sessile glands, never with myxogenic cells. Corona present, 0.1–0.4 mm, sometimes of free scales, rarely an adaxial auricle (very rarely absent).

About 100 species: N Africa, C Asia, 19 species (two endemic, two introduced) in China.

*Tanacetum parthenifolium* (Willdenow) Schultz Bipontinus (Tanacetum, 56. 1844; *Pyrethrum parthenifolium* Willdenow, Sp. Pl. 3: 2156. 1803, “parthenifolium”; *卡房匹菊 san fang pi ju*), native to C and SW Asia, and *T. parthenium* (Linnaeus) Schultz Bipontinus (Tanacetum, 55. 1844; *Matricaria parthenium* Linnaeus, Sp. Pl. 2: 890. 1753; *短舌匹菊 duan she pi ju*), originating within Europe, possibly through selection from *T. parthenifolium*, are cultivated as ornamentals in China and are included in the following key. *Tanacetum parthenium* is used medicinally.

A gathering by Karelin and Kirilov from Xinjiang (“Sinkiang: Songaria-Kirghisici”), not seen by the present authors, has been named as *Pyrethrum achilleifolium* M. Bieberstein (Fl. Taur.-Caucas. 2: 327. 1808; *Tanacetum achilleifolium* (M. Bieberstein) Schultz Bipontinus, Tanacetum, 47. 1844), a C Asian species recorded west of the W Altai. It would key out below as *T. santolina*, from which it differs by its phyllaries broader, pubescent only at their bases, and with broader membranous margins.
1a. Ray florets absent: capitula disciform or discoid.
2a. Florets orange-red; plants 7–25 cm tall ............................................. 10. *T. tatsuianense*
2b. Florets yellow; plants 30–150 cm tall.
3a. Synflorescence with (5–)10–70(–100) capitula; stem leaves elliptic or elliptic-ovate, to 20 cm, ultimate segments ovate, obliquely triangular, or narrowly elliptic; capitula disciform ........................................... 1. *T. vulgaris*
3b. Synflorescence with 3–10(–12) capitula; stem leaves linear-oblong or oblong, 1–9 cm, ultimate segments linear or oblong; capitula discoid.
4a. Leaves less than 3 cm, with inconspicuous or short petioles, ultimate segments oblong, apex obtuse ........................................................................................................................................... 18. *T. artemisioides*
4b. Leaves more than 4 cm, with long petioles, ultimate segments linear, acute ........................................... 19. *T. falconeri*
1b. Ray florets conspicuous: capitula radiate.
5a. Ray florets yellow.
6a. Capitula 1 per stem; indumentum with curved simple hairs only ............................................. 11. *T. atkinsonii*
6b. Capitula 3–16 per stem; indumentum with a mixture of simple hairs and T-shaped hairs.
7a. Basal leaves inconspicuously tripinnatisect, petiole to ca. 2.5 cm ........................................... 6. *T. scopulorum*
7b. Basal leaves 2-pinnatisect, petiole 3–8 cm.
8a. Capitula 3–7, densely corymbose or compound-corymbose; peduncle becoming thick at apex, 0.5–1.5 cm ........................................................................................................................................... 3. *T. crassipes*
8b. Capitula 5–16, laxly irregularly corymbose; peduncle 1–10 cm.
9a. Leaves narrowly elliptic or narrowly linear-elliptic; involucre 7–17 mm in diam. ............. 4. *T. barclayanum*
9b. Leaves linear or broadly linear; involucre 4–7 mm in diam. ................................................ 5. *T. santolina*
5b. Ray florets white, pink, red, orange-red, or purplish.
10a. Ray florets red, orange-red, or purplish.
11a. Plants 25–50 cm tall; basal leaves 2.5–4 cm wide; outer phyllaries ca. 3.5 mm ..................... 8. *T. coccineum*
11b. Plants 7–35 cm tall; basal leaves 1–2 cm wide; outer phyllaries 5–6 mm.
12a. Ray florets orange-red; corona ca. 0.1 mm, divided to base ................................................. 10. *T. tatsuianense*
12b. Ray florets red or purple-red; corona 0.3–0.5 mm, divided for half length .................. 16. *T. richterioides*
10b. Ray florets white or pink.
13a. Small subshrubs; ray florets pink ................................................................................... 9. *T. petraeum*
13b. Perennial herbs; ray florets white (sometimes pink in *T. kaschgarianum*).
14a. Stems and leaves with T-shaped or forked hairs, sometimes mixed with simple hairs.
15a. Basal leaves with petiole 6–9 cm, blade ca. 10 × 2.5 cm; stems and leaves green or gray-green; indumentum spreading, hairs a mixture of simple and T-shaped hairs; involucres campanulate ............................................. 2. *T. tanacetoides*
15b. Basal leaves with petiole 10–20 cm, blade 1.5–4 × 1–2 cm; stems and leaves silvery gray; indumentum appressed, all hairs T-shaped or forked; involucres shallowly cup-shaped ........................................................................................................................................... 7. *T. cinerariifolium*
14b. Stems and leaves with simple hairs only, sometimes these glandular.
16a. Involucres straw-colored; scarious margins of phyllaries narrowly white; leaves petiolate (cultivated ornamentals).
17a. Plants green or deep green; ray floret lamina 7–10 mm; achenes ca. 3 mm ...................... 17. *T. kaschgarianum*
17b. Plants yellow-green; ray floret lamina 3–6 mm; achenes ca. 1.2 mm ........................................ 17. *T. partheniifolium* (see comment above)
16b. Involucres not straw-colored; scarious margins of phyllaries dark brown or brown; stem leaves sessile or shortly petiolate.
18a. Leaf surfaces gray-white; receptacle pilose with easily shed hairs .......... 17. *T. kaschgarianum*
18b. Leaf surfaces green; receptacle persistently pilose.
19a. Capitula 2–7, very rarely solitary.
20a. Indumentum with a mixture of glandular and eglandular hairs; ultimate segments of leaves filiform ............................................. 14. *T. abrotanoides*
20b. Indumentum with glandular hairs only; ultimate segments of leaves linear to obliquely triangular ............................................. 12. *T. alatavicum*
19b. Capitula solitary, very rarely 2 or 3.
21a. Basal leaves 1–2 cm wide; achene corona 1–1.2 mm, divided to base .................................. 15. *T. pulchrum*
21b. Basal leaves 2–5 cm wide; achene corona 0.4–0.7 mm, divided for half length ........... 13. *T. krylovianum*

密头菊蒿 *mi tou ju hao*


Herbs, perennial, 20–60 cm tall, with branched rhizomes; stems solitary or fascicled, upper parts corymbosely branched, sparsely pilose with T-shaped and simple hairs. Basal leaves: petiole 3–5 cm; leaf blade narrowly elliptic, 8–15 × ca. 2 cm, 2-pinnatisect, green or deep green, appressed pilose; primary lateral segments 10–15-paired; ultimate segments linear-elliptic. Stem leaves similar, few, sessile. Synflorescence a dense flat-topped cyme. Capitula 3–7; peduncle 0.5–1.5 cm, apex thicker. Involucre campanulate, 7–10–(14) mm in diam.; phyllaries in 3 or 4 rows, abaxially with simple hairs, outer and middle phyllaries lanceolate, 2.5–4 mm, apex scarios-ampliate, inner ones narrowly linear-elliptic, ca. 4 mm. Ray florets yellow, apex 3-dentate. Achenes ca. 2 mm. Corona ca. 0.3 mm, margin denticulate. Fl. and fr. Jun–Aug.

Rocky slopes, forest understories, grasslands; ca. 2100 m. Xinjiang (Altay Shan) [Kazakhstan, Russia].


散头菊蒿 *san tou ju hao*

*Chrysanthemum santolina* (C. Winkler) B. Fedtschenko; *Pyrethrum kasakhstanicum* Krascheninnikov.

Herbs, perennial, 20–30 cm tall; stems solitary or fascicled, erect, upper parts corymbosely branched. Basal leaves: petiole 6–8 cm; leaf blade linear or broadly linear, 6–8 × 2–3 cm, 2-pinnatisect, both surfaces gray-green, pilose with T-shaped and simple hairs; primary lateral segments 10–12-paired; ultimate segments elliptic to elliptic-ovate. Stem leaves
few, similar to basal leaves, sessile. Synflorescence an irregular flat-topped panicle. Capitula 5–12; peduncle 6–8 cm, not thick-ened. Involucre campanulate, 4–7 mm in diam.; phyllaries in 4 rows, scarious margin narrow, outer phyllaries lanceolate, ca. 1.5 mm, inner ones narrowly linear-elliptic, 3–5 mm. Ray florets yellow. Achenes ca. 2 mm. Corona 0.2–0.4 mm, lobed or serrate. Fl. and fr. Jun.–Aug.

Rocky slopes, moist places on mountain slopes; 1100–2100 m. Xinjiang [Kazakhstan, Russia].


岩菊蒿 yan ju hao


Herbs, perennial, to 35 cm tall, with branched rhizomes; stems solitary or clustered, upper parts shortly corymbose branched, densely or sparsely pilose with T-shaped and simple hairs. Basal leaves: petioles to 2 cm; leaf blade narrowly elliptic or elliptic, 4–8 × 1–2 cm, inconspicuously 3-pinnatisect, both surfaces green or pale gray-green, pilose or sparsely pilose; primary lateral segments 3–5-paired; ultimate segments linear-elliptic or oblanceolate; stem leaves few, sessile. Synflorescence a flat-topped cyme. Capitula 3–6; peduncle 1–8 cm. Involucre campanulate, 7–10 mm in diam.; phyllaries in 4 rows, abaxially villous or pubescent, outer phyllaries lanceolate, ca. 2.5 mm, apex white scarious-amplexicaul, middle and inner ones elliptic to linear-elliptic, 3–5 mm. Ray florets yellow, apex 3– or 4-denticulate. Achenes 2–2.3 mm. Corona 0.2–0.3 mm, margin serrate. Fl. and fr. Jul.–Aug.

Mountain slopes; ca. 700 m. Xinjiang (Altay Shan) [Kazakhstan].

7. Tanacetum cinerariifolium (Treviranus) Schultz Bipontinus, Tanacetum, 58. 1844.

除虫菊 chu chong ju


Herbs, perennial; stems 17–60 cm tall, solitary or fascicled, unbranched or branched from base, pubescent with appressed T-shaped or furcate hairs. Basal leaves: petiole 10–20 cm; leaf blade ovate or elliptic, 1.5–4 × 1–2 cm, both surfaces silvery grayish, appressed pubescent with T-shaped and furcate hairs, 2-pinnatisect; primary segments 3–5-paired; ultimate segments linear or oblong-ovate, margin entire or few dentate. Lower and middle leaves similar, large, shortly petiolate. Capitula apically solitary or 3–10 in apical lax corymb. Involucre cup-shaped, 1.2–1.5 cm in diam.; phyllaries in 4 rows, abaxially pubescent especially in outer ones, outer ones lanceolate, ca. 4 mm, middle and inner ones lanceolate to broadly linear, 5–6 mm, margin narrowly white scarious. Ray florets white; lamina 1.2–1.5 cm, apex truncate or emarginate. Achenes 2.5–3.5 mm. Corona 0.8–1.5 mm, margin shallowly lobed. Fl. and fr. May–Aug. 2n = 18*.

Widely cultivated. Anhui, Guizhou, Hebei, Liaoning, Zhejiang [native to SE Europe; now widely cultivated].

Tanacetum cinerariifolium is widely cultivated, mainly in tropical upland regions, as a source of pyrethrins, which are extracted from the dried capitula and used as insecticides. Pyrethroids are important insecticides obtained by the chemical modification of pyrethrins.


红花除虫菊 hong hua chu chong ju

Chrysanthemum coccineum Willdenow, Sp. Pl. 3: 2144. 1803; C. marschallii Ascherson; Pyrethrum coccineum (Willdenow) Voroshilov.

Herbs, perennial; stems 25–50 cm tall, erect, solitary, unbranched or few branched from base, subglabrous. Basal leaves: petiole 2–10 cm; leaf blade ovate or narrowly elliptic, 4–8 × 2.5–4 cm, 2-pinnatisect, both surfaces sparsely pubescent or glabrous; primary lateral segments 5-paired; ultimate segments triangular, elliptic, or narrowly elliptic. Stem leaves similar, sessile or shortly petiolate; leaves below capitula small, pinnatifid or entire. Capitula solitary, terminal. Involucre cup-shaped, 1–1.5 cm in diam.; phyllaries in 4 rows, scarious margin brown, outer phyllaries lanceolate, ca. 3.5 mm, abaxially glabrous or sparsely pubescent, middle and inner ones narrowly elliptic or linear-oblong-lanceolate, ca. 5 mm, abaxially glabrous. Ray florets red; lamina narrowly elliptic, ca. 1.6 cm, apex 2- or 3-denticulate. Achenes ca. 2.5 mm. Corona 0.1–0.2 mm, margin shallowly obtusely lobed. Fl. and fr. May–Oct. 2n = 36.

Cultivated. Anhui, Hebei [native to SW Asia (Caucasus)].

Tanacetum coccineum is used as an insecticide in the same way as T. cinerariifolium and is also grown as an ornamental.


岩匹菊 yan pi ju


Subshrubs, ca. 35 cm tall; old branches gray; young branches turning purple-red, sparsely pubescent or glabrous. Lower leaves: petiole 1.5 cm; leaf blade ovate, obovate, or oblong-lanceolate, 2–4 × 1.4–2.5 cm, 2-pinnatifidpartite, both surfaces glabrous; primary lateral lobes 2- or 3-paired; ultimate lateral lobes 1-paired, obliquely triangular. Distal leaves pinnatifid, small. Synflorescence an irregular flat-topped cyme with 1–3 capitula. Involucre cylindro-elliptic, 15–20 mm in diam.; phyllaries in 4 rows, abaxially densely pubescent to glabrescent or glabrous, scarious margin brown or brown, outer phyllaries narrowly oblong-lanceolate-elliptic, ca. 6 mm, middle and inner ones lanceolate-triangular or elliptic, 7–8 mm, middle ones glabrescent, inner ones glabrous. Ray florets pink; lamina narrowly elliptic, ca. 2 cm, apex 2-denticulate. Achenes ca. 2 mm. Corona 0.1–0.2 mm, divided 1/2 length or to base. Fl. and fr. Aug.

● On rocks of mountain slopes; 1800–2600 m. Xinjiang (Fuyun).

**Chrysanthemum tatsienense** Bureau & Franchet, J. Bot. (Morot) 5: 72. 1891; *C. jugorum* W. W. Smith; *Pyrethrum tatsienense* (Bureau & Franchet) Y. Ling ex C. Shih.

Herbs, perennial, 12–30 cm tall; stems solitary or clustered, villous with long curved simple hairs especially in upper part and below capitula. Basal leaves: petiole ca. 2.4 cm; leaf blade oblong or narrowly elliptic, 4–10 × 1.5–3 cm, 2-pinnatisect, both surfaces green, sparingly villous or glabrous; primary lateral segments 5–15-paired; ultimate segments linear. Stem leaves similar, sessile. Capitula solitary, terminal. Involucre coriiform, 10–25 mm in diam.; phyllaries in 4 rows, abaxially subglabrous, scarious margin broad, dark brown, outer phyllaries lanceolate, ca. 6 mm, middle and inner ones narrowly elliptic or oblanceolate, 7–9 mm, abaxially glabrous. Ray florets yellow; lamina narrowly elliptic, ca. 1 cm, apex 3-denticulate. Corona shorter than 0.1 mm. Fl. Jul.

Thickets on mountain slopes; 1800–2600 m. Xizang (Yadong) [Bhutan, India (Sikkim), Nepal].


**Chrysanthemum alatavicum** (Herder) Schultz Bipontinus; *Pyrethrum alatavicum* (Herder) O. Fedtschenko & B. Fedtschenko.

Herbs, perennial, 25–100 cm tall; stems solitary and erect or clustered and ascending, upper parts branched, rarely unbranched. Basal leaves: petiole 4–7 cm; leaf blade narrowly elliptic or oblanceolate, 10–18 × 3–4 cm, 2-pinnatisect, both surfaces green, glabrous or sparsely villous, primary lateral segments 5–14-paired; ultimate segments narrowly elliptic, broadly linear, or linear-lanceolate. Middle and distal stem leaves progressively smaller, similar; leaves below capitula pinnately divided or entire. Synflorescence an irregular flat-topped cyme. Capitula (1 or)2–5; peduncle 9–19 cm. Involucre coriiform, 10–18 mm in diam.; phyllaries in 4 rows, scarious margin dark brown, outer phyllaries narrowly lanceolate or linear-lanceolate, ca. 6 mm, middle and inner ones narrowly elliptic or oblanceolate, 7–9 mm, abaxially glabrous. Ray florets white; lamina 1.4–1.6 cm, apex entire. Achenes ca. 2.5 mm. Corona 0.5–1 mm, divided from 1/2 to whole of length. Fl. and fr. Jul.–Aug.

Mountain slopes; 1800–7250 m. Xinjiang [Kazakhstan, Mongolia, Russia].


Herbs, perennial, 30–70 cm tall; stems solitary or clustered, erect, few branched or not, very sparsely pilose. Basal and lower stem leaves petiolate; leaf blade narrowly elliptic, 5–20 × 2–5 cm, 2-pinnatisect, both surfaces green, very sparsely...
pilose or glabrous; primary lateral segments 7–12-paired; ultimate segments obliquely triangular, lanceolate, broadly linear, or linear. Middle and upper stem leaves similar, small, sessile. Synflorescence a ± flat-topped terminal cyme. Capitula 1–3.

Involucrle coryliform, ca. 16 mm in diam.; phyllaries in 4 rows, scariosis margin broad, brown, outer phyllaries ovate, ca. 3 mm, middle and inner ones elliptic or broadly linear, 4–7 mm. Ray florets white; lamina narrowly elliptic, 1.4–2.5 cm, apex 2- or 3-denticulate. Achenes ca. 2.5 mm. Corona 0.4–0.7 mm, lobed for ca. 1/2 length. Fl. and fr. Aug.–Sep.

Forest understories, alkaline soils; 2500–3200 m. Xinjiang [Kazakhstan, Mongolia, Russia].


丝叶匹菊 丝叶匹菊

Pyrethrum abrotanifolium Bunge ex Ledebour, Fl. Ross. 2: 549. 1845; Chrysanthemum abrotanifolium (Bunge ex Ledebour) Krylov.

Herbs, perennial, 30–60 cm tall, with thick rhizomes; stems solitary, erect, upper parts branched, very sparsely pilose or glabrous. Basal and lower stem leaves: petiole 3–5 cm; leaf blade narrowly elliptic or linear-elliptic, ca. 14 × 2–4 cm, 2-pinnatisect, both surfaces green, sparsely villous with glandular and long, curved, simple hairs; primary lateral segments 7–15-paired; ultimate segments filiform. Middle and upper stem leaves similar, gradually smaller, sessile. Synflorescence an irregular flat-topped panicle. Capitula 3–7, pedunculate. Involucrle coryliform, 9–11 mm in diam.; phyllaries in 4 rows, scariosis margin brown or dark brown, outer phyllaries lanceolate, ca. 3.5 mm, abaxially sparsely pilose, middle and inner ones narrowly elliptic to linear-elliptic, 4–5 mm, abaxially glabrous. Ray florets white; lamina narrowly elliptic, 8–12 mm. Achenes ca. 2.2 mm. Corona 0.3–0.5 mm, lobed or divided to 1/2 length. Fl. and fr. Jul.–Aug.

Mountain slopes; above 2000 m. Xinjiang [Kazakhstan, Mongolia, Russia].

15. Tanacetum pulchrum (Ledebour) Schultz Bipontinus, Tanacetean, 49. 1844.

美丽匹菊 美丽匹菊

Pyrethrum pulchrum Ledebour, Icon. Pl. 1: 20. 1829; Chrysanthemum pulchrum (Ledebour) C. Winkler; Tripleurospermum pulchrum (Ledebour) Ruprecht.

Herbs, perennial, 15–30 cm tall, rhizomatous; stems solitary or clustered, unbranched, villous with long, curved, simple hairs, especially in upper part and near capitula. Basal leaves: petiole to 4 cm; leaf blade linear or linear-oblong, 2–10 × 1–2 cm, 2-pinnatisect, both surfaces green, glabrous or somewhat villous; primary lateral segments 6–12-paired; ultimate segments linear or linear-lanceolate. Stem leaves similar, gradually smaller, sessile. Capitulum solitary, terminal; peduncle villous with rather dense and fluffy curved hairs. Involucrle coryliform, 15–25 mm in diam.; phyllaries in 5 rows, scariosis margin broad, dark brown, outer phyllaries ovate or broadly ovate, 5–6 mm, middle and inner ones elliptic or broadly linear, 8–10 mm, outer and middle ones abaxially villous with long simple hairs, inner ones abaxially glabrous. Ray florets white; lamina linear, 1.5–3 cm, apex entire. Achenes 2.5–3 mm. Corona 1–1.2 mm, divided to base. Fl. and fr. Aug.

Kobresia meadows, rocky slopes; ca. 2600 m. Xinjiang (Altay Shan) [Kazakhstan, Mongolia, Russia].


单头匹菊 单头匹菊


Herbs, perennial, 6–35 cm tall, rhizomatous; stems solitary or clustered, erect or ascending, villous especially in upper part and below capitula, hairs long, curved, and simple. Basal and lower stem leaves: petiole to 4 cm; leaf blade narrowly elliptic, 2.5–6 × 1.5–2 cm, 2-pinnatisect, both surfaces green or pale green, sparsely villous; primary lateral segments 4–10-paired; ultimate segments narrowly elliptic. Middle and upper stem leaves similar, gradually smaller. Capitula solitary, terminal, long or shortly pedunculate. Involucrle coryliform, 15–20 mm in diam.; phyllaries in 4 rows, scariosis margin broad, dark brown, outer phyllaries lanceolate, 5–6 mm, abaxially sparsely villous, middle and inner ones narrowly elliptic or oblong-lanceolate, 5–6.5 mm, abaxially glabrous. Ray florets red or purple-red; lamina broadly linear, 1.4–2 cm, apex minutely 3-denticulate. Corona 0.3–0.5 mm, divided for 1/2 length. Fl. Aug.–Sep.

Mountain slopes, meadows, alluvial places; 2000–3100 m. Xinjiang (Junggar Pendi, Tian Shan) [Kazakhstan].


托毛匹菊 托毛匹菊


Herbs, perennial, 15–30 cm tall, with branched rhizomes; stems solitary or clustered, erect or ascending, simple, sparsely villous, hairs long, curved, and simple. Basal and lower stem leaves: petiole to 5.5 cm; leaf blade narrowly elliptic, 3–7 × 1.5–2.5 cm, 2-pinnatisect, both surfaces gray-white, densely hairy; primary lateral segments 4–9-paired; ultimate segments narrowly elliptic or narrowly linear-elliptic. Middle and upper stem leaves similar, sessile; leaves below capitulum pinnatifid. Capitula solitary, terminal. Involucrle coryliform, 10–15 mm in diam.; phyllaries in 3 rows, scariosis margin broad, dark brown, outer phyllaries triangular-lanceolate, ca. 5 mm, middle and inner ones elliptic or narrowly oblong-lanceolate, ca. 6 mm, outer and middle ones abaxially villous, inner ones abaxially glabrous. Receptacle pilose with easily shed hairs. Ray florets white or red; lamina elliptic, 6–10 mm, apex 2- or 3-denticulate. Achenes 2.5–3 mm. Corona ca. 0.8 mm, divided for 1/2 length. Fl. and fr. Jun.–Aug.

**艾状菊蒿 ai zhuang ju hao**

Herbs, perennial, to 60 cm tall, from woody rootstock; stems several, adpressed hairy, glabrescent. Basal and lower stem leaves petiolate. Middle stem leaves subsessile to sessile; leaf blade oblong, 1–2.5×3 cm, ± pinnatisept; ultimate segments 0.5–2 cm, obtuse. Synflorescence a ± lax flat-topped cyme. Capitula 3–10; peduncle short to moderately long. Involucr e ± cupuliform, ca. 5 mm in diam.; phyllaries in 3 rows, pubescent, margin membranous; outer phyllaries lanceolate, ca. 3 mm, apex acute; middle and inner ones oblanceolate to narrowly obovate, 4–5 mm, apex obtuse. Receptacle convex, glabrous. All florets yellow; corolla tubular, 3–4 mm, 5-toothed. Achenes light brown.

2400–2700 m. W Xizang [India, Pakistan].

The type gatherings of this and the following species, *Tanacetum falconeri*, were both collected from the border area between Xizang and Pakistan. The two species are therefore likely to be found within China. The generic position of these species with homogamous capitula needs more detailed investigation.


**西藏菊蒿 xi zang ju hao**

Herbs, perennial or rarely annual, 40–60(-70) cm tall, from woody rootstock; stems sulcate. Basal and lower stem leaves petiolate; leaf blade linear-oblong, 1–9×13 cm including petiole, 2-pinnatisect, both surfaces silky tomentose; ultimate segments linear, acute. Synflorescence a flat-topped cyme. Capitula 6–10×12, homogamous, discoid; peduncle 1.5–3 cm. Involucr e 2–3×4 mm; phyllaries in 4 rows, abaxially softly tomentose, lanate, or pubescent, margin membranous. Receptacle convex, rarely flat. All florets yellow; corolla tubular, 2–4 mm, 5-toothed. Achenes light brown, 1–1.5×3 mm. Corona glandular, entire.

Rocky talus, around lakes, grassy ridges, valley plains; 2000–4000 m. W Xizang [N India (Himachal Pradesh), Pakistan].

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170. **TRIPLEUROSPERMUM** Schultz Bipontinus, Tanacetee, 31. 1844.

**三肋果属 san lei guo shu**

*Chamaemelum* Visiani (1845), not Miller (1754); *Dibothrospermum* Knaf; *Rhytidospermum* Schultz Bipontinus.

Herbs, annual or perennial; indumentum absent or of simple, basifixed hairs. Leaves 2- or 3-pinnatisect. Synflorescences cy- mose; capitula solitary or in ± flat-topped panicles, pedunculate, heterogamous or homogamous, radiate or discoid. Involucres hemispheric; phyllaries in 2–4 rows, scarious margins often narrow, white or pale to dark brown. Receptacle convex to conical, epeate. Marginal florets in 1 row, female, lamina white or rarely pale pink. Disk florets bisexual; corolla tubular, apex 5-lobed; lobes each usually with resin sac. Anther bases obtuse, apical appendage ovate-triangular or oblong. Style branches with apex truncate. Achenes 3-angled, often wrinkled or tuberculare, with 1 adaxial and 2 lateral, and sometimes 1 or 2 abaxial, white ribs, abaxially and apically with (1 or)2×5 distinct resin sacs. Corona present, sometimes forming an auricle, or with a few scales, sometimes absent.

Thirty-eight species: Europe and temperate Asia, a few species in N Africa and North America; five species (one endemic) in China.

1a. Plants perennial, with rhizome; phyllaries with dark brown scarious margins.

2a. Capitula heterogamous, radiate ................................................................. 1. *T. ambiguum*

2b. Capitula homogamous, discoid ............................................................... 2. *T. homogamum*

1b. Plants annual or biennial, without rhizome; phyllaries with white or paler brown scarious margins.

3a. Phyllaries with narrow pale brown scarious margin; achenes tuberculare .................................................. 3. *T. tetragonospermum*

3b. Phyllaries with white or pale brown scarious margin; achenes wrinkled.

4a. Ray floret lamina ca. 10×3.5 mm; corona subentire; leaf blade 2–4×1–2.5 cm .............................................. 4. *T. inodorum*

4b. Ray floret lamina ca. 4×1.5 mm; corona 3-toothed; leaf blade 5.5–9.5×2.5–3 cm ........................................... 5. *T. limosum*


**褐苞三肋果 he bao san lei guo**

*Pyrethrum ambiguum* Ledebour, Fl. Altaic. 4: 118. 1833; *Chamaemelum ambiguum* (Ledebour) Boissier; *Matricaria ambigua* (Ledebour) Krylov.

Herbs, perennial, 15–50 cm tall, rhizomatous; stems erect, unbranched, striate, scattered pilose below capitula. Basal leaves with petiole base dilated; leaf blade lanceolate-oblong or oblong, 3–7×1–2 cm, 2-pinnatisect, both surfaces glabrous; primary lateral segments many paired; ultimate segments linear, sessile, small. Capitula solitary, terminal, 3–4 cm in diam. Involucr e hemispheric, 1–1.5 cm in diam.; phyllaries in 3 rows, abaxially glabrous, scarious margin narrow, dark brown, outer phyllaries lanceolate, 6–6.5 mm, middle ones oblong, inner ones oblanceolate. Ray florets white; lamina ca. 2×4.5 mm. Disk florets yellow, 5-lobed; lobes each with red apical resin sac. Achenes deep brown, ca. 2 mm, tuberculare, with 1 adaxial
and 2 lateral thick whitish ribs, sometimes also 1 or 2 thin abaxial ribs, abaxially and apically with 2 distinct resin sacs. Corona with broad obtuse teeth. Fl. and fr. Jun–Aug.

Sunny mountain slopes, grasslands of river valleys; 700–2600 m. Heilongjiang, Xinjiang (Altay Shan, Tian Shan) [Kazakhstan, Mongolia, Japan, Russia].

## 2. Tripleurospermum homogamum


无舌三肋果  wu she san lei guo

Herbs, perennial, ca. 40 cm tall, with short rhizomes; stems unbranched, striate, conspicuously pubescent below capitula. Basal leaves: petiole short, dilated basally; leaf blade oblanceolate-oblong, 4–6 × 0.8–1.5 cm, pinnatisect to 2-pinnatisect, both surfaces glabrous or very sparsely pubescent; ultimate segments linear, sessile. Distal stem leaves linear, entire. Capitula solitary, terminal, homogamous, discoid; peduncle to 10 cm. involucres hemispheric, ca. 1 cm in diam.; phyllaries in 4 rows, abaxially glabrous or sparsely pubescent, scarious margin dark brown, outer and middle phyllaries lanceolate to oblone-lanceolate, ca. 4 mm, inner ones spatulate-oblanceolate, ca. 3.5 mm. Ray florets absent. Disk florets yellow, 5-lobed, lobes each with a resin sac. Achenes pale brown, 3-angled, ca. 0.2 mm, wrinkled, with 1 adaxial and 2 lateral thick ribs, sometimes 1 or 2 thin abaxial ribs, abaxially and apically with 2 distinct resin sacs. Corona ca. 0.2 mm, 3-lobed.

● Alpine forest margins; ca. 2500 m. N Xinjiang (Burqin).

## 3. Tripleurospermum tetragonospermum


东北三肋果  dong bei san lei guo


Herbs, annual, 40–50 cm tall; stems usually branched from base, striate, upper parts sparsely pubescent, lower part glabrous. Lower and middle stem leaves sessile; leaf blade oblanceolate-oblong or oblong, 5–15 × 2–5 cm, 2- or 3-pinnatisect, both surfaces glabrous; ultimate segments linear-filiform. Distal stem leaves similar, smaller. Capitula solitary, terminal, several per plant, 2–2.5 cm in diam. Involucres hemispheric, 1.2–1.5 cm in diam.; phyllaries in 4 rows, abaxially glabrous, scarious margin narrow, brown, outer ones ovate-oblong, apex obtuse, middle ones narrowly oblong, apex rounded, inner ones lanceolate-oblong, apex obtuse. Ray florets white; lamina ca. 6.5 mm. Disk florets yellow, 5-lobed. Achenes brownish, triquetrous, ca. 1.5 mm, tuberculate, with 1 adaxial and 2 lateral thick ribs, abaxially and apically with 2 distinct resin sacs. Corona ca. 0.2 mm, entire. Fl. and fr. Jun–Aug.

Roadsides, sandy places by rivers; ca. 300 m. Heilongjiang, Liaoning [Japan, Russia].

## 4. Tripleurospermum inodorum

(Linnaeus) Schultz Bipontinus, Tanacetean, 32. 1844.

Herbs, annual or biennial; stems 30–70 cm tall, erect, strigate, glabrous, corymbosely branched in upper 1/2. Middle stem leaves sessile; leaf blade ovate-oblong or oblong, 2–4 × 1–2.5 cm, both surfaces glabrous, 2-pinnatisect; ultimate segments narrowly linear. Distal stem leaves similar, gradually smaller. Capitula several to many, in an apical corymb, 2–3 cm in diam., pedunculate. Involucres hemispheric, 7–10 mm in diam.; phyllaries in 3 or 4 rows, margin narrowly white scarious, outer ones lanceolate, middle and inner ones oblong to oblate-lanceolate. Ray florets white; lamina ca. 1 cm. Disk florets yellow, 5-lobed; lobes each with a resin sac. Achenes brown, triquetrous, ca. 2 mm, wrinkled, with 1 adaxial and 2 lateral thick whitish ribs, abaxially and apically with 2 distinct resin sacs. Corona short, subentire. Fl. and fr. Sep. 2n = 36.

River valleys; ca. 1100 m. Jiangsu, Jilin, Liaoning, N Xinjiang (Tacheng) [Kazakhstan, Russia, Uzbekistan; Europe].

## 5. Tripleurospermum limosum


三肋果 san lei guo


Herbs, annual or biennial; stems 10–35 cm tall, striate, glabrous, unbranched or branched from base. Basal leaves withered by anthesis. Lower and middle stem leaves sessile; leaf blade oblanceolate-oblong or oblong, 5.5–9.5 × 2.5–3 cm, both surfaces glabrous, trippinnatisect; ultimate segments filiform. Distal stem leaves gradually smaller, similar to proximal and middle leaves. Capitula few to many, in an apical corymb, 1–1.5 cm in diam., pedunculate. Involucres hemispheric; phyllaries in 2 or 3 rows, margin white or brownish scarious, outer ones broadly lanceolate, inner ones oblong. Ray florets white; lamina 4(–6) mm. Disk florets yellow, 5-lobed; lobes each with a resin sac. Achenes brown, triquetrous, ca. 2.5 mm, wrinkled, with 1 adaxial and 2 lateral whitish ribs, abaxially and apically with 2 distinct resin sacs. Corona ca. 0.5 mm, 3-lobed. Fl. and fr. Jun–Aug.

Sandy places by rivers and lakes, meadows, dry sandy mountain slopes. Hebei, Heilongjiang, Jilin, Liaoning, Nei Mongol [Japan, Kazakhstan, Korea, Mongolia, Russia, Uzbekistan].

母菊属 **mu ju shu**

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

*Akylopsis* Lehmann; *Chamaomilla* Gray; *Lepidanthus* Nuttall (1841), not Nees (1830), nor Nuttall (1835); *Lepidotheca* Nuttall.

Herbs, annual, usually fragrant; indumentum absent or of simple or basified hairs. Leaves 1- or 2-pinnatisect. Synflorescences cymose, usually ± flat-topped, sometimes reduced to solitary capitulum. Capitula heterogamous or homogamous, radiate or discoid. Involucres coryliform; phyllaries in 2 or 3 rows. Receptacle conical to subulate, epealeate. Marginal florets when present in 1 row, female, fertile; lamina white. Disk florets yellow or pale green, bisexual; corolla tubular, apex 4- or 5-lobed. Anther bases obtuse; apical appendage triangular. Style branches linear, apex truncate. Achenes small, terete, slightly dorsiventrally compressed, adaxially with 3–5 thin ribs. Corona small or absent or sometimes represented by an adaxial auricle particularly in ray achenes.

About seven species: N Africa, SW and temperate Asia, Europe, North America; two species in China.


母菊 **mu ju**

*Chamaelum chamomilla* (Linnaeus) E. H. L. Krause; *Chamaomilla recutita* (Linnaeus) Rauschert; *C. vulgaris* Gray; *Chrysanthemum chamomilla* (Linnaeus) Bernhardi; *C. suaveolens* (Linnaeus) Cavanilles; *Matricaria chamomilla var. recutita* (Linnaeus) Fiori; *M. chamomilla f. suaveolens* (Linnaeus) Fiori & Paololetti; *M. recutita* Linnaeus; *M. suaveolens* Linnaeus.

Herbs, annual or short-lived perennial, glabrous. Stems (10–)30–40 cm tall, erect, stricate, much branched in upper part. Proximal stem leaves sessile; leaf blade oblong or ob lanceolate, (1.5–)3–4–(6) × (0.5–)1.5–2 cm, 2-pinnatisect; ultimate segments linear, apex mucronulate. Distal stem leaves similar to proximal leaves, ovate or long ovate. Capitula heterogamous, 1–1.5 cm in diam., apically corymbose, pedunculate; peduncle 3–6 cm. Involucres cup-shaped; phyllaries in 2 rows, margin broadly white scarious, apex obtuse. Ray florets white; lamina ca. 6 mm. Disk florets many, yellow, tubular. Achenes 0.8–1 mm, with 5 mainly adaxial thin ribs. Corona absent. Fl. and fr. May–Jul. 2n = 18.

Near fields, forests, above valleys; 1800–3300 m. Anhui, Hebei, Jiangsu, Liaoning, Shaanxi, Shandong, Sichuan, Xinjiang [Kazakhstan, Mongolia, Russia, Uzbekistan; Europe, North America].

*Matricaria chamomilla* is cultivated as an ornamental in Beijing and Shanghai. Capitula of this species are used medicinally to induce sweat and relieve muscular spasms. The entire plant contains large amounts of Vitamins A and C.


同花母菊 **tong hua mu ju**


Herbs, annual. Stems 5–30 cm tall, erect or ascending, branched in upper part or from base, glabrous or sparsely pubescent below capitula. Stem leaves sessile; leaf blade oblong or ob lanceolate, 2–3 × 0.8–1 cm, 2-pinnatisect; ultimate segments shortly linear, both surfaces glabrous. Capitula homogamous, irregularly corymbose or solitary at apex of branches, pedunculate; peduncle 0.5–1 cm. Involucres cup-shaped; phyllaries in 3 rows, equal, oblong, abaxially glabrous, scarious margin hyaline, apex obtuse. All florets bisexual, pale yellow-green, tubular, 5-lobed. Achenes oblong, somewhat curved, ca. 1.5 mm, apex obliquely truncate, with 2 or 3 adaxial thin white ribs and 1 red thin stripe on each side. Pappus represented by a white corona. Fl. and fr. Jul. 2n = 18.

Forests, roadsides, near houses. Jilin (Baicheng, Hunchun), Liaoning, Nei Mongol [Bhutan, Japan, Kazakhstan, Korea, Russia; N Asia, Europe, North America].


茼蒿属 **tong hao shu**

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

*Ismelia* Cassini; *Xanthophalum* Schultz Bipontinus.

Herbs, annual; indumentum absent or of simple, basified hairs. Leaves alternate, pinnatisect or margin dentate. Synflorescences cymose, usually ± flat-topped or reduced to solitary terminal capitulum. Capitula pedunculate, heterogamous, radiate. Involucre cup-shaped; phyllaries in 4 rows, rigidly herbaceous. Receptacle convex, epealeate. Marginal florets in 1 row, female, fertile; lamina yellow or yellow and white. Disk florets yellow, bisexual; corolla tubular, apex 5-lobed. Anther bases obtuse; apical appendage ovate-elliptic. Style branches linear, apex truncate. Ray achenes 3-angled, laterally winged, adaxially narrowly winged or ribbed; corona absent. Disk achenes prismatic with a narrow adaxial wing or terete; corona absent.
Three species: Mediterranean region, introduced elsewhere as weeds or cultivated as an ornamental or as vegetables; three species (all introduced) in China.

1a. Ray achenes narrowly 2-winged; leaves irregularly dentate or rarely pinnatifid ......................... 3. G. segetum
1b. Ray achenes widely 3-winged; leaves bipinnately divided.

2a. Adaxial wings of ray achenes projected into an apical rostrum .............................................. 1. G. carinata
2b. Wings of ray achenes not projected into rostrum ................................................................. 2. G. coronaria

蒿子杆 莪子杆 hao zi gan


Herbs, annual, 20–70 cm tall, glabrous or nearly so; stems erect, usually branched above middle. Basal leaves withered by anthesis; lower and middle stem leaves sessile; leaf blade obovate or narrowly elliptic, 8–10 × 3–4 cm, 2-pinnatifid; primary lateral lobes 3–8-paired; ultimate lobes lanceolate, obliquely triangular or linear. Synflorescence a terminal cyme.

Capitula (1 or)2–8, long pedunculate. Involucres cupular, 1.5–3 cm in diam.; phyllaries in 4 rows, inner ones ca. 1 cm. apex widened, scarious. Ray achenes narrowly 3-winged. Disk achenes 1- or 2-ribbed. Fl. and fr. Sep. 2n = 18*

Widely cultivated as a vegetable. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Hunan, Jilin, Shandong, Zhejiang [native to the Mediterranean region].

Glebionis coronaria is grown both for its bright yellow florets and the edible young shoots. Various authors include Chrysanthemum coronarium var. spatiosum within this species, but it is better placed within the following species, G. segetum.

南茼蒿 nan tong hao


Herbs, annual, 20–60 cm tall, glabrous or nearly so; stems erect, fleshy. Basal and lower stem leaves sessile; leaf blade elliptic, obovate-lanceolate, or ovate-elliptic, margin irregularly largely dentate, rarely pinnatifid. Upper stem leaves gradually smaller. Synflorescence ill-defined, not obviously flat-topped; capitula solitary or few at apices of branches; peduncle ca. 5 cm. Involucres cupular, 1–2 cm in diam.; phyllaries in 4 rows, inner ones scarious, apex enlarged. Ray achenes narrowly 2-winged. Disk achenes with 10 ribs.

Cultivated as a vegetable. Anhui, Beijing, Fujian, Guangdong, Guizhou, Hainan, Hebei, Hunan, Jiangsu, Jiangxi, Yunnan, Zhejiang [native to the Mediterranean region].


滨菊属 bin ju shu

Shi Zhu (石铸 Shih Chu); Christopher J. Humphries, Michael G. Gilbert

Herbs, perennial; indumentum absent or of simple basifixed hairs. Leaves alternate, margin entire, serrate, or pinnatifid. Synflorescences cymost, lax, ± flat-topped, sometimes reduced to single capitulum. Capitula pedunculate, heterogamous, radiate. Involucres coryliform; phyllaries in 3 or 4 rows, scarious margins white or brown. Receptacle convex, sometimes conical, epealeate. Marginal florets in 1 row, female, fertile; lamina white or pink, rarely yellow. Disk florets many, yellow, bisexual; corolla tubular, apex 5-lobed. Anther bases obtuse; apical appendage ovate-lanceolate. Style branches linear, apex truncate. Achenes 10-ribbed, ribs projected or not to apical rim. Corona or adaxial auricle present or not.
Thirty-three species: Europe; one species (introduced) in China.

*Leucanthemum maximum* (Ramond) Candolle (Prodr. 6: 46. 1838; *Chrysanthemum maximum* Ramond, Bull. Sci. Soc. Philom. Paris 2: 140. 1800; 大滨菊 da bin ju), native to SW Europe, is grown in China as an ornamental garden plant. It is closely related to *L. vulgare* but is a larger plant with more acutely toothed leaf margins and wider scarious phyllary margins.

1. **Leucanthemum vulgare** Lamarck, Fl. Franç. 2: 137. 1779.

*Leucanthemum vulgare* Lamarck, Fl. Franç. 2: 137. 1779; *Chrysanthemum leucanthemum* Linnaeus, Sp. Pl. 2: 888. 1753; *Chamaemelum leucanthemum* (Linnaeus) E. H. L. Krause; *Chrysanthemum vulgare* (Lamarck) Gaterau (1789), not (Linnaeus) Bernhardi (1800); *Leucanthemum ircutianum* Candolle; *Matricaria leucanthemum* (Linnaeus) Desrousseaux; *Pyrethrum leucanthemum* (Linnaeus) Franchet (1885), not Wenderoth (1831); *Tanacetum leucanthemum* (Linnaeus) Schultz Bipontinus.

Herbs, perennial, 15–80 cm tall; stems erect, usually unbranched, tomentose, floccose, or glabrous. Basal leaves: petiole longer than blade; leaf blade narrowly elliptic, oblan-

ceolate, obovate, or ovate, 3–8 × 1.5–2.5 cm, base cuneate-

attenuate. Middle and lower stem leaves sessile; leaf blade narrowly elliptic to linear-elliptic, both surfaces glabrous, sometimes pinnatifid below middle or near base, attenuate toward base, base auriculate- or subauriculate-semialate. Distal stem leaves gradually smaller, sometimes pinnatisect. Synflo-

terescence a lax flat-topped cyme; capitula 1–5. Involucre coryli-

form, 1–2 cm in diam.; phyllaries in 3 or 4 rows, abaxially gla-

brous, scarious margin white or brown. Ray florets white; lam-

ina 1–2.5 cm. Achenes 2–3 mm, 10-ribbed, ribs projected into an apical rim. Pappus absent. Fl. and fr. May–Oct. 2n = 18, 36, 36+1B, 54, 72.

Widely cultivated as an ornamental, naturalized in grasslands. Fujian, Gansu, Hebei, Henan, Jiangsu, Jiangxi [native to Europe; introduced and naturalized elsewhere].