

MENISPERMACEAE

防己科 fang ji ke

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Climbing or twining vines, rarely erect shrubs or small trees; indumentum of simple hairs, often absent. Stems striate, without spines; wood often with radial pith rays. Leaves alternate, spiral; stipules absent; petiole swollen at base and apex; leaf blade simple, sometimes palmately lobed, rarely trifoliolate, venation often palmate, less often pinnate. Inflorescences axillary, sometimes from old wood, rarely superaxillary or terminal, often umbelliform cymes, rarely reduced to single flower or flowers in a head on a discoid receptacle, arranged in thyrses, compound umbels, or racemelike; bracts usually small, rarely leafy (female *Cocculus*). Flowers unisexual (plants dioecious), usually small, inconspicuous, mostly pedicellate. Sepals often in whorls of (2 or)3(or 4), rarely reduced to 1 (female *Stephania*), sometimes spirally arranged (*Hypserpa*, *Menispermum*), free or less often connate, imbricate or valvate. Petals usually 3 or 6 in 1 or 2 whorls, rarely 2 or 4, sometimes reduced to 1 or absent, usually free, rarely connate, imbricate or valvate. Stamens (2–)6–8(to many); filaments free or connate, sometimes stamens completely fused into synandrium; anthers 1- or 2-locular or apparently 4-locular, dehiscing longitudinally or transversely. Staminodes sometimes present in female flowers. Carpels 1–6[to many], free, often swollen on one side; style initially terminal; stigma lobed or divided, rarely entire. Ovules 2 reducing to 1 by abortion. Pistillodes very small or absent in male flower. Fruit a drupe, straight or often horseshoe-shaped; exocarp membranous or leathery; mesocarp usually fleshy; endocarp bony or sometimes woody, rarely leathery, surface usually variously ornamented, rarely smooth, sides usually with central smooth and sunken condyle, rarely inconspicuous or lacking (e.g., *Tinomiscium*). Seed usually curved; seed coat thin; endosperm present or absent; embryo mostly curved (straight in *Tinomiscium*); radicle small, opposite to style scar; cotyledons flat and foliaceous or thick and semiterete.

About 65 genera and 350 species: tropical, subtropical, and few temperate regions; 19 genera and 77 species (43 endemic) in China.

Plants of the family contain many different alkaloids and are famous for their medicinal usages. Some species, such as *Pericampylus glaucus* and *Sinomenium acutum*, are used for making rattan articles in Sichuan.

Lo Hsienshui. 1996. Menispermaceae. In: Law Yuwu, ed., Fl. Reipubl. Popularis Sin. 30(1): 1–81.

- 1a. Leaf blade venation pinnate, with main lateral veins inserted distinctly above base, never peltate; petiole scars conspicuously discoid or cuplike.
 - 2a. Inner whorl of male sepals fused into tube, 5–7 mm; stamens 18–27, fused into conical synandrium; female infructescence usually 1-flowered; drupe with style scar close to base; lateral veins 3–5 pairs 3. *Albertisia*
 - 2b. Male sepals all free, imbricate, 1.5–2.8 mm; stamens 4–18, free or with only filaments fused; female inflorescence with several flowers; drupe with style scar distant from base; lateral veins 5–10 pairs.
 - 3a. Stamens (2–)4–11(–18), filaments fused for most of length; drupe 1.1–2 cm, not stipitate 1. *Pycnarrhena*
 - 3b. Stamens 6, filaments free; drupe 2.5–3 cm, with ca. 1.5 cm stipe 2. *Eleutharrhena*
- 1b. Leaf blade venation palmate, with lowermost lateral veins inserted at base of blade or at petiole insertion if peltate, usually more prominent than other lateral veins; petiole scars not conspicuous.
 - 4a. Flowers and fruits in pedunculate umbel-like cymes or discoid heads, these often in compound umbels, sometimes forming a terminal thyrse by reduction of apical leaves, rarely a slender axillary thyrse of heads (*Stephania tetrandra*) 17. *Stephania*
 - 4b. Flowers and fruits in cymes, these flat-topped or in elongated thyrses, sometimes racemelike.
 - 5a. Adaxial leaf surface very finely and closely striate; inflorescence racemose, on leafless stems, usually ferruginous tomentose; male flower with 3 pistillodes; petals 2–2.5(–3.5) mm, deeply emarginate 5. *Tinomiscium*
 - 5b. Adaxial leaf surface not striate; inflorescence cymose, sometimes racemelike but with flowers in small cymes or fascicles; male flower without pistillodes; petals 0.2–2 mm (rarely to 2.5 mm in *Tinospora crispa*).
 - 6a. Plant male.
 - 7a. Stamens fused into ± peltate synandrium with anthers in a marginal ring.
 - 8a. Leaves not peltate.
 - 9a. Inflorescence longer than leaves, up to 30(–50) cm; sepals usually 12 in 4 whorls, outermost minute, inner whorls spatulate to obovate 7. *Aspidocarya*
 - 9b. Inflorescence shorter than leaves, 3–10 cm; sepals 6 in 2 whorls, subequal 9. *Parababena*
 - 8b. Leaves peltate.
 - 10a. Petals connate into cup; sepals free; inflorescence a pedunculate flat-topped cyme 18. *Cissampelos*
 - 10b. Petals connate or free, rarely absent; sepals usually connate, rarely free; inflorescence a slender axillary racemelike or paniclike thyrse 19. *Cyclea*

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- 7b. Stamens free or with filaments fused at base only, anthers free, not fused into ring.
- 11a. Petals absent.
- 12a. Inflorescence 5–8 cm; stamens 9–12, in a sessile cluster; wood not yellow 4. *Arcangelisia*
- 12b. Inflorescence to 30 cm; stamens 3 or 6, free, filaments thick with a prominent collar below anther; wood yellow 6. *Fibraurea*
- 11b. Petals present.
- 13a. Stems herbaceous; stamens 12–18[–36] 16. *Menispermum*
- 13b. Stems woody; stamens 5–10(–12).
- 14a. Sepals 7–12, spiral, not in distinct whorls 10. *Hypserpa*
- 14b. Sepals in 2 or 3 distinct whorls of 3 or 4.
- 15a. Leaf blade never lobed, with main basal veins and their outer branches leading directly to margin.
- 16a. Sepals unmarked, outer whorl much smaller than inner whorl 11. *Pericampylus*
- 16b. Sepals with prominent dark reticulum when dried, outer whorl subequal to inner whorl 12. *Diploclisia*
- 15b. Leaf blade lobed or, if not lobed, with main basal veins dividing or fusing before reaching margin.
- 17a. Petal apex 2-lobed 13. *Cocculus*
- 17b. Petal apex not lobed.
- 18a. Inflorescences not appearing with leaves, glabrous 8. *Tinospora*
- 18b. Inflorescences borne with leaves, pubescent to tomentose.
- 19a. Flowers sessile or subsessile; stamens 6, anthers dehiscing transversely 14. *Pachygone*
- 19b. Flowers clearly pedicellate; stamens 9(or 12), anthers dehiscing longitudinally, nearly apically 15. *Sinomenium*
- 6b. Plant female (based mainly on fruits, female flowers of several taxa not seen).
- 20a. Material with fruits.
- 21a. Seed and seed cavity straight, sometimes broad and concave.
- 22a. Drupe 2.2–5.5 cm with style scar on one side, borne on clavate carpophore to 4 cm; endocarp with fibrous covering and apparently hairy; leaf blade with abaxial domatia in axils of main veins 4. *Arcangelisia*
- 22b. Drupe with terminal style scar; endocarp smooth or sculptured, not fibrous; leaf blade usually without domatia, or only present in basal vein axils.
- 23a. Endocarp clearly spiny 9. *Parabaena*
- 23b. Endocarp ± smooth or rugose to bluntly papillate.
- 24a. Lowermost lateral veins of leaf blade arising several mm above base; endocarp subellipsoid, 2–2.5 cm, condyle forming narrow groove adaxially; inflorescence a lax panicle with branches to 12 cm; wood yellow 6. *Fibraurea*
- 24b. Lowermost lateral veins truly basal; endocarp flattened and without condyle or subglobose with condyle forming adaxial cavity with a central opening; inflorescence a narrow panicle with branches to 3 cm; wood not yellow.
- 25a. Endocarp flattened and without conspicuous condyle 7. *Aspidocarya*
- 25b. Endocarp subglobose with condyle forming adaxial cavity with a central opening 8. *Tinospora*
- 21b. Seed and seed cavity strongly curved, crescent- or horseshoe-shaped to almost ringlike.
- 26a. Carpel 1.
- 27a. Bracts persistent and accrescent to 1.5 cm, often concealing much smaller fruits 18. *Cissampelos*
- 27b. Bracts minute, much smaller than fruits 19. *Cyclea*
- 26b. Carpels 2–6.
- 28a. Inflorescences on old woody stems or superaxillary on leafy shoots 12. *Diploclisia*
- 28b. Inflorescences axillary on leafy stems.
- 29a. Endocarp almost smooth with a small central perforation; seed with large cotyledons, endosperm absent 14. *Pachygone*
- 29b. Endocarp usually clearly sculptured; seed with slender cotyledons, endosperm copious.
- 30a. Leaves peltate; endocarp ca. 10 mm in diam., rather flattened 16. *Menispermum*

- 30b. Leaves never peltate; endocarp 4–8 mm in diam., not obviously flattened.
- 31a. Endocarp laterally concave, condyle lamella-shaped or disciform, not perforate or with small eccentric perforation.
- 32a. Leaf blade never lobed, main basal veins and their outer branches leading directly to margin; endocarp abaxially covered with short pointed processes 11. *Pericampylus*
- 32b. Leaf blade lobed or, if not lobed, main basal veins and their outer branches divided or fused before reaching margin; endocarp with abaxial and lateral ridged crests 15. *Sinomenium*
- 31b. Endocarp with thick hollow condyle, often perforate.
- 33a. Carpels 2 or 3; drupes 6–8 mm 10. *Hypserpa*
- 33b. Carpels 3 or 6; drupes 4–5 mm 13. *Cocculus*
- 20b. Material with female flowers (female flowers are not known for *Arcangelisia* and *Fibraurea* in China).
- 34a. Petals absent.
- 35a. Leaf blade abaxially with hollow domatia in axils of main veins; wood not yellow 4. *Arcangelisia*
- 35b. Leaf blade abaxially without domatia; wood yellow 6. *Fibraurea*
- 34b. Petals present.
- 36a. Petals apically 2-lobed.
- 37a. Sepals with black and striped marks, outer whorl subequal to inner whorl; leaf blade ca. as long as wide 12. *Diploclisia*
- 37b. Sepals without black marks, outer whorl much smaller than inner whorl; leaf blade often conspicuously longer than wide 13. *Cocculus*
- 36b. Petals apically entire.
- 38a. Sepals and petals 1 or 2; carpels 1; leaves often peltate.
- 39a. Bracts leaflike, overlapping along rachis 18. *Cissampelos*
- 39b. Bracts inconspicuous, not overlapping 19. *Cyclea*
- 38b. Sepals and petals each 3 or more; carpels 3; leaves usually not peltate (peltate in *Menispermum* and *Parabaena*).
- 40a. Sepals spiral.
- 41a. Petals 4 or 5; staminodes absent; leaves not peltate 10. *Hypserpa*
- 41b. Petals 6–9; staminodes 6–12; leaves peltate 16. *Menispermum*
- 40b. Sepals whorled.
- 42a. Leaves obviously peltate 14. *Pachygone*
- 42b. Leaves not or only very narrowly peltate.
- 43a. Inner and outer sepals subequal 9. *Parabaena*
- 43b. Inner sepals much larger than outer.
- 44a. Sepals 6 in 2 whorls.
- 45a. Staminodes 9; style curved outward, stigma expanded and lobed 15. *Sinomenium*
- 45b. Staminodes 6; style short, fat and thick, stigma reflexed with short pointed lobes 8. *Tinospora*
- 44b. Sepals 8–12 in 3 or 4 whorls.
- 46a. Inflorescence a cyme; staminodes filamentous 11. *Pericampylus*
- 46b. Inflorescence a panicle, usually very long; staminodes clavate 7. *Aspidocarya*

1. PYCNARRHENA Miers ex J. D. Hooker & Thomson, Fl. Ind. 1: 206. 1855.

密花藤属 mi hua teng shu

Vines. Stems with cuplike petiole scars. Petiole usually short; leaf blade not peltate, pinnately [sometimes palmately] veined. Inflorescences axillary or on old leafless stems, mostly cymose; peduncles sometimes 1-flowered and fascicled. Male flowers: sepals 6–15 in 3 whorls, free, imbricate, outer whorl minute, inner whorl largest, usually rotund and concave; petals (0–)2–5, minute, mostly broadly obovate; stamens (2–)4–11(–18), filaments connate for most of their length, anthers subglobose, dehiscent transversely. Female flowers: sepals and petals as in male; carpels 2–6, ovate, slightly swollen abaxially, stigmas ligulate and recurved.

Drupes ± subglobose, style scar on adaxial side below apex, arising from margin of (subglobose) carpophore; endocarp papery, crustaceous, or subligneous; condyle usually inconspicuous. Seed similar to drupes in shape; endosperm absent; cotyledons large and thick, slightly curved, much longer than radicle.

About nine species: SE Asia and Australia (Queensland); two species in China.

- 1a. Synandrium with 4 or 5 anthers; inner sepals subcircular, deeply concave; leaf blade 1.5–3.5 cm wide, thinly leathery 1. *P. lucida*
 1b. Synandrium with 8–11 anthers; inner sepals elliptic, ± flat; leaf blade 3–6 cm wide, papery 2. *P. poilanei*

1. *Pycnarrhena lucida* (Teijsmann & Binnendijk) Miquel, Ann. Mus. Bot. Lugduno-Batavi 4: 87. 1868.

密花藤 mi hua teng

Cocculus lucidus Teijsmann & Binnendijk, Natuurk. Tijdschr. Ned.-Indië 4: 397. 1853; *Antitaxis calocarpa* Kurz; *A. fasciculata* Miels; *A. nodiflora* (Pierre) Gagnepain; *Pycnarrhena calocarpa* (Kurz) Diels; *P. fasciculata* (Miels) Diels; *Telotia nodiflora* Pierre.

Woody vines. Old stems grayish brown; young stems ferruginous pubescent. Petiole 1–2 cm, swollen at apex, ferruginous puberulent; leaf blade elliptic-lanceolate or elliptic, 7–11 × 1.5–3.5 cm, sometimes larger, thinly leathery, adaxially glossy, base broadly subcuneate or rounded, apex mucronate, acuminate, or subacute; lateral veins 5–7. Inflorescences axillary, fasciculate, cymose, base of peduncle puberulent, usually 1 (or few)-flowered; male peduncle slender, filiform, 3–5 mm. Male flowers: outer whorl of sepals minute, obovate, puberulent, inner larger, ca. 1.5 mm, slightly fleshy, subrotund, saccate; petals usually 2(–5), broadly elliptic, ca. 0.6 × 1 mm, fleshy; synandrium with (2–)4 or 5(–12) anthers. Female flowers not seen. Drupes red, globose or slightly oblique, [0.8–]1.5–2 cm; endocarp fibrously woody; condyle slightly convex. Seeds reniform.

Forests. S and SE Hainan [Cambodia, India (Andaman and Nicobar Islands), Indonesia (W Java, WC Sumatra), Laos, Malaysia, N Thailand].

Diels recognized three species within *Pycnarrhena lucida* as

defined here, based largely on differences in the number of stamens and petals. The view taken here is that this variation is continuous and, therefore, only one species is recognized. If Diels were to be followed, the plant in China would come closest to *P. fasciculata*.

2. *Pycnarrhena poilanei* (Gagnepain) Forman, Kew Bull. 26: 407. 1971.

硬骨藤 ying gu teng

Pridania poilanei Gagnepain in Lecomte, Fl. Gen. Indo-Chine, Suppl. 1: 126. 1938; *P. petelotii* Gagnepain.

Woody vines or scandent shrubs, 2–3 m tall or taller. Branches terete, striate, puberulent or subglabrous. Leaves usually inconspicuously peltate; petiole slender, straight, slightly swollen at apex; leaf blade ovate or elliptic-ovate, sometimes broadly ovate, 9–16 × 3–6 cm, papery, adaxially glabrous, base broadly cuneate, rounded, or sometimes truncate, apex long acuminate, lateral veins 7–10 pairs, conspicuously joined near margin, conspicuously raised abaxially, impressed adaxially. Inflorescences axillary, solitary or fasciculate, cymose, lax, few flowered; peduncles 2–3.5 cm, puberulent. Male flowers: pedicel to 3 mm; sepals 6–9, outer whorl minute, ca. 0.5 mm, inner elliptic or broadly elliptic, 2–2.8 mm; petals 4 or 5, ovate, ca. 1.5 mm, shortly clawed; synandrium 1.5–1.8 mm, with 8–11 anthers. Female flowers: perianth not seen, carpels black, ca. 1 mm. Drupes red when dry, ellipsoid, 1.1–1.3 cm. Fl. summer, fr. autumn.

Dense low-altitude forests. S Hainan, S and SE Yunnan [Thailand, N Vietnam].

2. *ELEUTHARRHENA* Forman, Kew Bull. 30: 99. 1975.

藤枣属 teng zao shu

Vines. Petiole on disciform branchlet cicatrices, apex swollen and geniculate; leaf blade subpeltate, pinnately veined. Male inflorescences axillary or on old leafless stems, fasciculate, few flowered. Male flowers: sepals 12 in 4 whorls, free, imbricate, innermost whorl largest; petals 6; stamens 6, free, columnar, anthers minute, as wide as filament, introrse, dehiscing transversely. Infructescences thickly pedunculate. Female flowers: sepals and petals unknown; carpels 6 on thick gynophore, strong, radially arranged. Drupes with base abruptly narrowed into a stipe, style scar distant from base; endocarp thinly woody; condyle inconspicuous. Seed ellipsoidal; endosperm absent or very thin; cotyledons large and thick.

One species: SW China, NE India.

1. *Eleutharrhena macrocarpa* (Diels) Forman, Kew Bull. 30: 99. 1975.

藤枣 teng zao

Pycnarrhena macrocarpa Diels in Engler, Pflanzenr. 46(IV.94): 52. 1910.

Woody vines. Young stems longitudinally striate, sparsely

puberulent, later glabrous. Petiole slender, 2.5–8 cm; leaf blade ovate to broadly ovate, oblong-ovate, or oblong-elliptic, 9.5–22 × 4.5–13 cm, leathery, glabrous on both surfaces, adaxially glossy, base broadly rotund or obtuse, sometimes broadly cuneate, apex acuminate or subcuspidate, lateral veins 5–9 pairs, prominent on both surfaces, especially abaxially, reticulation sparse and inconspicuous. Male inflorescences fasciculate, 1–3-flowered; peduncles 6–10 mm, puberulent. Male flowers: se-

pals 12, outer 6 ovate, minute, less than 1 mm, puberulent, middle 3 triangular-ovate, 1.5–1.7 mm, slightly puberulent, inner 3 largest, subrotund or broadly ovoid-subrotund, ca. 2.5 mm, glabrous; petals 6, broadly obovate, with lateral margins inflexed and clasping opposite stamen, glabrous; stamens 6, ca. 1.5 mm, free, columnar. Female flowers not seen. Infructescences ramiflorous; peduncles thick, 0.7–2 cm, with 3–6

drupes. Drupes yellow or red, ellipsoidal, 2.5–3 × 1.7–2.5 cm, base with a gynophore up to 1.5 cm. Seeds ellipsoidal, 1.5–1.7 × ca. 1 cm. Fl. May, fr. Oct.

Dense forests; 800–1500 m. S and SE Yunnan [India (Assam)].

An unpublished IUCN list recorded this species as endangered: EN(A1c,2c;B1+2c).

3. ALBERTISIA Beccari, Malesia 1: 161. 1877.

崖藤属 ya teng shu

Epinetrum Hiern.

Woody vines. Stems with prominent discoid petiole scars. Petiole conspicuously swollen at both ends; leaf blade usually elliptic, not peltate, papery or leathery, pinnately veined. Male inflorescences axillary or on old leafless stems, cymose. Male flowers: sepals in 3 whorls, outer and middle whorls minute, free, inner whorl large, connate into a corolloid tube, apex minutely 3-lobed; petals 3 or 6, minute, slightly fleshy; stamens 18–27, connate into a conical synandrium, anthers 2-celled, dehiscing transversely. Female inflorescences mostly reduced to solitary flowers. Female flowers: sepals and petals as in male; carpels 6, elongate-ovoid, attenuated upward into a subulate style. Drupes radiating from margin of a swollen tomentulose carpophore terminating peduncle, usually subellipsoid, style scar near base; mesocarp granular when dry; endocarp crustaceous or subligneous, ± ellipsoid, almost smooth or slightly rugose; condyle slightly prominent or inconspicuous. Seed without endosperm; cotyledons very thick; radicle minute.

About 17 species: 12 species in Africa, five in SE Asia; one species in China.

1. *Albertisia laurifolia* Yamamoto, Rep. Sci. Invest. Hainan Taihoku Univ. 1: 70. 1942.

崖藤 ya teng

Albertisia perryana H. L. Li.

Large woody vines. Young branches tomentulose, glabrescent, gray. Petiole 1.5–3.5 cm, glabrous; leaf blade elliptic or ovate-elliptic, 7–14 × 2.5–5 cm, subleathery, brown when dry, glabrous on both surfaces or only puberulent on midrib and lateral veins abaxially, base obtuse or slightly rotund, apex shortly acuminate or subcuspidate, lateral veins 3–5 pairs, midrib and lateral veins conspicuously prominent abaxially. Male inflorescences cymose, up to 1.5 cm, 3–5 flowered; peduncles and pedicels stout, 3–5 mm, tomentose. Male flowers: sepals in

3 whorls, outer whorl subulate, ca. 0.5 mm, middle whorl linear-lanceolate, ca. 2 mm, inner whorl connate into corolloid tube, 5–7 mm, tomentose abaxially; petals 6 in 2 whorls, outer whorl rhombic, ca. 0.8 mm, lateral margins inflexed, abaxially hispid near midrib, inner whorl subcuneate, glabrous, ca. 0.8 mm; synandrium 3–4 mm, with 27 anthers in 6 vertical rows, filament very short. Female flowers not seen. Drupes ellipsoidal, 2.2–3.3 × 1.5–2 cm, tomentose; endocarp slightly woody, ellipsoidal, 1.5–2.5 cm, surface slightly wrinkled; condyle inconspicuous. Fl. early summer, fr. autumn.

Forests; 200–1000 m. S Guangxi, S Hainan, S Yunnan [N Vietnam].

An unpublished IUCN list recorded this species as vulnerable: VU(A1c,2c;B2c).

4. ARCANGELISIA Beccari, Malesia 1: 145. 1877.

古山龙属 gu shan long shu

Vines. Leaf blade not peltate, leathery, palmately veined. Male inflorescences axillary or on old leafless stems, paniculate. Male flowers: sepals 9 in 3 whorls, free, imbricate, outer whorl usually minute, bracteolelike, inner whorl petaloid; petals absent; stamens 9–12, filaments connate into a short column, anthers dehiscing transversely. Female inflorescences usually cauliflorous, paniculate. Female flowers: perianth 9 in 3 whorls; staminodes scalelike; carpels 3. Drupes subglobose, large, style scar terminal; exocarp leathery; endocarp bony, ± straight, reticulately wrinkled, spiny or smooth, usually with radially spreading hairlike fibers; condyle inconspicuous. Seed with rich endosperm ruminant.

Four species: SE Asia; one species (endemic) in China.

1. *Arcangelisia gusanlung* H. S. Lo, Acta Phytotax. Sin. 18: 100. 1980.

古山龙 gu shan long

Large woody vines up to 10 m. Stems and old branches gray or dark gray, irregularly and longitudinally rugose; branchlets terete, neatly and longitudinally striate, glabrous. Petioles

shorter than leaf blade; leaf blade broadly ovate to broadly ovate-orbicular, 8–13 × 6–9.5 cm, leathery to thickly leathery, fuliginous adaxially and brown abaxially when dry, glabrous on both surfaces, base subtruncate or slightly rounded, rarely subcordate, apex often cuspidate, palmately 5-veined, fine reticulation more conspicuous abaxially. Male inflorescences usually arising from leaf scar on old stems, paniculate, 5–8 cm with

short branches 1–2 cm or slightly longer, subglabrous. Male flowers: sepals 9 in 3 whorls, outer whorls subovate, 0.6–0.8 mm, margin erose, middle whorl oblong-elliptic, 2.2–2.3 mm, inner whorl nautiform, ca. 2.2 mm; synandrium with 9 anthers. Female flowers not seen. Infructescences borne on old stems, stout, carpophores stout, 0.7–1.5 × 0.5–0.7 cm. Drupes yellow when mature, later black, subglobose, slightly flat, 2.5–3 cm, ferruginous pilose; exocarp smooth; endocarp subony, oblate. Fl. summer.

• Forests. Hainan.

Material of this species was originally identified as *Arcangelisia flava* (Linnaeus) Merrill (including *A. loureiroi* (Pierre) Diels) (e.g., Forman, Fl. Thailand 5(3): 339. 1991). *Arcangelisia flava* has larger leaves, (10–)12–25 × (5.5–)8–19 cm, inflorescences 10–50 cm, and carpophores to 4 cm.

This species is used medicinally. An unpublished IUCN list recorded it as vulnerable: VU(A1c,2c;B2c).

5. TINOMISCIUM Miers ex J. D. Hooker & Thomson, Fl. Ind. 1: 205. 1855.

大叶藤属 da ye teng shu

Vines. Petiole long; leaf blade often broad and large, not peltate, subleathery or membranous, adaxially finely and closely striate, palmately 3–5-veined. Inflorescences on old leafless stems, solitary or fasciculate, racemose. Male flowers: sepals 9–12, in 3 or 4 whorls, free, imbricate, outermost 3 minute and bracteolelike, inner 6 large, thinly leathery, margins usually membranous, narrowly oblong; petals 6, slightly shorter than sepals, submembranous, oblong or rotund, margins involute; stamens 6, opposite and subequal to petals, free, filaments thickened, swollen at apex, anthers introrse, dehiscing longitudinally to transversely; pistillodes usually 3. Female flowers: sepals and petals as in male; staminodes 6, lanceolate, apex rostrate; carpels 3, cylindrical-obovate, stigma peltate, many lobed. Drupes 3 or less, subovoid, flattened on both surfaces, abaxially prominent, adaxially smooth, style scar terminal; endocarp woody, straight, ellipsoid to subovoid, tuberculate-rugose; condyle inconspicuous. Seed obovoid; endosperm rich; cotyledons broad, flat, unequal, much longer than radicle.

About seven species: SE Asia; one species in China.

Molecular studies (Rosa et al., Amer. J. Bot. 94: 1425–1438. 2007) suggest that *Tinomiscium* is the sister group to the rest of the Menispermaceae.

1. *Tinomiscium petiolare* Miers ex J. D. Hooker & Thomson, Fl. Ind. 1: 205. 1855.

大叶藤 da ye teng

Tinomiscium tonkinense Gagnepain.

Woody vines. Stems with bark erosely fissured; branchlets and petioles longitudinally striate, exuding white latex when cut; young branches purplish tomentose. Petiole 5–12 cm, puberulent or glabrous; leaf blade broadly ovate, 10–25(–29) × 9–14(–20) cm, thinly leathery, base subtruncate or slightly cordate, margin entire or irregularly serrulate, apex acutely acuminate or sometimes cuspidate, palmately 3–5-veined, with 1–3 pairs of lateral veins, prominent abaxially. Inflorescences arising several together from protuberances on old stems, racemose, often pendulous, 5–12 cm, purplish ferruginous tomentose or puberulent. Male flowers: sepals with outer whorl minute, inner whorl 6(–8), narrowly obovoid-elliptic to elliptic, 3–4.5(–5) mm, glabrous except margins papillose; petals 6, obovoid-elliptic to elliptic, 2–2.5(–3.5) mm, deeply emarginate; stamens 6, 1.4–2.5(–3) mm, connective prolonged, mucronate and incurved. Female flowers: sepals and petals as in male; staminodes linear-oblong, ca. 3 mm; carpels 3, stigma shortly many lobed. Pedicel 1–2 cm. Drupes at first green with white spots, later white to yellow (or orange), with white latex, compressed ellipsoidal, ca. 4 × 1.7–2 × 1.3–1.5 cm, base rounded with short but distinct stalk; endocarp compressed ellipsoidal, 2–3.5 × 1–2 cm, surface obscurely to strongly rugose or rugulose, apex ± acute. Cotyledons extremely unequal, larger one 2-parted, base auriculate.

Forests. S Guangxi, S and SE Yunnan [Indonesia, Malaysia (peninsular), New Guinea, Thailand, C and N Vietnam].

6. FIBRAUREA Loureiro, Fl. Cochinch. 2: 600, 626. 1790.

天仙藤属 tian xian teng shu

Vines. Roots and stems with yellow wood. Petiole long, swollen at both ends; leaf blade ovate or oblong, not peltate, palmately 3–5-veined. Inflorescences often on older leafless stems, lax panicles. Male flowers: sepals 8–12, in 3 or 4 whorls, free, imbricate, outer 2–6 minute, slightly unequal, inner 6 conspicuously larger, subequal, fleshy, margins thin; petals absent; stamens 3 or 6, free, filament thickened, anthers small with pollen cells divaricate, dehiscing longitudinally and obliquely; pistillodes absent. Female flowers: sepals and petals as in male; staminodes 3 or 6, narrowly oblong to elliptic; carpels 3, erect, saccate, ovoid, style extremely short, subterminal. Drupes 1–3, orangish yellow, oblong-obovate to ellipsoidal, style scar subterminal; exocarp smooth; endocarp ± woody, abaxially protuberant, adaxially with a narrow longitudinal groove; condyle forming narrow groove adaxially. Seed subellipsoid; embryo horseshoe-shaped in transverse section, embedded in endosperm; cotyledons broad and extremely thin, foliaceous, much longer than radicle.

Two (to five) species: India (Nicobar Islands) to S China and Philippines; one species in China.

The other much more widespread species, *Fibraurea tinctoria* Loureiro, differs by having 6, not 3, stamens and thicker-walled endocarps. Both species yield a yellow dye.

1. *Fibraurea recisa* Pierre, Fl. Forest. Cochinch. 2: t. 111. 1885.

天仙藤 tian xian teng

Large woody vines up to 10 m or longer; wood bright yellow. Stems brown; branchlets and petioles longitudinally striate. Leaves inconspicuously peltate; petiole (4–)5–14 cm, leaf blade oblong-ovate, sometimes broadly ovate or broadly ovoid-subglobose, 10–25 × 2.5–9(–13) cm, leathery, glabrous, base rounded or obtuse, sometimes subcordate or cuneate, apex subcuspidate or acutely acuminate, palmately 3–5-veined, usually with 3 pairs of distal lateral veins prominent abaxially.

Inflorescences arising from leafless old stems, paniculate; male inflorescences lax, up to 30 cm. Male flowers: pedicels 2–3 mm; perianth variable, outermost whorl minute, ca. 0.3 mm, inner whorl 0.6–1 mm, innermost whorl elliptic, concave, ca. 2.5 × 1.5–1.8 mm; stamens 3, ca. 2 mm, filaments thick and broad, pollen cells subreniform. Female flowers not seen. Drupes yellow, oblong-elliptic, rarely subobovate, 1.8–3 cm; exocarp wrinkled when dry. Fl. spring and summer, fr. autumn.

Forests. SW Guangdong, S Guangxi, SE Yunnan [Cambodia, Laos, Vietnam].

This species is used medicinally.

7. *ASPIDOCARYA* J. D. Hooker & Thomson, Fl. Ind. 1: 180. 1855.

球果藤属 qiu guo teng shu

Vines. Leaf blade cordate, not or only very narrowly peltate, palmately 5–7-veined. Inflorescences axillary, panicles, usually very long. Male flowers: sepals usually 12 in 4 whorls, free, imbricate, outer whorl minute, middle whorl linear-oblong, 1-veined, inner whorl spatulate, 3-veined, innermost whorl obovate, 3-veined; petals 6, obdeltoid or cuneate-obovate, apex 3-gashed or subtruncate, with lateral edges involute, 3-veined; stamens 6, connate into a peltate synandrium, anthers dehiscing transversely. Female flowers: sepals and petals as in male flowers; staminodes 6, clavate; carpels 3, stigma capitate or 3-lobed. Drupes 1–3, subellipsoid, style scar subterminal; exocarp fleshy; endocarp slightly fleshy, with a median abaxial and adaxial ridge and flattened lateral wings; condyle inconspicuous. Seed ovoid-ellipsoidal, flat; endosperm abundant, fleshy.

One species: China, India, Myanmar, Thailand.

1. *Aspidocarya uvifera* J. D. Hooker & Thomson, Fl. Ind. 1: 180. 1855.

球果藤 qiu guo teng

Vines up to 7 m or longer. Stems striate, pubescent to glabrescent. Leaves slightly peltate; petiole 0.8–1.5 cm, striate, swollen and geniculate at base, pubescent to glabrescent; leaf blade ovoid-cordate or broadly ovoid-cordate, entire or rarely 3-lobed, 9–18 × 8–16 cm, papery, pubescent on both surfaces, usually denser adaxially, sometimes only pubescent on veins abaxially, base often deeply cordate, apex caudate-acuminate, palmately 5–7-veined at base, with 2–3 pairs of lateral veins

prominent abaxially. Inflorescences laxly paniculate, up to 30(–50) cm, pubescent. Male flowers: outer sepals 1(–1.5) mm, middle whorl 2(–2.5) mm, inner whorl 2.5(–3.3) mm, puberulent, innermost whorl conspicuously concave, slightly transparent, 3(–3.5) × ca. 2 mm; petals 6, ca. 2 × 1–1.5 mm, light yellow; synandrium (2–)2.5 mm. Female flowers not seen. Inflorescences slightly stout, puberulent; pedicels 1–1.5 cm, apex swollen or capitate. Drupes red when mature, ellipsoidal, ca. 2 cm; endocarp 1.2–1.6 cm. Fl. Apr–May, fr. Sep–Oct.

Dense forests. S and SW Yunnan [E and NE India, Myanmar, N Thailand].

8. *TINOSPORA* Miers, Ann. Mag. Nat. Hist., ser. 2, 7: 35, 38. 1851, nom. cons.

青牛胆属 qing niu dan shu

Campylus Loureiro.

Vines, often with conspicuous aerial roots. Leaf blade not peltate, base cordate, sometimes sagittate or hastate, palmately veined. Inflorescences axillary or on old leafless stems, solitary or fascicled, racemose, cymose, or paniculate. Male flowers: sepals usually 6 in 2 whorls, free, imbricate, outer 3 usually conspicuously smaller, membranous; petals (3 or)6, base clawed, often with lateral edges involute; stamens 6, filaments free [or connate], anthers subextorse, dehiscing longitudinally and obliquely. Female flowers: sepals and petals as in male except petals often smaller; staminodes 6; carpels 3, curved-ellipsoidal, style short, fat and thick, stigma reflexed with short, pointed lobes. Drupes 1–3 borne on a short or columnar carpophore, style scar subterminal; endocarp bony, horseshoe-shaped, abaxially convex and sometimes verrucose or tuberculate, adaxially ± flat; condyle broad, with central aperture leading to a globose cavity. Seed half-moon-shaped; endosperm ruminant; cotyledons foliaceous, ovate, extremely thin, much longer than radicle.

More than 30 species: widely distributed in tropical and subtropical Asia to Australia and the Pacific islands (24 species), Africa (seven species), and Madagascar (two species); six species (three endemic) in China.

Several species are used medicinally for a wide variety of problems. The ability of the deciduous species to grow from detached stems means

that they often benefit from forest clearance. These species are the larval hosts of fruit-piercing noctuid moths that cause significant damage to crops of *Citrus* (particularly Mandarins) and *Dimocarpus longan* (Longan) in Thailand.

- 1a. Vines deciduous, often with long pendulous aerial roots; branchlets fleshy with membranous epidermis and raised lenticels; lenticels eventually cross-shaped.
 - 2a. Branches and leaves densely puberulent 1. *T. sinensis*
 - 2b. Branches and leaves glabrous.
 - 3a. Older stems with very prominent blunt tubercles; inflorescences appearing before new leaves; leaf blade with flat glabrous pockets in abaxial axils of basal veins 2. *T. crispa*
 - 3b. Older stems terete; inflorescences appearing with new leaves; leaf blade with dense tufts of brownish glandular hairs in abaxial axils of basal veins 3. *T. hainanensis*
- 1b. Vines evergreen, without aerial roots; stems and branches not fleshy; lenticels small, lens-shaped, longitudinally 2-dehiscent.
 - 4a. Leaf blade orbicular-cordate, 6.5–11 cm wide, ca. as long as wide or only slightly longer, with rounded basal lobes, basal sinus very narrow 4. *T. guangxiensis*
 - 4b. Leaf blade lanceolate-sagittate to hastate, 2–7.5 cm wide, clearly longer than wide, often with angular basal lobes, basal sinus broad.
 - 5a. Leaf blade margin not toothed (mainland) 5. *T. sagittata*
 - 5b. Leaf blade margin irregularly toothed (Taiwan) 6. *T. dentata*

1. *Tinospora sinensis* (Loureiro) Merrill, Sunyatsenia 1: 193. 1934.

中华青牛胆 zhong hua qing niu dan

Campylus sinensis Loureiro, Fl. Cochinch. 1: 113. 1790; *Cocculus tomentosus* Colebrooke; *Menispermum malabaricum* Lamarck; *M. tomentosum* (Colebrooke) Roxburgh; *Tinospora malabarica* (Lamarck) J. D. Hooker & Thomson; *T. tomentosa* (Colebrooke) J. D. Hooker & Thomson.

Deciduous vines, to 20 m or longer, puberulent when young, often producing very long aerial roots. Old branches fat and thick, bark brownish, membranous, and often glabrous. Stems slightly fleshy, green when young, striate, pubescent; lenticels raised, (2–)4(–6)-dehiscent. Petiole (4–)6–13 cm, puberulent; leaf blade broadly ovate to subrotund, rarely broadly ovate, 7–14 × 5–13 cm, papery, abaxially tomentulose or slightly tomentulose, adaxially puberulent, base deeply to slightly cordate, margin entire, apex acutely acuminate, palmately 5(–7)-veined at base. Inflorescences appearing when plant is leafless. Male inflorescences solitary or few fascicled, 1–4 cm or longer. Male flowers: sepals 6 in 2 whorls, outer 3 oblong or subelliptic, 1–1.5 mm, inner 3 broadly ovate, to 5 mm, ca. 3 mm wide; petals 6, rhomboidal, with claw ca. 1 mm, lobes ca. 2 mm; stamens 6, filaments ca. 4 mm. Female inflorescences solitary. Female flowers: sepals and petals as in male; staminodes 6, to 1 mm; carpels 3. Fruiting peduncle 8–11(–15) mm; carpophores 2–3 mm. Drupes red, subglobose; endocarp semiovoid to hemispherical, 7–9 × ca. 6 mm, broadly keeled at apex with low median ridge abaxially, surface with irregular low tubercles or longitudinal ridges, adaxial aperture elliptic, ca. 1 mm. Fl. Apr, fr. May–Jun.

Forests, cultivation. S Guangdong, S Guangxi, S Yunnan [Cambodia, India, Nepal, Sri Lanka, Thailand, Vietnam].

Preparations of stems and leaves are used for the treatment of rheumatism and other ailments.

2. *Tinospora crispa* (Linnaeus) J. D. Hooker & Thomson, Fl. Ind. 1: 183. 1885.

波叶青牛胆 bo ye qing niu dan

Menispermum crispum Linnaeus, Sp. Pl., ed. 2, 2: 1468. 1763; *Tinospora gibbericaulis* Handel-Mazzetti; *T. mastersii* Diels; *T. rumphii* Boerlage; *T. thorelii* Gagnepain.

Deciduous vines, glabrous, often producing very long aerial roots. Old stems fleshy, with very prominent blunt tubercles. Younger stems slightly fleshy, epidermis thin, membranous, brownish, glabrous; lenticels large and prominently raised. Petiole 5–15(–30) cm, glabrous; leaf blade broadly ovate to orbicular, 6–13 × 6–13 cm, slightly fleshy, very thin papery when dried, both surfaces glabrous, base deeply to shallowly cordate, lobes rounded, margin entire, apex acuminate, palmately 5(–7)-veined, abaxial basal vein axils with shallow glabrous pockets. Inflorescences racemose, unbranched or occasionally shortly branched, appearing before leaves, flowers 2- or 3-fascicled. Male inflorescences very slender, 5–10 cm or longer. Male flowers: sepals 6 in 2 whorls, green, glabrous, outer 3 ovate, ca. 1 mm, inner 3 obovate, 2.5–3 mm; petals 3–6, yellow, obovate-spatulate, 1.6–2.5 mm; stamens 6, as long as petals. Female inflorescences 2–6 cm, flowers mostly 1 per node. Female flowers: sepals and petals as in male; staminodes 6, to 1 mm; carpels 3, ca. 2 mm, stigma lobes very short. Fruiting peduncle 15–20 mm; carpophores 2–3 mm. Drupes orange, subglobose, to 2 cm when fresh; endocarp semiovoid, 11–13 × 7–9 mm, with conspicuous ridge abaxially, surface finely rugulose to almost smooth, adaxial aperture elliptic, small. Fl. spring, fr. summer.

Open forest or shrublands. S Yunnan (Xishuangbanna) [Cambodia, NE India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand].

Tinospora crispa is widely used for a variety of internal complaints. Female plants have rarely been collected, suggesting that it has largely been distributed by the vegetative propagation of male plants for medicinal purposes.

3. *Tinospora hainanensis* H. S. Lo & Z. X. Li, Guihaia 6: 51. 1986.

海南青牛胆 hai nan qing niu dan

Deciduous vines, 3–10 m or longer, glabrous. Old stems

fleshy, 6–10 mm in diam., with epidermis membranous, glabrous; lenticels first lens-shaped, 2-dehiscent, then rounded, 4-dehiscent, conspicuously protruding. Petiole 3–12 cm, base swollen and geniculate; leaf blade cordate or orbicular-cordate, 11–15 × 9–12 cm, membranous papery, light green when dried, both surfaces glabrous except for dense brownish glandular hairs in abaxial basal vein axils, base cordate, with sinus 1–2.5 cm, lobes rotund, margin entire, apex often cuspidate, palmately 5-veined, reticulation raised on both surfaces. Inflorescences coetaneous with leaves. Male inflorescences pseudoracemose, consisting of small cymes on 1–3 mm peduncles. Male flowers unknown. Female flowers in fascicles of 2–4, rarely solitary; bract subulate-lanceolate, 2–3 mm; sepals 6, outer whorl minute, subdeltoid, 1.2–1.5 × ca. 1 mm, inner whorl broadly ovate-elliptic, 3.5–4 × ca. 2.5 mm, ?slightly extended when blooming; petals 6, narrowly lanceolate, ca. 2 × 0.4 mm, margin not reflexed, apex mucronate; staminodes 6, slightly shorter than petals; carpels 3, ca. 2 mm, stigma large. Drupes red, broadly elliptic, 1.1–1.2 × 7–9 mm; endocarp broadly elliptic, 9–10 mm, convex ridge abaxially conspicuous only at each end, surface sparsely tuberculate, adaxially flattened with an elliptic aperture ca. 3 × 1.5 mm to condyle. Fl. Apr, fr. Jun.

- Open forests. Hainan.

Tinospora hainanensis has been misidentified as *T. glabra* (N. L. Burman) Merrill (e.g., Forman, Kew Bull. 36: 417. 1981).

An unpublished IUCN list recorded this species as vulnerable: VU(A1c,2c;B2c).

4. *Tinospora guangxiensis* H. S. Lo, Guihaia 6: 52. 1986.

广西青牛胆 *guang xi qing niu dan*

Vines slightly woody. Stems terete, grayish green, often with purplish green speckles, longitudinally sulcate, glabrous or pubescent. Petiole 3.5–4 cm, base swollen and geniculate; leaf blade orbicular-cordate, 8–14 × 6.5–11 cm, papery, olive green when dried, abaxially densely hirsute-villous, adaxially glabrous or subglabrous, base deeply cordate, basal lobes rounded, slightly divaricate, occasionally folded, apex apiculate, palmately 7-veined, together with lateral veins impressed adaxially and prominent abaxially. Inflorescences and flowers unknown. Inflorescences from axils of previous year's stems, loosely paniculate, up to 24 cm overall; peduncle ca. 15 cm, hirsute. Fruiting pedicels 7–10 mm, stout, apex swollen and globose; drupe milky white, red when dry, obovate; endocarp 6.5–7.5 × 8.5–9 mm, abaxially with midrib protuberant, with tuberculate rugae on both surfaces. Fr. Jun.

- Guangxi (Longzhou).

5. *Tinospora sagittata* (Oliver) Gagnepain, Bull. Soc. Bot. France 55: 45. 1908.

青牛胆 *qing niu dan*

Herbaceous vines. Roots with small and yellow tuberous swelling. Stems slender, striate, often puberulent. Petiole 2.5–6 cm, puberulent or subglabrous, striate; leaf blade lanceolate-sagittate or sometimes lanceolate-hastate, rarely ovate or elliptic-sagittate, 7–15(–22) × 2–7.5 cm, papery to thinly leathery, usually abaxially puberulent on veins, sometimes adaxially or

both surfaces glabrous, base often with deep sinus, basal lobes rounded, obtuse or mucronate, often extending backward, sometimes incurved into 2 folded lobes, rarely extending outside, apex acuminate, sometimes caudate, palmately 5-veined, reticulation prominent or not abaxially. Inflorescences axillary, often a few or many flowers fascicled, cymes, sometimes pseudopanicles, 2–10(–15) cm or sometimes longer; peduncles and pedicels filamentous; bracteoles 2, closely annexed with sepals. Male flowers: sepals 6, sometimes more, often unequal, outermost whorl minute, often ovate or lanceolate, 1–2 mm, inner whorl conspicuously larger, elliptic to broadly elliptic, obovate to broadly obovate, or narrowly lanceolate to narrowly oblong-lanceolate, to 5 mm; petals 6, lobe subrounded or broadly obovate, rarely rhomboidal, often with claw, basal margin often reflexed, 1.4–2 mm. Female flowers: sepals similar to male; petals cuneate, ca. 0.4 mm; staminodes 6, ?oblong, ca. 0.4 mm; carpels 3, subglabrous. Drupes semiglobose, 6–8 mm wide; endocarp 5–8 × 5–8 mm, abaxially rounded or obscurely ridged, smooth or sparsely weakly papillose, adaxial aperture large, broadly elliptic; condyle deeply intrusive. Fl. Apr, fr. autumn.

Forests, grasslands. N Fujian, N and W Guangdong, Guangxi, E and S Guizhou, N Hainan, W Hubei, Hunan, NE Jiangxi, Shaanxi, S Shanxi, Sichuan, SE Xizang, SE Yunnan [N Vietnam].

Forman (Kew Bull. 36: 386. 1981) did not accept the following varieties.

- 1a. Leaf blade inconspicuously reticulate abaxially 5c. var. *yunnanensis*
- 1b. Leaf blade conspicuously reticulate abaxially.
 - 2a. Inner sepals narrowly lanceolate or narrowly oblong-lanceolate 5b. var. *craveniana*
 - 2b. Inner sepals elliptic, broadly elliptic, or elliptic-obovate 5a. var. *sagittata*

5a. *Tinospora sagittata* var. *sagittata*

青牛胆(原变种) *qing niu dan* (yuan bian zhong)

Limacia sagittata Oliver, Hooker's Icon. Pl. 18: t. 1749. 1888; *Tinospora capillipes* Gagnepain; *T. imbricata* S. Y. Hu; *T. sagittata* var. *leucocarpa* Y. Wan & C. Z. Gao; *T. szechuanensis* S. Y. Hu.

Leaf blade conspicuously reticulate abaxially. Inner sepals elliptic, broadly elliptic, or elliptic-obovate.

Forests, grasslands. N Fujian, N and W Guangdong, Guangxi, E and S Guizhou, N Hainan, W Hubei, Hunan, NE Jiangxi, Shaanxi, S Shanxi, Sichuan, SE Xizang, SE Yunnan [N Vietnam].

5b. *Tinospora sagittata* var. *craveniana* (S. Y. Hu) H. S. Lo, Iconogr. Cormophyt. Sin., Suppl. 1: 490. 1982.

峨眉青牛胆 *e mei qing niu dan*

Tinospora craveniana S. Y. Hu, J. Arnold Arbor. 35: 194. 1954; *T. intermedia* S. Y. Hu.

Leaf blade conspicuously reticulate abaxially. Inner sepals narrowly lanceolate or narrowly oblong-lanceolate, 3–5 mm.

- Forests. Sichuan (Emei Shan).

This species is used medicinally.

5c. *Tinospora sagittata* var. *yunnanensis* (S. Y. Hu) H. S. Lo, Iconogr. Cormophyt. Sin., Suppl. 1: 490. 1982.

云南青牛胆 yun nan qing niu dan

Tinospora yunnanensis S. Y. Hu, J. Arnold Arbor. 35: 197. 1954.

Leaf blade inconspicuously reticulate abaxially. Inner sepals obovate or broadly obovate, ca. 2 mm. Fl. spring.

• Guangxi (Napo), SE Yunnan (Jianshui).

6. *Tinospora dentata* Diels in Engler, Pflanzenr. 46(IV.94): 139. 1910.

台湾青牛胆 tai wan qing niu dan

Vines slightly woody. Stems and branches slender, longitudinally striate, young parts puberulent. Petiole 4–5 cm, puberulent; leaf blade subhastate or sagittate, 6–12.5 × 5–7 cm, papery, both surfaces glabrous or abaxially puberulent, very densely so along veins, base cordate, with basal lobes angular-rounded or bearing a few large triangular teeth, margin repand dentate, apex mucronate, palmately 5–7-veined, with 3–5 pairs of lateral veins, reticulation conspicuous adaxially. Male inflorescences axillary or ramiflorous, pseudopaniculate, laxly flowered, solitary or 2- or 3-fascicled, (5–)10–20 cm, sparsely pubescent. Male flowers: pedicels 5–10 mm; sepals 6, ± equal, elliptic to oblanceolate, 6–7 mm; petals 6, cuneate, fleshy, 1.5–2.5 mm; stamens 6, 4–5 mm. Female panicles 8–10 cm. Female flowers and fruits unknown. Drupe not seen. Fl. Mar.

• Taiwan (Hengchun).

9. PARABAENA Miers, Ann. Mag. Nat. Hist., ser. 2, 7: 35, 39. 1851.

连蕊藤属 lian rui teng shu

Vines. Petiole swollen and geniculate at base; leaf blade cordate, not peltate, base hastate or sagittate, palmately veined. Inflorescences axillary, corymbose, often coaxially branching, rachis ± zigzag. Male flowers: sepals 6 in 2 whorls, subequal; petals 6, shorter than sepals, often cuneate-obovate, apex subtruncate or 3-gashed, margin often reflexed; stamens 6, connate into ± peltate synandrium, anthers usually dehiscent transversely. Female flowers: sepals and petals as in male, or different in number and shape; staminodes 6; carpels 3, erect, style short, stigma recurved, large, often lobed or lacinate. Drupes subglobose, style scar subterminal; endocarp bony, obovate, usually spiny; condyle disciform in middle of adaxial side. Seed half-moon-shaped/crescent-shaped; embryo with divaricate ovate cotyledons and long radicle; endosperm rich, fleshy.

About six species: SE Asia to Solomon Islands; one species in China.

1. *Parabaena sagittata* Miers, Ann. Mag. Nat. Hist., ser. 2, 7: 39. 1851.

连蕊藤 lian rui teng

Herbaceous vines. Stems and branches striate, usually puberulent, sometimes subglabrous. Petiole usually equal to or shorter than lamina, rarely longer; leaf blade broadly ovate or oblong-ovate, 8–16(–25) × 5.5–9(–15) cm, papery or membranous when dry, abaxially densely pannose-tomentose, adaxially sparsely puberulent or sometimes subglabrous, base sagittate, lobes mucronate or rounded, margin sparsely serrate to dentate, rarely entire, apex long acuminate, palmately 5–7-veined, veins slightly prominent abaxially. Inflorescences solitary or sometimes paired, corymbose, tomentose. Male flowers: sepals

ovate-rounded, rotund, or elliptic-ovate, 1.7–2 mm, puberulent abaxially; petals obovate-cuneate, ca. 1.3 mm; synandrium ca. 1 mm. Female flowers: sepals 4 in 2 whorls, outer whorl cuneate-oblong, 2.2–2.5 × 1.3–1.5 mm, apex subtruncate or slightly rounded, inner whorl subovate, base concave or saccate; petals 4, opposite to sepals, oblong, ca. 1.7 mm; staminodes linear, flat, ca. 1 mm; carpels 3, saccate-ovate, ca. 1.3 mm, stigma recurved. Drupes subglobose and slightly flattened, ca. 8 mm or longer; endocarp ovate-semiglobose, with prominent crest abaxially and 2 rows of spines on each surface. Fl. Apr–May, fr. Aug–Sep.

Forest margins, shrublands. NW and S Guangxi (Longlin), S Guizhou (Anlong), S Xizang, SE and W Yunnan [Bangladesh, Bhutan, NE India, Laos, Myanmar, Nepal, Thailand, Vietnam].

10. HYPSEPERA Miers, Ann. Mag. Nat. Hist., ser. 2, 7: 36, 40. 1851.

夜花藤属 ye hua teng shu

Woody vines. Stems with young growing tips sometimes tendril-like. Leaf blade entire, not peltate, palmately 3(–7)-veined. Inflorescences axillary, cymose paniculate, usually minute. Male flowers: sepals 7–12, spirally arranged, imbricate, outer sepals minute and bracteolelike, inner larger; petals 4 or 5, fleshy, usually obovate or spatulate, sometimes absent; stamens 5–10 [to many], free or shortly connate at base, anthers dehiscent longitudinally. Female flowers: sepals and petals similar to male; staminodes present or absent; carpels (?1–)2 or 3(–6?), style short, stigma entire or 3-lobed, reflexed. Drupes subcompressed obovoid to subglobose, style scar near base; endocarp bony, curved, abaxially rugulose and bearing transverse ridges radially arranged outside; condyle with 2 lateral cavities each with an external aperture or no aperture. Seed embryo terete, almost curved into a circle, embedded in endosperm; cotyledons subequal to or shorter than radicle.

About six species: S and SE Asia to Pacific islands and Australia; one species in China.

1. *Hypserpa nitida* Miers, Hooker's J. Bot. Kew Gard. Misc. 3: 258. 1851.

夜花藤 ye hua teng

Hypserpa cuspidata (J. D. Hooker & Thomson) Miers; *H. laevifolia* Diels; *Limacia cuspidata* J. D. Hooker & Thomson.

Woody vines. Branchlets sparsely to densely pubescent with yellowish hairs when young, glabrescent. Petiole 1–2 cm, pubescent or subglabrescent; leaf blade ovate, ovate-elliptic to oblong-elliptic, rarely elliptic or broadly elliptic, 4–10(–12) × 1.5–5(–7) cm, papery to leathery, both surfaces usually glabrous, rarely pubescent along nerves, adaxially glossy, base rounded to broadly cuneate, apex acuminate, mucronate, or slightly obtuse with a finely mucronate acumen, palmately 3-veined. Male inflorescences usually only few flowered, cymose

to paniculate, 1–2 cm, rarely longer and more flowered, pubescent. Male flowers: sepals 7–11, outer sepals minute and bracteolelike, 0.5–0.8 mm, puberulent outside, innermost 4 or 5 broadly obovate or ovate to ovate-rotund, 1.5–2.5 mm, ciliate; petals 4 or 5, subobovate, 1–1.2 mm; stamens 5–10, free above or connate only at base, 1–1.5 mm. Female flowers: sepals and petals as in male; carpels 2; ovary semiglobose or subelliptic, 0.8–1 mm, glabrous. Drupes subglobose, slightly compressed, yellow or orangish red when mature; endocarp obovate, 5–6 mm. Fl. and fr. summer.

Forests, forest margins. S Fujian, C and S Guangdong, Guangxi, Hainan, S Yunnan [Bangladesh, India (Assam), Indonesia, Laos, Malaysia, Myanmar, Philippines, Sri Lanka, Thailand].

The roots contain the alkaloids limacine and fanchinoline, which are used medicinally.

11. PERICAMPYLUS Miers, Ann. Mag. Nat. Hist., ser. 2, 7: 36, 40. 1851, nom. cons.

细圆藤属 xi yuan teng shu

Pselium Loureiro.

Woody vines. Leaf blade not or only narrowly peltate, palmately veined. Inflorescences axillary, solitary or 2- or 3-fascicled cymes. Flowers: sepals 9 in 3 whorls, imbricate, outermost 3 minute and bracteolelike, inner 6 larger and concave; petals 6, cuneate or rhombic-obovate, with lateral margins involute and clasping opposite stamen; stamens 6, free or ± connate, anthers dehiscent longitudinally. Female flowers: sepals and petals as in male; staminodes 6, filamentous; carpels 3, style short, stigma 2-parted, lobes 2, lobes and lobules divaricate. Drupes compressed globose, style scar near base; endocarp bony, broadly ovoid to rotund, curved, abaxially covered with conical or short pointed processes on both surfaces; condyle septiform, not perforate. Seed horseshoe-shaped; embryo elongate or narrow, embedded in endosperm; cotyledons terete, much shorter than radicle.

About two or three species: tropical and subtropical Asia; one species in China.

1. *Pericampylus glaucus* (Lamarck) Merrill, Interpr. Herb. Amboin. 219. 1917.

细圆藤 xi yuan teng

Menispermum glaucum Lamarck, Encycl. 4: 100. 1797; *Cocculus incanus* Colebrooke; *Coscinium colaniae* Gagnepain; *Pericampylus formosanus* Diels; *P. incanus* (Colebrooke) J. D. Hooker & Thomson; *P. omeiensis* W. Y. Lien; *P. trinervatus* Yamamoto.

Woody vines to 10 m or longer. Old stems glabrescent; young stems often long and pendulous, usually yellowish tomentose, striate. Petiole 3–7 cm, tomentose; leaf blade triangular-ovate to triangular-oblong, length and width 3.5–8(–10) cm, papery to thinly leathery, both surfaces tomentose or adaxially sparsely pubescent to glabrescent, rarely both surfaces

glabrous, base subtruncate to cordate, rarely broadly cuneate, margin crenate or subentire, apex obtuse or rounded, rarely mucronate, apiculate, palmately (3–)5-veined, reticulation conspicuous. Inflorescences corymbose cymes, 2–10 cm, tomentose. Male flowers: sepals 9, ± pubescent abaxially, outer 3 narrow, ca. 0.5 mm, middle 3 oblanceolate, 1–1.5 mm, inner 3 slightly broad; petals 6, cuneate or sometimes spatulate, 0.5–0.7 mm, margin involute; stamens 6, filaments free or ± adnate, ca. 0.75 mm. Female flowers: sepals and petals as in male flowers; staminodes 6; ovary 0.5–0.7 mm, stigma 2-lobed. Drupes red or purple; endocarp 5–6 mm in diam. Fl. Apr–Jun, fr. Sep–Oct.

Forests, forest margins, shrublands; ca. 700 m (up to nearly 1300 m in Thailand). Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Taiwan, Zhejiang [India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam].

12. DIPLOCLISIA Miers, Ann. Mag. Nat. Hist., ser. 2, 7: 37, 42. 1851.

秤钩风属 cheng gou feng shu

Woody vines; branches often pendulous. Leaf blade not peltate to conspicuously peltate, leathery, palmately veined. Inflorescences superaxillary umbel-like cymes on leafy shoots or panicles on old leafless stems. Male flowers: sepals 6 in 2 whorls, with black stripes when dry, outer sepals usually narrower than inner; petals 6, with sides folded inward around opposite filament; stamens 6, free, filaments swollen in upper half, anthers subglobose, dehiscent transversely. Female flowers: sepals and petals as in male flowers, petals usually 2-lobed at apex; staminodes 6, anthers very small; carpels 3, styles short, stigmas recurved, flattened with margins dentate. Drupes obovate or narrowly obovate and curved, style scar near base; endocarp bony, narrow at base, curved, abaxially ornamented with many transverse ridges on both surfaces; condyle septiform. Seed horseshoe-shaped; embryo narrow; radicle much shorter than foliaceous cotyledons; endosperm scanty.

Two species: tropical Asia; two species (one endemic) in China.

- 1a. Inflorescences superaxillary on leafy shoots, umbel-like cymes; drupe obovate, ca. 1 cm; axillary buds 2, upper bud or inflorescence inserted above lower 1. *D. affinis*
 1b. Inflorescences on old leafless stems, elongated, thyrsoïd; drupe narrowly obovate, 1.3–2 cm; axillary bud 1, inserted normally in axil 2. *D. glaucescens*

1. *Diploclisia affinis* (Oliver) Diels in Engler, Pflanzenr. 46 (IV.94): 227. 1910.

秤钩风 cheng gou feng

Cocculus affinis Oliver, Hooker's Icon. Pl. t. 1760. 1888; *Diploclisia chinensis* Merrill.

Woody vines to 8 m. Old branches reddish brown or dark brown, lenticels many, longitudinally dehiscent, glabrous; current year's branches yellowish, striate, axillary buds 2, upper bud inserted above lower. Petiole almost equal to or longer than lamina; leaf blade not or only slightly peltate, triangular-oblanceolate or rhombic-oblanceolate, sometimes rhomboidal or broadly ovate, 3.5–9 cm or longer, slightly wider than long, leathery, base subtruncate to shallowly cordate, sometimes rotund or sharply mucronate, margin conspicuously or inconspicuously undulate, apex mucronate or obtuse and apiculate, palmately 5-veined, with reticulation prominent on both surfaces. Inflorescences superaxillary on leafy shoots, in series with one above other, umbel-like cymes, 3- to many flowered; peduncles straight, 2–2.5 cm. Male flowers: sepals elliptic to broadly ovate, 2.5–3 mm, outer whorl ca. 1.5 mm wide, inner whorl 2–2.5 mm wide; petals ovate-rhombic, with sides folded inward at base around filaments; stamens 2–2.5 mm. Female flowers unknown. Drupes red, obovate, 8–10 × ca. 7 mm. Fl. Apr–May, fr. Jul–Sep.

• Forest margins, sparse forests; ca. 400 m. Anhui, Fujian (Yong'an), E and N Guangdong, N Guangxi, N Guizhou, W Hubei, NW Hunan, Jiangxi, E and SE Sichuan, Yunnan, E and S Zhejiang.

The supra-axillary inflorescences are unique at least among the Chinese members of the Menispermaceae.

2. *Diploclisia glaucescens* (Blume) Diels in Engler, Pflanzenr. 46(IV.94): 225. 1910.

苍白秤钩风 cang bai cheng gou feng

Cocculus glaucescens Blume, Bijdr. 25. 1825; *C. kunstleri* King; *C. macrocarpus* Wight & Arnott; *Diploclisia kunstleri* (King) Diels; *D. macrocarpa* (Wight & Arnott) Miers.

Large woody vines, to 20 m or longer. Stems up to 10 cm in diam.; branches and leaves rather similar to *Diploclisia affinis*, except axillary bud only 1. Petiole usually much longer than lamina; leaf blade not peltate to conspicuously peltate, glaucescent abaxially, leathery. Inflorescences cauliflorous, on old leafless stems, panicles, usually several to many fascicled, ± pendulous, 10–30 cm or longer; flowers light yellow, slightly fragrant. Male flowers: sepals 2–2.5 mm, marked by a dark reticulum, outer whorl elliptic, inner whorl broadly elliptic or broadly elliptic-obovate; petals obovate or rhombic, 1–1.5 mm, apex mucronate or emarginate; stamens ca. 2 mm. Female flowers: sepals and petals as in male flowers except petals 2-lobed at apex; staminodes filamentous; carpels 1.5–2 mm. Drupes yellowish red, narrowly oblong-obovate, 1.3–2(–3) cm, base curved. Fl. Apr, fr. Aug.

Forests. E and S Guangdong, NW Guangxi, Hainan, S and SE Yunnan [India, Indonesia, Myanmar, New Guinea, Philippines, Sri Lanka, Thailand].

This species is used medicinally.

13. COCCULUS Candolle, Syst. Nat. 1: 515. 1817, nom. cons.

木防己属 mu fang ji shu

Nephroia Loureiro.

Woody vines, erect shrubs, or small trees. Leaf blade entire or lobed, not peltate, palmately veined. Inflorescences axillary or terminal, cymose or thyrsoïd. Male flowers: sepals 6(or 9) in 2(or 3) whorls, imbricate, outer sepals smaller, inner sepals larger and concave; petals 6, apex 2-lobed, lobes divaricate, with basal reflexed auricles; stamens 6 or 9, free, anthers dehiscent with a transverse slit. Female flowers: sepals and petals as in male flowers; staminodes 6 or absent; carpels 3 or 6, style columnar, stigma reflexed. Drupes obovate or rotund, slightly flat, style scar near base; endocarp bony, horseshoe-shaped, abaxially verruculose or ridged; condyle with 2 distinct lateral chambers, each with a large lateral aperture. Seed horseshoe-shaped; embryo with radicle short; endosperm scanty; cotyledons linear and flattened.

About eight species: Africa, E, SE, and S Asia, Pacific islands, Central and North America; two species in China.

Female material of this genus is difficult to distinguish from that of the genus *Pachygone*.

- 1a. Twining vines; petiole 1–3(–5) cm, whitish tomentose or pubescent; basal lateral veins of leaves comparable to distal lateral veins, usually obscure beyond middle of leaf blade; carpels 6; petals involute at base 1. *C. orbiculatus*
 1b. Erect shrubs or small trees; petiole to 1 cm, glabrous; basal lateral veins of leaves much more prominent than distal lateral veins, well defined beyond middle of leaf blade; carpels 3; petals flat 2. *C. laurifolius*

1. *Cocculus orbiculatus* (Linnaeus) Candolle, Syst. Nat. 1: 523. 1817.

木防己 mu fang ji

Woody vines. Young branches striate, puberulent to subglabrous. Petiole 1–3(–5) cm, whitish tomentose or pubescent; leaf blade variable in shape, linear-lanceolate to broadly ovate, narrowly elliptic to rotund, oblanceolate to orbiculate, some-

times 3(–5)-lobed, 3–8(–10) cm, variable in width, papery to thinly leathery, both surfaces puberulent to glabrous, base rounded to truncate, occasionally broadly cuneate or shallowly cordate, margin entire, apex acute or obtuse, with a finely mucronate acumen, sometimes slightly emarginate or 2-lobed, palmately 3(or 5)-veined, basal pair of veins usually obscure beyond middle of leaf blade, slightly raised abaxially. Inflorescences axillary, cymose, few flowered, or many flowered arranged in a narrow terminal or axillary thyrse, up to 10 cm or longer, puberulent. Male flowers: bracteoles 1 or 2, ca. 0.5 mm, closely adnate to sepals, puberulent; sepals 6, outer whorl ovate or elliptic-ovate, 1–1.8 mm, inner whorl broadly elliptic to rotund, sometimes broadly obovate, up to 2.5 mm or slightly longer; petals 6, 1–2 mm, with sides shortly above base folded inward around opposite filament, apex divided into 2 acuminate or acute lobes; stamens 6, shorter than petals. Female flowers: sepals and petals as in male flower; staminodes 6, minute; carpels 6, glabrous. Drupes rotund, red to reddish purple, usually 7–8 mm in diam.; endocarp bony, 5–6 mm in diam., abaxially ornamented with branched ridges.

Sparse forests, shrublands, village margins, forest margins; near sea level to 1200 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [E India, Indonesia, Japan, Laos, Malaysia, Nepal, Philippines; introduced in Indian Ocean islands (Mauritius, Réunion) and Pacific islands (Hawaii)].

1a. Sepals glabrous 1a. var. *orbiculatus*
1b. Sepals puberulent abaxially 1b. var. *mollis*

1a. *Cocculus orbiculatus* var. *orbiculatus*

木防己(原变种) mu fang ji (yuan bian zhong)

Menispermum orbiculatum Linnaeus, Sp. Pl. 1: 341. 1753; *Cocculus cuneatus* Benthams; *C. sarmentosus* (Loureiro) Diels; *C. sarmentosus* var. *linearis* Yamamoto; *C. sarmentosus* var. *pauciflorus* Y. C. Wu; *C. sarmentosus* var. *stenophyllus* Merril; *C. thunbergii* Candolle; *C. trilobus* (Thunberg) Candolle; *M. trilobum* Thunberg; *Nephroia cuneifolia* Miers; *N. dilatata* Miers; *N. pubinervis* Miers ex Benthams; *N. pycnantha* Miers; *N. sarmentosa* Loureiro.

Sepals glabrous.

Shrublands, village margins, forest margins. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Indonesia,

Japan, Malaysia, Philippines; introduced in Indian Ocean islands (Mauritius, Réunion) and Pacific islands (Hawaii)].

1b. *Cocculus orbiculatus* var. *mollis* (Wallich ex J. D. Hooker & Thomson) H. Hara, Bull. Univ. Mus. Univ. Tokyo 2 [Fl. E. Himalaya 2nd Rep.]: 35. 1971.

毛木防己 mao mu fang ji

Cocculus mollis Wallich ex J. D. Hooker & Thomson, Fl. Ind. 1: 193. 1855; *C. lenissimus* Gagnepain; *C. mokiangensis* W. Y. Lien.

Sepals puberulent abaxially.

Sparse forests, shrublands. NW Guangxi, SW Guizhou, Sichuan, S Yunnan [E India, Nepal].

2. *Cocculus laurifolius* Candolle, Syst. Nat. 1: 530. 1817.

樟叶木防己 zhang ye mu fang ji

Cinnamomum esquirolii H. Léveillé.

Erect shrubs or small trees, rarely climbing, usually 1–5(–8) m. Branches striate; branchlets slightly angular, glabrous. Petiole usually less than 1 cm, glabrous; leaf blade elliptic, ovate, or long elliptic to lanceolate-elliptic, rarely oblanceolate, 4–15 × 1.5–5 cm, thinly leathery, both surfaces glabrous and glossy, base cuneate or acute, apex acute and attenuate, palmately 3-veined, basal pair of veins well-defined beyond middle of leaf blade, reticulate veins fine, raised on both surfaces. Inflorescences axillary, cymose or thyrse, 1–5 cm, glabrous. Male flowers: sepals 6, outer whorl subelliptic, 0.8–1 mm, inner whorl ovate-elliptic to broadly elliptic-rotund, ca. 1.3 mm; petals 6, obcordate, 0.2–0.4 mm, base not reflexed inward, apex 2-lobed; stamens 6, ca. 1 mm. Female flowers: sepals and petals as in male flower; staminodes 6, minute; carpels 3, glabrous. Drupes black, rotund, slightly flattened, 6–7 mm; endocarp bony, abaxially ornamented with branched ridges. Fl. spring to summer, fr. autumn.

Shrublands, open forests. S Guizhou, NW Hunan, Taiwan, Xizang (Gyirong) [India, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Thailand].

Cocculus laurifolius is frost resistant and grown as a slow-growing ornamental tree in the S United States.

An alkaloid in the bark has a muscle-relaxing effect, similar to that of curare. The plant has also been used as a diuretic and as a vermifuge.

14. **PACHYGONE** Miers, Ann. Mag. Nat. Hist., ser. 2, 7: 37, 43. 1851.

粉绿藤属 fen lü teng shu

Woody vines. Leaf blade usually ovate, peltate, palmately 3–5-veined. Inflorescences axillary, botryoid, racemose or narrowly paniculate. Male flowers: sepals 6–12, imbricate, outer whorl minute and bracteolelike, inner whorl large; petals 6, small, with basal inflexed auricles clasping opposite stamen; stamens 6, free, anthers corpulent, dehiscing with a transverse slit. Female flowers: sepals and petals as in male flowers; staminodes 6, shorter than petal; carpels 3, with one side swollen, ovate, glabrous, style curved outward. Drupes obovate or rotund, slightly compressed, style scar near base; endocarp bony, reniform-rounded, slightly concave on each side; condyle small, subspatulate. Seed curved; endosperm absent or scanty; cotyledons large, thick, much longer than radicle.

Ten to twelve species: S and SE Asia and Oceania; three species (all endemic) in China.

- 1a. Leaf blade puberulent on both surfaces, rather dense abaxially; endocarp irregularly ornamented with branching ridges 3. *P. yunnanensis*
- 1b. Leaf blade glabrous on both surfaces; endocarp rugose or reticulately ornamented.
- 2a. Staminodes 6 in female flower; stamens shorter than petals in male flower; leaves usually ovate, 5–9 × 2–5 cm; endocarp rugose 1. *P. sinica*
- 2b. Staminodes absent in female flower; stamens longer than petals in male flower; leaves usually broadly ovate, 6–18 × 3–12 cm; endocarp reticulately ornamented 2. *P. valida*

1. *Pachygone sinica* Diels, Notizbl. Bot. Gart. Mus. Berlin-Dahlem 11: 209. 1931.

粉绿藤 *fen lü teng*

Woody vines up to 7 m or longer. Branches and branchlets rugosely striate, branchlets slender, pubescent. Petiole slender and erect, 1.5–4 cm, glabrous, apex slightly swollen and twining; leaf blade ovate, rarely broadly ovate or lanceolate, 5–9 × 2–5 cm, thinly leathery, both surfaces glabrous, base rounded or sometimes subtruncate, apex acuminate, palmately 3–5-veined, basal pair of veins often slender or inconspicuous, reticulate veins fine, raised on both surfaces. Inflorescences racemose or narrowly paniculate, 1–10 cm; rachis slender and pubescent; bracteoles 2, closely adnate to sepals. Male flowers: sepals in 2 whorls of 3, outer whorl oblong-lanceolate, ca. 1.1 mm, sparsely puberulent outside, inner whorl broadly elliptic or broadly ovate-elliptic, 1.5–1.7 mm, puberulent on midrib outside; petals 6, fleshy, lanceolate, 1.6–1.7 mm, with basal inflexed auricles clasping opposite stamen; stamens 6, 1.3–1.6 mm, anthers large and dehiscent with transverse slit. Female flowers: sepals and petals as in male flower but usually smaller; staminodes 6; carpels 3(or 4). Drupes obovate; endocarp elliptic-reniform, crustaceous, 1.3–1.4 × ca. 1 cm, rugose on surface. Fl. Sep–Oct, fr. Feb.

- Forests. C, N, and W Guangdong, E and N Guangxi.

An unpublished IUCN list recorded this species as vulnerable: VU(A1c,2c;B2c).

2. *Pachygone valida* Diels in Engler, Pflanzenr. 46(IV.94): 243. 1910.

肾子藤 *shen zi teng*

Limaciopsis valida (Diels) H. S. Lo.

Woody vines. Branches light brownish yellow, striate; branchlets often slightly twining, puberulent. Petiole deeply grooved, 3–7 cm, glabrous, apex slightly swollen; leaf blade

ovate to broadly ovate, sometimes broadly ovate-rotund, 6–18 × 3–12 cm, leathery, both surfaces glabrous, base subtruncate or slightly cordate, rarely cuneate or slightly rounded, apex often cuspidate, palmately 5(–7)-veined, reticulate veins thin, dense, raised on both surfaces, conspicuous abaxially. Inflorescences axillary or borne on old and leafless branches, solitary or paired, narrowly paniculate thyrses, branching shorter than 1 cm. Male flowers: bracteoles 2, lanceolate-ovate, ca. 0.6 mm, closely adnate to sepals; sepals in 2 whorls of 3, subrotund, broadly ovate to rhombic-rotund, deeply emarginate, ca. 1.5 mm, margin thin; petals 6, cuneate, ca. 0.6 mm, with apical auricles clasping opposite stamen; stamens 6, slightly longer than petals, pollen cells large, divaricate, dehiscing with a transverse slit. Female flowers: sepals and petals as in male flower but petals with margin inflexed on both sides; staminodes absent; carpels 3, ovate-semispheroidal, style curved outward. Drupes obovate, 1.7–1.8 cm; endocarp subhelicoid-reniform, crustaceous, ca. 1.5 × 1.2 cm, reticulately ornamented on surface; condyle conspicuously curved. Seeds rotund; endosperm almost absent. Fl. Apr, fr. Dec–Jan.

- Dense forests. NW and S Guangxi, S Guizhou, S Yunnan (Mengzi).

3. *Pachygone yunnanensis* H. S. Lo, Guihaia 10: 181. 1990.

滇粉绿藤 *dian fen lü teng*

Woody vines. Branchlets olive green, striate, subglabrous. Petiole 1–3 cm, puberulent; leaf blade cordate to ovate-cordate, 5–10 × ca. 6.5 cm, thinly leathery, grayish green when dry, densely puberulent abaxially, adaxially sparsely puberulent, base cordate, apex cuspidate, palmately 3–5-veined, lateral veins 1 or 2 pairs. Inflorescences axillary, cymose, 5–7-flowered; peduncle ca. 6 mm. Flowers not seen. Fruiting peduncle ca. 1.5 cm. Drupes reniform-globose, 7–8 × 9–10 mm; endocarp irregularly ornamented with branching ridges.

- W Yunnan (Tengchong).

15. *SINOMENIUM* Diels in Engler, Pflanzenr. 46(IV.94): 254. 1910 [*“Sinomenia”*].

风龙属 *feng long shu*

Woody vines. Leaf blade not peltate, palmately veined. Inflorescences axillary, paniculate. Male flowers: sepals 6 in 2 whorls, imbricate in bud, extending outward when blooming, outer whorl narrower; petals 6, with basal margins inflexed and clasping opposite stamen; stamens 9, rarely 12, free, anther large, squared globose, dehiscing nearly apically. Female flowers: sepals and petals as in male flowers; staminodes 9; carpels 3, saccate-semiovate, style curved outward, stigma expanded and lobed. Drupes obovate, slightly oblique, style scar near base; endocarp rather flattened, with both sides concave and smooth, abaxially with 2 rows of spines projecting along midrib, ornamented with branching ridges in a row on both surfaces; condyle lamella-shaped. Seed half-moon-shaped; endosperm rich; cotyledons shorter than radicle.

- One species: China, N India, Japan, Nepal, N Thailand.

1. *Sinomenium acutum* (Thunberg) Rehder & E. H. Wilson in Sargent, Pl. Wilson. 1: 387. 1913.

风龙 feng long

Menispermum acutum Thunberg in Murray, Syst. Veg., ed. 14, 892. 1784; *Cocculus diversifolius* Miquel (1867), not Candolle (1817); *C. diversifolius* var. *cinereus* Diels; *C. heterophyllus* Hemsley & E. H. Wilson; *M. diversifolium* Gagnepain; *M. diversifolium* var. *molle* Gagnepain; *Sinomenium acutum* var. *cinereum* Diels ex Rehder & E. H. Wilson; *S. diversifolium* Diels.

Woody vines, to more than 20 m. Old stems gray, bark irregularly and longitudinally striate. Branches terete, regularly striate, puberulent to glabrous. Petiole 5–15 cm, striate, glabrous or puberulent; leaf blade cordate-ovate to broadly ovate, sometimes (3–)5–9-lobed, 6–15 cm or longer, leathery to papery, tomentose when young, or only glabrous adaxially and puberulent abaxially, usually glabrous when old, base often

deeply cordate with narrow sinus, sometimes subtruncate or rounded, margin entire, lobes pointed or obtuse, apex acuminate or mucronate, palmately [3–]5(–7)-veined, reticulation conspicuously prominent abaxially. Inflorescences axillary, lax conical panicles, to 30 cm, usually shorter than 20 cm; rachis puberulent or tomentose; bracts linear-lanceolate. Male flowers: bracteoles 2, closely adnate to sepals; sepals yellowish green, abaxially puberulent, outer whorl oblong, 2–2.5 mm, inner whorl subovate, subequal to outer whorl; petals slightly fleshy, 0.7–1 mm; stamen 1.6–2 mm. Female flowers: sepals and petals as in male flower; staminodes filamentous; carpels glabrous. Drupes red to dark purple or blue-black, 5–6 mm in diam. or slightly larger. Fl. summer, fr. autumn.

Forests. Anhui, N Guangdong, N Guangxi, Guizhou, Henan, Hubei, Jiangxi, S Shanxi, Sichuan, SE Yunnan, Zhejiang [N India, Japan, Nepal, N Thailand].

Sinomenium acutum contains the alkaloid sinomenine, which is used to treat arthritis and other inflammatory conditions.

16. MENISPERMUM Linnaeus, Sp. Pl. 1: 340. 1753.

蝙蝠葛属 bian fu ge shu

Herbaceous vines. Leaf blade peltate, palmately veined. Inflorescences axillary. Male flowers: sepals 4–10, ± spirally arranged, usually concave; petals 6–8 or more, ± fleshy, reniform-cordate to rotund, margin inflexed; stamens 12–18[–36], free, anther subglobose, dehiscent longitudinally. Female flowers: sepals and petals as in male flower; staminodes 6–12 or more, clavate; carpels 2–4, ovary saccate-semiovoid, style short, stigma large and lobed, curved outward. Drupes suboblate, style scar near base; endocarp reniform-rounded or broadly half-moon-shaped, rather flattened; condyle lamella-shaped. Seed embryo annularly curved; endosperm rich; cotyledons semiterete, slightly longer than radicle.

Three or four species: E Asia, North America; one species in China.

1. *Menispermum dauricum* Candolle, Syst. Nat. 1: 540. 1817.

蝙蝠葛 bian fu ge

Menispermum chinense Kundu & S. Guha; *M. dauricum* var. *pauciflorum* Franchet; *M. dauricum* var. *pilosum* C. K. Schneider; *M. miersii* Kundu & S. Guha.

Herbaceous deciduous vines. Neck of rootstock brown, vertical, new stems from subapical buds, slender, striate, usually glabrous. Petiole 3–10[–13.5] cm or slightly longer, striate; leaf blade usually cordate-oblate in outline, usually shallowly 3–9-lobed, 3–12 × 3–12 cm, papery or submembranous, glaucous abaxially, usually glabrous on both surfaces, sometimes abaxially pubescent, base cordate to subtruncate, margin entire, palmately 9–12-veined, 3–5 veins extending to base and slender, all prominent abaxially. Inflorescences paniculate, solitary or paired, 20-flowered with flowers in mostly sessile, sometimes umbel-like fascicles; peduncle slender, 2–17 cm; bracts ± oblong, almost as long as secondary peduncles; pedicels slender, 5–10 mm. Male flowers: sepals 4–8, membranous, greenish yellow, oblanceolate to obovate-elliptic, 1.4–3.5 mm; petals 6–8

or up to 9–12, fleshy, concave, shortly clawed, 1.5–2.5 mm; stamens 12–18, (0.6–)1.5–3 mm, usually longer than sepals. Female flowers: perianth as in male; staminodes 6–12, ca. 1 mm; carpels inserted on a distinct 0.5–1 mm stalk. Drupes purplish black; endocarp broadly crescent-moon-shaped, ca. 10 mm wide and 8 mm high, base sinuate, ca. 3 mm. Fl. Jun–Jul, fr. Aug–Sep.

Shrublands at roadsides, open forests; below 800 m. Anhui, Gansu, Guizhou, Hebei, Heilongjiang, Hubei (Baokang), Hunan, Jiangsu, Jiangxi, Jilin, Liaoning, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Zhejiang [Japan, Korea, Russia (S Siberia)].

Two recently described species based on single collections from N China (*Menispermum chinense*) and from Russia (*M. miersii*) differ only in minor differences of indumentum and other small quantitative characters and do not seem worthy of recognition.

Kundu and Guha (Adansonia n.s. 20: 225. 1998) suggested that *Menispermum mexicanum* Rose is only varietally distinct from *M. dauricum*.

Some collections suggest a rhizomatous rootstock.

The specific epithet is often misspelled as “*dahuricum*.”

17. STEPHANIA Loureiro, Fl. Cochinch. 2: 598, 608. 1790.

千斤藤属 qian jin teng shu

Clypea Blume.

Herbaceous or woody vines. Rootstock often tuberous, sometimes above ground; branches striate, slightly twining. Petiole often

very long, swollen at both ends; leaf blade deltoid, deltoid-rotund, or deltoid-subovate, peltate, papery, rarely membranous or sub-leathery, palmately veined. Inflorescences axillary or from axillary stems with leaves reduced or absent, rarely from old stems, usually umbelliform cymes, sometimes condensed into heads on discoid receptacles, often in compound umbels, rarely along thyrsoid axis. Male flowers: sepals in (1 or)2 symmetrical whorls of 3 or 4, free or occasionally connate at base; petals 3 or 4 in 1 whorl, rarely in 2 whorls or absent; stamens 2–6, usually 4, connate into a peltate synandrium, anthers dehiscing transversely. Female flowers: perianth symmetrical; sepals and petals each in 1 whorl of 3 or 4, or asymmetrical, sepal 1(or 2) and petals 2(or 3); staminodes absent; carpel 1, subovoid. Drupes red or orangish red, subglobose, slightly flattened on both sides, style scar near base; endocarp usually bony, obovoid to obovoid-rotund, abaxially bearing 1 or 2 rows of transverse ridges or columnar ornamentation on each side; condyle slightly concave on each side, perforate or not. Seed horseshoe-shaped; embryo horseshoe-shaped; endosperm fleshy; cotyledons subequal to or shorter than radicle.

About 60 species: tropical and subtropical Asia and Africa, a few in Oceania; 37 species (30 endemic) in China.

Plants of this genus contain more than 50 kinds of alkaloids. Their tuberous roots are widely used in traditional Chinese medicine and as local medicines.

- 1a. Perianth in female flowers symmetrical; sepals and petals each in whorls of 3 or 4; male and female flowers similar; main root cylindrical and fleshy or roots not enlarged.
- 2a. Inflorescences mostly slender axillary thyrses; male flowers with sepals usually in 1 whorl of 4; endocarp abaxially bearing 4 rows of ornamentation, 2 inner rows columnar and very prominent; condyle usually not perforate; [leaf blade abaxially densely pubescent]; main root cylindrical, fleshy (*S. subg. Botryodiscia*) 11. *S. tetrandra*
- 2b. Inflorescences umbelliform cymes, simple or compound, sometimes forming a terminal thyrse by reduction of apical leaves; male flowers with sepals in 2 whorls each of 3 or 4; endocarp abaxially bearing 2, 4, or 10 or more rows of ornamentation; [leaf blade abaxially often glabrous]; roots not tuberous and fleshy (*S. subg. Stephania*).
- 3a. Cymelets and flowers sessile or nearly so, tightly condensed into compound umbelliform cymes; endocarp abaxially ornamented with rows of 10 or slightly more (*S. sect. Stephania*).
- 4a. Leaf blade ca. as long as wide, abaxial surface glaucous 9. *S. japonica*
- 4b. Leaf blade longer than wide, abaxial surface usually green 10. *S. longa*
- 3b. Cymelets and flowers conspicuously pedicellate, loose, in simple, seldom compound, umbelliform cymes; endocarp abaxially ornamented with rows of 2 or 4 (*S. sect. Laxithyrsa*).
- 5a. Inflorescence compound with umbel-like cymelets themselves in secondary umbels; condyle perforate.
- 6a. Endocarp 10–12 mm, abaxially with 4 rows of columnar processes with ends swollen; palmate veins thick, conspicuously raised abaxially 7. *S. merrillii*
- 6b. Endocarp 4–5 mm, abaxially ornamented with 2 rows of transverse ridges; palmate veins slender, slightly raised abaxially 8. *S. delavayi*
- 5b. Inflorescence simple with cymelets borne directly on peduncle; endocarp abaxially ornamented with 2 or 4 rows each of less than 10 transverse ridges; condyle perforate or not.
- 7a. Sepals apically mucronate or acutely acuminate, never caudate.
- 8a. Condyle perforate 3. *S. gracilentia*
- 8b. Condyle not perforate.
- 9a. Leaf blade broadly ovate-triangular, usually wider than long 1. *S. herbacea*
- 9b. Leaf blade narrowly triangular, longer than wide 2. *S. elegans*
- 7b. Sepals conspicuously caudate at apex.
- 10a. Leaf blade margin repand dentate 6. *S. chingtungensis*
- 10b. Leaf blade margin entire.
- 11a. Petiole inserted 1–2 mm from base of leaf blade; leaf blade subpeltate, ovate-triangular or broadly triangular to subtriangular, longer than wide; condyle not perforate 4. *S. subpeltata*
- 11b. Petiole inserted ca. 10 mm from base of leaf blade; leaf blade conspicuously peltate, triangular, ca. as long as wide; condyle perforate 5. *S. sutchuenensis*
- 1b. Perianth in female flowers asymmetrical, occasionally also symmetrical within same inflorescence; sepal 1(–3), scalelike; petals 2(or 3); rootstock tuberous, often huge, often partly above ground (*S. subg. Tuberiphania*).
- 12a. Endocarp abaxially ornamented with transverse ridges; male and female inflorescences ± similar (*S. sect. Transcoctula*).
- 13a. Peduncle of inflorescence with disciform receptacle at apex, both male and female inflorescences capitate 18. *S. cephalantha*
- 13b. Peduncle of inflorescence without disciform receptacle at apex.

- 14a. Leaves with margin dentate; branches and leaves containing red juice 17. *S. dentifolia*
- 14b. Leaves entire or horned; branches and leaves not containing red juice.
- 15a. Endocarp abaxially ornamented with rows of 20–25 transverse ridges; condyle perforate; petals of male flowers with granular glands 16. *S. glabra*
- 15b. Endocarp abaxially ornamented with rows of less than 20 transverse ridges; condyle not perforate; petals of male flowers with or without glands.
- 16a. Inflorescence with simple umbelliform cymes; flowers purple; male petals not adaxially glandular; leaf blade usually less than 7(–9) cm long and wide.
- 17a. Male sepals ovate, 1.3–1.6 mm; leaves abaxially glabrous; peduncle 1–4 cm 12. *S. epigaea*
- 17b. Male sepals rounded, ca. 0.5 mm in diam.; leaves abaxially whitish puberulent; peduncle 0.5–1.5 cm 13. *S. brevipedunculata*
- 16b. Inflorescence with compound umbelliform cymes; flowers greenish yellow; leaf blade usually more than 10 cm long and wide.
- 18a. Male petal with margin extended, with 2 adaxial glands 14. *S. sinica*
- 18b. Male petal with margin involute, without adaxial glands 15. *S. intermedia*
- 12b. Endocarp abaxially ornamented with rows of columnar tubercles; male and female inflorescences ± different (*S. sect. Tuberiphania*).
- 19a. Endocarp tubercles apically obtuse, or slightly swollen and capitate; condyle perforate.
- 20a. Peduncles and umbellet pedicels not bracteate and bracteolate or occasionally with 1 or 2 reduced bracts; petals with verruculose or tuberculate processes inside.
- 21a. Sepals ca. 3 mm, abaxially densely papillate; leaf blade margin horned or horned dentate; fruit unknown 25. *S. macrantha*
- 21b. Sepals ca. 2 mm, abaxially not papillate; leaf blade margin entire; fruiting pedicels fleshy 26. *S. officinarum*
- 20b. Peduncles and umbellet pedicels bracteate and bracteolate; petals with or without processes inside.
- 22a. Petals of male flowers with lateral margins involute.
- 23a. Endocarp 5–6 mm; male petals abaxially conspicuously depressed, with many verruculose or lobed processes 19. *S. viridiflavens*
- 23b. Endocarp 9–10 mm; male petals abaxially not depressed, without verruculose processes 20. *S. brachyandra*
- 22b. Petals of male flowers with lateral margins not involute, with 2 large glands inside.
- 24a. Sepals and petals purple; branches and leaves containing purplish red juice 21. *S. yunnanensis*
- 24b. Sepals green; petals orangish yellow; branches and leaves not containing red juice.
- 25a. Branches and leaves black when dried; sepal margins involute when flower blooming 22. *S. lincangensis*
- 25b. Branches and leaves not black when dried; sepal margins not involute.
- 26a. Fruiting pedicel not fleshy; endocarp with columnar tubercles apically obtuse 23. *S. kuinanensis*
- 26b. Fruiting pedicel fleshy; endocarp with columnar tubercles apically swollen and capitate 24. *S. dicentrinifera*
- 19b. Endocarp tubercles abaxially with columnar ornamentation apically curved.
- 27a. Petals of male flowers with 2 large glands inside.
- 28a. Condyle not perforate 37. *S. miyiensis*
- 28b. Condyle perforate.
- 29a. Fruiting pedicel not fleshy; condyle perforate in middle 34. *S. kwangsiensis*
- 29b. Fruiting pedicel fleshy; condyle perforate laterally.
- 30a. Sepals of male flowers free without conspicuous claw; peduncle apically bracteate 35. *S. excentrica*
- 30b. Sepals of male flowers connate, inner whorl with conspicuous claw 36. *S. ebracteata*
- 27b. Petals in male flowers without glands inside.
- 31a. Fruiting pedicel fleshy.
- 32a. Branches and leaves containing red juice; sepals and petals purple; endocarp with columnar ornamentation short, apically slightly curved and hooklike; leaf blade less than 10 cm 32. *S. succifera*
- 32b. Branches and leaves containing light yellow or white juice; sepals green; petals orange; endocarp with columnar ornamentation conspicuously curved and hooklike; leaf blade 10–16 cm 33. *S. hainanensis*

- 31b. Fruiting pedicel not fleshy.
- 33a. Petals of male flowers with margin conspicuously thickened; sepals abaxially hispidulous or pubescent 27. *S. dolichopoda*
- 33b. Petals of male flowers with margin not thickened; sepals abaxially not glabrous.
- 34a. Branches and leaves without red juice; sepals green; petals yellow or orange.
- 35a. Endocarp bearing columnar ornamentation, each row of 18–20; leaves more than 10 cm 28. *S. mashanica*
- 35b. Endocarp bearing columnar ornamentation, each row of 20–25; leaves usually less than 10 cm 29. *S. micrantha*
- 34b. Branches and leaves with red juice; sepals and petals purple.
- 36a. Umbellet pedicels transparent when dry; sepals of male flowers with margin membranous; petiole rarely less than 2 × as long as leaf blade 30. *S. longipes*
- 36b. Umbellet pedicels not transparent when dry; sepals of male flowers with margin not membranous; petiole subequal to or slightly longer than leaf blade 31. *S. dielsiana*

1. *Stephania herbacea* Gagnepain, Bull. Soc. Bot. France 55: 40. 1908.

草质千金藤 cao zhi qian jin teng

Herbaceous vines; neck of rootstock slender, prostrate, node growing fiberlike roots. Branchlets thin, glabrous. Petiole longer than leaf blade; leaf blade peltate, broadly ovate-triangular, 4–6 × 4.5–8 cm, submembranous, whitish green abaxially, glabrous on both surfaces, base subtruncate, margin entire or lobed, apex obtuse, sometimes finely mucronate, palmately 7- or 8-veined, slender, slightly prominent abaxially, fine reticulation slightly conspicuous, marginal vein well defined. Inflorescences simple umbelliform cymes, axillary; peduncle filamentous, 2–4 cm; cymelets 7 or 8, often reduced to single flowers. Male flowers: sepals 6 in 2 whorls, membranous, obovate, 1.8–2 × ca. 1.3 mm, base attenuate or sharply narrow, 1-nerved; petals 3, rhombic-rounded, 0.7–1 × ca. 1 mm; synandrium shorter than petals. Female flowers: sepals and petals (2 or)3, subequal to sepals of male flowers, petals shorter and thicker; stigma 3-lobed. Drupes red, rotund, 7–8 mm; condyle not perforate. Fl. summer.

• Roadside shrublands on slopes. Guizhou, W Hubei, Hunan, SE and SW Sichuan.

2. *Stephania elegans* J. D. Hooker & Thomson, Fl. Ind. 1: 195. 1855.

雅丽千近藤 ya li qian jin teng

Herbaceous vines. Branches slender, striate, glabrous or subglabrous. Petiole 2–4 cm; leaf blade conspicuously peltate, narrowly triangular or ovate-triangular (sometimes subtriangular), 5–10 × 2.5–5.5 cm, papery, usually brown when dry, adaxially glossy, both surfaces glabrous, base subtruncate to slightly concave, sometimes cordate, apex slightly acuminate, sometimes obtuse, minutely mucronate, upward and downward each palmately 4- or 5-veined, raised abaxially, reticulation slightly conspicuous. Inflorescences simple (or compound) umbelliform cymes; peduncles slender and straight; flowers with pedicels, light green or purple. Male flowers: sepals 6, dark purple, obovate, ca. 1.6 × 1 mm, glabrous. Female flowers: perianth as in male flowers. Drupes red, broadly obovate-globose, ca. 7 mm, base subtruncate; endocarp 5–6 mm; condyle not perforate. Fr. Nov.

Yunnan (Tengchong, Zhenyuan) [NE India, Nepal].

3. *Stephania gracilentata* Miers, Ann. Mag. Nat. Hist., ser. 3, 18: 15. 1866.

纤细千斤藤 xian xi qian jin teng

Herbaceous vines, glabrous. Branches slender, brown when dry, longitudinally striate. Petiole 3–10 cm; leaf blade conspicuously peltate, triangular-rotund, 3–7 cm, width subequal to length or slightly wider, thinly papery or submembranous, pale on both surfaces, especially abaxially, base subtruncate, apex often finely mucronate, palmately 8- or 9-veined, fine reticulation slightly conspicuous. Inflorescences simple umbelliform cymes, axillary or on short axillary branches with reduced leaves; peduncle rather slender, 1–4 cm; cymelets 5 or 6; flowers purple; pedicel filamentous, 0.5–1 mm. Male flowers: sepals 6, obovate-oblong to broadly elliptic, 1.5–2 mm; petals 3 or 4, slightly fleshy, broadly cuneate to obcordate or rotund, 0.8–1 mm; synandrium ca. 1 mm. Female flowers: perianth as in male flowers. Drupes obovate, slightly flattened; condyle perforate. Fl. Jun.

Forests on mountain slopes; 1700–2400 m. S Xizang (Nyalam) [Nepal].

4. *Stephania subpeltata* H. S. Lo, Acta Phytotax. Sin. 16(1): 22. 1978.

西南千金藤 xi nan qian jin teng

Herbaceous and climbing vines, glabrous. Stems slender, with roots on lower part, rarely branched; branches green, longitudinally striate. Petiole slender and straight, shorter than leaf blade; leaf blade subpeltate, insertion 0.1–0.2 cm from margin, ovate-triangular or broadly triangular to subtriangular, 3.5–10 × 2.5–5.5 cm, thinly leathery, often dark green when dry, base slightly concave, rarely conspicuously cordate or slightly concave, apex often conspicuously contracted, caudate-acuminate, or acutely acuminate, slightly obtuse, palmately 5-veined, fine reticulation slightly raised on both surfaces. Male and female inflorescences similar, simple umbelliform cymes, sparse and few flowered; peduncle filamentous, 1.5–6.5 cm; cymelets 3–5, fascicled; bracteole narrowly lanceolate; flowers purple. Male flowers: sepals 6, outer whorl ovate, inner whorl sublan-ceolate, 1.2–1.4 mm, apex caudate; petals 3, broadly cuneate,

ca. 0.5 mm. Female flowers: sepals 3, broadly ovate, ca. 1.5 mm, caudate; petals 3, oblate to broadly cuneate, ca. 0.6 mm; stigma 3-lobed. Drupes red, obovate-globose; endocarp 4.5–5 × ca. 3 mm; condyle not perforate. Fl. Nov.

• Shrublands. Guangxi (Longlin), Sichuan (Miyi), Yunnan (Chenggao, Weixi, Wenshan, Yangbi).

5. *Stephania sutchuenensis* H. S. Lo, Acta Phytotax. Sin. 16(1): 25. 1978.

四川千斤藤 si chuan qian jin teng

Herbaceous vines, glabrous. Branches slender, slightly hard, straightly striate. Petiole 4–7 cm; leaf blade peltate, insertion ca. 1 cm from margin, triangular, usually 6–10 × 5.5–9.5 cm, thinly leathery, base subtruncate, apex sometimes obtuse, palmately 7- or 8-veined, conspicuously raised abaxially, reticulation slightly conspicuous. Inflorescences simple umbelliform cymes, axillary, slightly fleshy; peduncle of male inflorescences slender and straight, as long as petiole, apex ebracteolate; cymelets 4–8, fascicled, 3–7-flowered. Male flowers: sepals 6 in 2 whorls, ovate-rounded or ovate, 1.7–2 mm, cuneate base 0.6–0.9 mm, apex caudate-acuminate; petals 3, slightly fleshy, conchiform, 0.6–0.7 × 1–1.2 mm. Female flowers: sepals and petals 3, size and shape as in male flowers; pistillate style subequal to petal. Infructescences axillary, similar to male inflorescences in structure; fruiting peduncle 8–9 cm. Endocarp red, obovate, ca. 7 × 3 mm; condyle perforate. Fl. summer.

• Forests. Sichuan (Emei Shan and vicinity).

6. *Stephania chingtungensis* H. S. Lo, Acta Phytotax. Sin. 16(1): 25. 1978.

景东千斤藤 jing dong qian jin teng

Herbaceous vines, glabrous. Stems slender, longitudinally striate, 1.5–2 mm in diam. Petiole longer than leaf blade; leaf blade conspicuously peltate, broadly triangular to oblate-triangular, 5–11 × 6–10 cm, papery or thinly papery, abaxially olive green, adaxially dark green when dry, base subtruncate, sometimes slightly rounded or concave, margin conspicuously repand dentate, apex obtuse or acuminate, palmately 10- or 11-veined, reticulation conspicuous. Inflorescences simple umbelliform cymes, axillary, usually on leafless short branches, slender and slightly fleshy; peduncle 1.5–2.5 cm; cymelets 3 or 4; pedicel slender, 1–2 mm. Male flowers: sepals 6 in 2 whorls, inner and outer whorls ± similar, elliptic, ca. 2 mm, apex caudate; petals 3, slightly fleshy, to 1 mm; synandrium ca. 1 mm. Female flowers unknown. Infructescences axillary, slightly twining, on leafless or microphylline short branches; fruiting peduncle slender, 3–5 cm; fruiting pedicels ca. 4 mm. Endocarp obovate, ca. 7 × 5 mm; condyle perforate.

• S Yunnan.

7. *Stephania merrillii* Diels in Engler, Pflanzenr. 46(IV.94): 268. 1910.

台湾千近藤 tai wan qian jin teng

Stephania sasakii Hayata ex Yamamoto.

Woody vines, 3–5 m or longer. Root thick, rough and

contracted, 1–2 cm in diam. Old branches brown, longitudinally 10-grooved, ca. 1 cm in diam.; young branches green, ca. 4 mm in diam. Petiole 7–9 cm or longer, compressed laterally, striate; leaf blade peltate, insertion ca. 2 cm from margin, broadly ovate, 9–10(–16) × 8.5–9(–15) cm, thinly leathery or thickly papery, base usually rounded, margin slightly involute, apex mucronate, palmately ca. 12-veined, veins thicker, very prominent abaxially, fine reticulation very conspicuous. Inflorescences compound umbelliform cymes, axillary or on old leafless stems; peduncle 6–12 cm; umbellet pedicels ca. 8; bracts small, linear. Male flowers: sepals 6(or 8) in 2 whorls, membranous, outer 3 usually lanceolate or suboblong, 1.2–1.5 mm, ciliate, mucronate, inner whorl obovate, rarely spatulate, concave, ca. 2 mm, base clawed, margin dentate, apex rounded; petals 3(or 4), light yellow or white, broadly ovate or rotund, deeply concave, with tuberculate processes inside; synandrium with 6 anthers. Female flowers unknown. Drupes red, broadly obovate to rotund, ca. 12 × 10 × 4 mm, compressed laterally; endocarp 10–12 mm, abaxially with 4 rows of columnar processes with ends swollen. Fl. spring and summer.

• Taiwan (Lan Yu).

8. *Stephania delavayi* Diels in Engler, Pflanzenr. 46(IV.94): 275. 1910.

一文钱 yi wen qian

Stephania graciliflora Yamamoto.

Slender herbaceous vines, 1–2 m. Stems and branches slender, striate, glabrous. Petiole usually equal to leaf blade in length; leaf blade conspicuously peltate, triangular-rotund, 3–5(–7) cm, width equal to length or slightly longer, thinly papery, abaxially pinkish green, both surfaces glabrous, base subtruncate, apex obtuse, with a finely mucronate acumen, palmately 9- or 10-veined, slender, together with dense fine reticulation slightly raised abaxially, brown when dry. Inflorescences axillary or on short axillary branches with reduced leaves, compound umbelliform cymes; peduncle 1–3.5 cm or longer; umbellet rays 3–7, 0.3–1.2 cm, slender; pedicel slender, less than 0.5 mm. Male flowers: sepals 6(or 8) in 2 whorls, thin, obovate-cuneate or broadly obovate-cuneate, rarely obovoid-rounded, 1–1.2 × 0.5–0.8(–1) mm; petals 3 or 4, slightly fleshy, subobdeltoid or broadly cuneate, ca. 0.5 mm; synandrium ca. 0.7 mm. Female flowers: sepals and petals 3(or 4), size and shape as in male flowers; carpel glabrous, stigma often 3-lobed, lobes long and pointed. Drupes red, glabrous; endocarp obovate, 4–5 mm, abaxially ornamented with 2 rows of transverse ridges.

• Shrublands, along fences, roadsides. S Guizhou, S Sichuan, Yunnan.

9. *Stephania japonica* (Thunberg) Miers, Ann. Mag. Nat. Hist., ser. 3, 18: 14. 1866.

千斤藤 qian jin teng

Vines, glabrous or pubescent. Root woody, not tuberous, brownish yellow. Stems slender, slightly woody when old, sometimes prostrate and rooting at nodes. Petiole 3–12 cm; leaf blade conspicuously peltate, usually triangular-rotund or broadly triangular-ovate to rotund, 5–12(–15) cm, as wide as

or slightly wider than long, papery to thinly leathery, abaxially glabrous or hirsute, often glaucous, adaxially glossy, base usually broadly rounded, apex with a finely mucronate acumen, palmately 8–11-veined, raised abaxially, reticulation slightly raised, conspicuous. Inflorescences compound umbelliform cymes, usually axillary, rarely 2 or few on short axillary branches; peduncle to 6 cm; rays often very short, umbellets very condensed, headlike; axes glabrous or pubescent; pedicels almost absent. Male flowers: sepals 6 or 8 in 2 whorls, membranous, yellowish green, oblanceolate or obovate-elliptic to spatulate or narrowly elliptic, 1–1.5 mm, glabrous or pubescent; petals 3 or 4, slightly fleshy, yellow, broadly obovate to rotund, 0.5–1 mm, glabrous, rarely apex slightly concave; synandrium 0.5–1 mm, exerted or not, anthers 6. Female flowers: sepals 3 or 4, shape and size as in male or smaller; petals 3 or 4, shape and size as in male or slightly smaller; carpel ovoid, stigma lacerate. Infructescences with hard and slightly curved umbellets pedicels. Drupes red, obovate to subglobose, 6–8 mm; endocarp 5–6 mm, abaxially ornamented with 10 or slightly more rows of transverse ridges; condyle perforate or not. Fl. spring and summer, fr. autumn and winter.

Village margins, shrublands, open forests, forest margins, limestone mountains. Anhui, Chongqing, Fujian, Guangxi, S Guizhou, Hainan, S Henan, Hubei, Hunan, Jiangsu, Jiangxi, E and SW Sichuan, NE and S Yunnan, Zhejiang [Bangladesh, India, Indonesia (Java), Japan, Korea, Laos, Malaysia, Myanmar, Nepal, Sri Lanka, Thailand, ?Vietnam; Australia, Pacific islands].

- 1a. Inflorescences glabrous; condyle usually not perforate 9a. var. *japonica*
 1b. Inflorescences pubescent; condyle perforate.
 2a. Leaf blade abaxially hirsute 9b. var. *discolor*
 2b. Leaf blade abaxially glabrous 9c. var. *timoriensis*

9a. *Stephania japonica* var. *japonica*

千斤藤(原变种) qian jin teng (yuan bian zhong)

Menispermum japonicum Thunberg in Murray, Syst. Veg., ed. 14, 892. 1784.

Stems glabrous or sparsely pubescent. Petiole 3–12 cm; leaf blade abaxially glabrous except sometimes near petiole. Peduncle almost absent; inflorescence axes glabrous. Male flowers: sepals obovate-elliptic to spatulate, glabrous. Drupes obovate to suborbiculate, ca. 8 mm; condyle usually not perforate.

Village margins, shrublands in open fields. Anhui, Fujian, Hainan, S Henan (Jigong Shan), Hubei, Hunan, Jiangsu, Jiangxi, Zhejiang [India, Japan, Korea, Malaysia, Sri Lanka, Thailand; Australia, Pacific islands].

9b. *Stephania japonica* var. *discolor* (Blume) Forman, Kew Bull. 11: 56. 1956.

桐叶千斤藤 tong ye qian jin teng

Clypea discolor Blume, Bijdr. 26. 1825; *Cissampelos hernandiifolia* Willdenow; *Stephania hernandiifolia* (Willdenow) Walpers; *S. hernandiifolia* var. *discolor* (Blume) Miquel.

Stems pubescent. Petiole 3–7 cm or slightly longer; leaf

blade abaxially hirsute. Peduncle 1.5–5.5 cm; inflorescence axes pubescent. Male flowers: sepals oblanceolate to spatulate, sometimes narrowly elliptic, pubescent. Drupes obovoid-subglobose; condyle perforate. Fl. summer, fr. autumn.

Open forests or shrublands, limestone mountains. Guangxi, S Guizhou, E and SW Sichuan, NE and S Yunnan [India, ?Laos, Malaysia, Myanmar, Nepal, Thailand, ?Vietnam; E Australia].

9c. *Stephania japonica* var. *timoriensis* (Candolle) Forman, Kew Bull. 11: 49. 1956.

光叶千金藤 guang ye qian jin teng

Cocculus japonicus Candolle var. *timoriensis* Candolle, Prodr. 1: 96. 1824; *C. forsteri* Candolle; *Stephania forsteri* (Candolle) A. Gray.

Stems glabrous. Petiole usually shorter than or subequal to leaf blade; leaf blade abaxially glabrous except sometimes near petiole. Peduncle 1.5–6 cm; inflorescence axes pubescent. Male flowers: sepals spatulate-oblong to narrowly elliptic, glabrous. Drupes obovoid, 6–7 mm; condyle perforate. Fl. spring, fr. autumn and winter.

Forest margins. N Guangxi (Longlin), S Yunnan (Xishuangbanna) [Bangladesh, Indonesia (Java); Australia, Pacific islands].

10. *Stephania longa* Loureiro, Fl. Cochinch. 2: 608. 1790.

粪箕笃 fen ji du

Stephania hispidula (Yamamoto) Yamamoto; *S. japonica* (Thunberg) Miers var. *hispidula* Yamamoto.

Herbaceous vines, 1–4 m or longer, glabrous except for inflorescence. Branches slender, striate. Petiole 1–4.5 cm, often twining at base; leaf blade conspicuously peltate, triangular-ovate, 3–9 × 2–6 cm, papery, adaxially dark brown, abaxially light green, sometimes pinkish green, base subtruncate or slightly rounded, rarely slightly concave, apex obtuse, with a finely mucronate acumen, palmately 10- or 11-veined. Inflorescences compound umbelliform cymes, axillary; peduncle 1–4 cm; male inflorescences more slender, hispidulous; umbellets very condensed, headlike; pedicels ± concealed by flowers. Male flowers: sepals (6 or)8 in 2 whorls, cuneate or obovate, ca. 1 mm, abaxially with short papillary hairs; petals 4, sometimes 3, greenish yellow, usually rotund, ca. 0.4 mm; synandrium ca. 0.6 mm. Female flowers: sepals and petals (3 or)4, ca. 0.6 mm; ovary glabrous, stigma lobes divaricate. Drupes red, 5–6 mm; endocarp abaxially ornamented with rows of 10 or slightly more. Fl. late spring–early summer, fr. autumn.

Shrublands, forest margins. Fujian, Guangdong, Guangxi, Hainan, Taiwan, SE Yunnan [Laos].

11. *Stephania tetrandra* S. Moore, J. Bot. 13: 225. 1875.

粉防己 fen fang ji

Herbaceous vines, 1–3 m high. Main root fleshy, cylindrical. Branchlets longitudinally striate. Petiole 3–7 cm; leaf blade narrowly peltate, broadly triangular, sometimes triangular-rotund, 4–7 × 5–8.5 cm, papery, both surfaces pubescent or only abaxially, base slightly emarginate or truncate, apex with a mucronate acumen, palmately 9- or 10-veined, more slender,

reticulation very dense, conspicuous. Inflorescences capitate; bracts small or very small. Male flowers: sepals 4 or sometimes 5, usually obovate-elliptic, including claw ca. 0.8 mm; petals 5, fleshy, ca. 0.6 mm, margin involute; synandrium ca. 0.8 mm, anthers 4. Female flowers: sepals and petals as in male flowers. Drupes red, subglobose when mature; endocarp ca. 5.5 mm in diam., abaxially bearing 4 rows of ornamentation, 2 inner rows columnar and very prominent; condyle usually not perforate. Fl. summer, fr. autumn.

- Shrublands at village margins, open fields, roadsides. Anhui, Fujian, Guangdong, Guangxi, Hainan, Hubei, Hunan, Jiangxi, Taiwan, Zhejiang.

12. *Stephania epigaea* H. S. Lo, Acta Phytotax. Sin. 16(1): 34. 1978.

地不容 di bu rong

Herbaceous deciduous vines, glabrous. Root tuberous, huge, usually oblate, dark and grayish brown. Young branches slightly fleshy, often purplish red, glaucous, striate when dry. Petiole usually 4–6(–11) cm; leaf blade peltate, insertion 1–2 cm from margin, oblate, rarely rotund, 3–5(–7) × 5–6.5(–9) cm, membranous when dry, abaxially slightly glaucous, base usually rounded, apex rounded or occasionally cuspidate, palmately 8- or 9-veined, slender. Inflorescences simple umbelliform cymes, axillary, slightly fleshy, often purplish red and glaucous; peduncle of male inflorescences (0.5–)1–4 cm; cymelets few to 10, fascicled, 2- or 3(–7)-flowered. Male flowers: sepals 6, often purple, ovate or elliptic-ovate, 1.3–1.6 mm; petals 3 or occasionally 5 or 6, slightly fleshy, purple or orange with purple dots, broadly cuneate or subdeltoid, 0.4–0.7 mm; synandrium 0.4–0.5 mm. Female inflorescences similar to male inflorescences but denser; peduncle 1–3 cm. Female flowers unknown. Fruiting pedicels short and fleshy. Drupes red; endocarp obovate, 6–7 × ca. 5 mm. Fl. spring, fr. summer.

- Shrublands, along fences, roadsides. S Guizhou, S Sichuan, Yunnan.

Stephania epigaea is regarded as over-harvested for medicinal usage (Annex 2 of Identification and Conservation of Important Plant Areas for Medicinal Plants in the Himalaya, Plantlife).

13. *Stephania brevipedunculata* C. Y. Wu & D. D. Tao in C. Y. Wu, Fl. Xizang. 2: 159. 1985.

短梗地不容 duan geng di bu rong

Vines. Root tuberous. Stems striate. Petiole ca. 4 cm; leaf blade deltoid, length subequal to width, ca. 4.5 cm long and wide, abaxially grayish green, adaxially green, abaxially sparsely whitish puberulent. Inflorescences simple umbelliform cymes; peduncle short, 0.5–1.5 cm, very few flowered; bracts 2 or 3, 1.8–2.2 mm. Male flowers: sepals 3, purple, rounded, less than 0.5 mm in diam.; petals 3, spatulate, alternate to sepals, very shortly sessile. Female flowers unknown. Fruit unknown. Fl. early summer.

- Slopes; 2000–2400 m. S Xizang (Gyirong, Nyalam).

14. *Stephania sinica* Diels in Engler, Pflanzenr. 46(IV.94): 272. 1910.

汝兰 ru lan

Deciduous vines slightly fleshy, glabrous. Branches thick, longitudinally striate, often hollow. Petiole to 30 cm, twining when dry, apex swollen; leaf blade conspicuously peltate, triangular to triangular-rotund, 10–15 cm or longer, membranous when dry or ± papery, base subtruncate to slightly rounded, rarely slightly emarginate, margin sinuate to entire, palmately 9- or 10-veined, slightly wide and flat, slightly raised abaxially, reticulation conspicuous abaxially. Inflorescences compound umbelliform cymes, axillary; peduncle and umbellet pedicels fleshy, without bract and bracteole. Male flowers: sepals 6, slightly fleshy, transparent when dry, subobovate-oblong, 1–1.3 mm, inner whorl slightly wider; petals 3, sometimes 4, shortly and broadly obovate, ca. 0.8 mm inside, with 2 large glands; synandrium 0.7–0.8 mm. Female inflorescences also composed of compound umbelliform cymes with umbellet pedicels shorter and thicker. Female flowers: sepal 1; petals 2, glands inside sometimes not conspicuous. Infructescences with peduncles 5 cm or longer; umbellet pedicels 1–1.5 cm; fruiting pedicel fleshy, black when dry. Drupes with endocarp 6–7 mm. Fl. Jun, fr. Aug–Sep.

- Margins of forest clearings. N Guizhou, SW and W Hubei, Hunan, C, E, and S Sichuan, NE Yunnan.

15. *Stephania intermedia* H. S. Lo in C. Y. Wu & H. W. Li, Fl. Yunnan. 3: 247. 1983.

河谷地不容 he gu di bu rong

Deciduous vines herbaceous or slightly woody at base, glabrous. Branches and branchlets terete, grayish brown when dry, longitudinally striate. Petiole longer than or subequal to leaf blade, slightly thick; leaf blade peltate, insertion 2–3 cm from margin, usually inconspicuously triangular-rotund, 8–15 cm, width subequal to length, papery, both surfaces dull, base subtruncate or slightly emarginate, apex obtuse or slightly rounded, often with a finely mucronate acumen, palmately 9–12-veined, veins thick, together with fine reticulation raised abaxially, becoming brown when dry, slightly glossy. Inflorescences compound umbelliform cymes, axillary; male peduncle 3–5 cm; umbellet rays 5 or 6, ca. 2 cm; cymelets 4–6-fascicled at end of umbellet pedicel; bracts and bracteoles linear or linear-subulate. Male flowers: sepals 6 in 2 whorls, outer whorl elliptic-obovate, 2–2.3 mm, apex obtuse or mucronate, inner whorl slightly smaller, base abruptly narrowed, apex rounded; petals 3, orangish yellow, very broad, 0.8–1 × 1.5–1.8 mm, margin involute, imbricate; synandrium 0.6–0.7 mm. Female inflorescences and flowers unknown. Infructescences compound umbelliform with peduncle thick, 5–7 cm; umbellet pedicels 7–9, 1–2 cm, prostrately extended; fruiting pedicel not fleshy. Drupes obovate, ca. 6 mm. Fl. May–Jul, fr. Jul–Aug.

- Stony slopes in hot valleys. Yunnan (Gejiu).

16. *Stephania glabra* (Roxburgh) Miers, Ann. Mag. Nat. Hist., ser. 3, 18: 14. 1866.

西藏地不容 xi zang di bu rong

Cissampelos glabra Roxburgh, Fl. Ind., ed. 1832, 3: 840. 1832.

Herbaceous vines. Stems striate, glabrous, hollow. Petiole relatively slender, 5–15 cm or longer, geniculate and thickened at base; leaf blade narrowly peltate, broadly ovate or rotund, 4–14 × 4–12 cm or slightly longer, papery or membranous, abaxially pale, both surfaces glabrous, base rounded, apical margin horned, palmately veined, 5 veins upward and raised abaxially. Male inflorescences axillary or on leafless old stems; peduncle 4–8 cm; umbellet rays usually 6, filamentous. Male flowers: sepals 6, outer 3 linear-oblong, 2–2.5 × ca. 0.5 mm, inner whorl obovate, 2–2.8 × 0.5–0.7 mm; petals 3, thicker, obovate, ca. 1.8 × 0.8 mm, with granular glands above middle part, apex often 3-lobed; synandrium 1.5–2 mm. Female flowers unknown. Infructescences with condensed umbellet pedicels ca. 1.5 cm; fruiting pedicels 0.6–0.8 mm. Drupes obovate, flattened; endocarp ornamented abaxially with rows of 20–25 transverse ridges; condyle perforate. Fl. Jun–Jul.

Shrublands. S Xizang (Gyirong, Nyalam) [Bangladesh, E, NW, and S India, Myanmar, Nepal, Thailand].

Stephania glabra is regarded as endangered in some parts of its range because of its overuse as a medicinal plant (Chhetri et al., Curr. Sci. 89: 267. 2005).

17. *Stephania dentifolia* H. S. Lo & M. Yang, Guihaia 8: 318. 1988.

齿叶地不容 chi ye di bu rong

Herbaceous vines, glabrous. Roots large and tuberous. Branches fleshy, containing red juice, longitudinally striate. Petiole 2–4 cm; leaf blade conspicuously peltate, oblate in outline, 2–4(–8) × 2.5–4.4(–9) cm, slightly fleshy, base truncate or slightly rounded, margin undulately toothed, apex obtuse or mucronate, palmately 8–10-veined, slightly raised abaxially. Male inflorescences compound umbelliform cymes, axillary, solitary or paired; peduncle slender, 0.8–2.5 cm; umbellet pedicels 4–6, 0.3–1 cm; bracts and bracteoles linear-cuneate, 2–2.5 mm, glabrous or very shortly hispid. Male flowers: sepals 6 in 2 whorls, outer whorl elliptic, ca. 1.7 × 0.9–1 mm, without claw, abaxially with very short hairs along midrib; petals 3, fleshy, ca. 0.8 × 1.4 mm, with tubercles inside; synandrium ca. 0.9 mm. Female inflorescences condensed into capitula; peduncle slender, 1–1.5 cm; bracts filamentous, 1–3 mm. Female flowers: sepal 1, minute; petals 2, fleshy. Fruits unknown. Fl. Jun–Jul.

• SW Yunnan.

18. *Stephania cephalantha* Hayata, Icon. Pl. Formosan. 3: 12. 1913 [*“cepharantha”*].

金钱调乌龟 jin qian diao wu gui

Stephania disciflora Handel-Mazzetti; *S. tetrandra* S. Moore var. *glabra* Maximowicz.

Herbaceous vines, usually 1–2 m or longer, glabrous. Roots tuberous, sometimes irregular, brown, with many projecting lenticels. Branchlets slender, purplish red. Petiole slender, 1.5–7 cm; leaf blade triangular-oblate to rotund, 2–6 × 2.5–6.5 cm, membranous or papery, base rounded or subtruncate, margin entire or subrepand, apex with a finely mucronate acumen, palmately 7–9-veined. Male inflorescences often in axillary panicles, capitate, with discoid receptacle, peduncle fila-

mentous, 1–2 cm; female inflorescences similar, solitary and axillary, peduncle thicker, 1–2 cm. Male flowers: sepals 4 or 6(or 8), spatulate or subcuneate, 1–1.5 mm; petals 3 or 4(–6), rotund or broadly obovate, ca. 0.5 mm; synandrium shorter than sepals. Female flowers: sepals 1 or 2, occasionally 3(–5), ca. 0.8 mm or longer; petals 2(–4), fleshy, smaller than sepal. Drupes red, broadly rotund, ca. 6.5 mm. Fl. Apr–May, fr. Jun–Jul.

• Village margins, open fields, forest margins. Anhui, Fujian, Guangdong, Guangxi, E and S Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, ?Shanxi, E and S Sichuan, Taiwan, Zhejiang.

19. *Stephania viridiflavens* H. S. Lo & M. Yang, Bull. Bot. Res., Harbin 2(1): 42. 1982.

黄叶地不容 huang ye di bu rong

Deciduous and herbaceous vines. Stems slightly woody at base. Petiole subequal to or longer than leaf blade, often twining at base; leaf blade triangular-rounded to rotund, length and width usually 8–15(–20) cm, less than 8 cm when on lateral branches, papery, grayish yellow when dry, both surfaces glabrous, base subtruncate, rounded, or slightly emarginate, margin entire or irregularly repand, seldom horny on one side or both sides, apex mucronate or slightly obtuse, palmately 11–14-veined, slightly raised abaxially and bright yellow when dry. Inflorescences compound umbelliform cymes, axillary or on short axillary branches with reduced or no leaves; male peduncle usually longer than petioles, apex with few to 10 linear or sometimes foliaceous bracts; umbellet pedicels 5–12, 1.5–5 cm; cymelets many fascicled on end of umbellet pedicel, slightly condensed. Male flowers: sepals 6 in 2 whorls, greenish yellow, outer whorl elliptic or rhombic-elliptic, rarely obovate-cuneate, 2–2.2 × 1.4–1.6 mm, apical margin often involute, inner whorl similar, sometimes broadly obovate, to 2 mm wide; petals 3, thick, fleshy, orangish yellow, 1.1–1.2 × ca. 1.5 mm, margin with both sides involute, abaxially concave, with many verruculose or lobed processes, apex slightly emarginate; synandrium 0.5–0.7 mm. Female inflorescences condensed to capitula; peduncles usually much shorter than petioles, slightly stout; umbellet pedicel, cymelet pedicels, and pedicels very short. Female flowers: sepal 1, minute; petals 2, slightly larger. Drupes red, broadly obovate; endocarp 5–6 mm.

• Limestone hills. C and SW Guangxi, S Guizhou, SE Yunnan.

The huge, irregularly globose rootstock of *Stephania viridiflavens* contains abundant rotundine, which is used medicinally in Guangxi and Yunnan.

20. *Stephania brachyandra* Diels in Engler, Pflanzenr. 46 (IV.94): 275. 1910.

白线薯 bai xian shu

Deciduous and herbaceous vines. Stems slightly twining, light gray or slightly brown when dry, longitudinally striate, glabrous. Petiole longer than or subequal to leaf blade; leaf blade peltate, insertion 1.5–3 cm from base, triangular or subrounded, 8–18 cm, width subequal to length, thinly papery, both surfaces glabrous or abaxially slightly puberulent along veins, base subtruncate to subrounded, margin undulate to subentire,

apex obtuse or sometimes mucronate, palmately 10-veined, raised abaxially, reticulation slender and visible. Inflorescences compound umbelliform cymes, axillary or on short axillary branches with reduced leaves. Male inflorescences slightly slender; peduncle 3–7 cm; umbellet pedicels 5–7, 1.5–3 cm; cymelets slightly dense. Male flowers: pedicel ca. 0.5 mm; sepals 6, outer whorl 1–1.3 mm, inner whorl obovate or broadly obovate, 1.7–2.2 mm, relatively broader; petals 3(or 4), fleshy, very broad, 0.8–1 × 1.5–1.9 mm, margin involute, imbricate; synandrium 0.5–0.7 mm. Female inflorescences condensed to capitula; umbellet pedicel and cymelet pedicel absent when blooming. Female flowers: sepal usually 1, ovate-lanceolate, ca. 1 mm; petals 2, rotund, ca. 0.6 mm. Fruiting pedicel not fleshy. Drupes red, broadly obovate; endocarp 9–10 × ca. 8 mm. Fl. May–Jun, fr. Jun–Aug.

Ravine sides in forests; ca. 1000 m. SE Yunnan [Myanmar].

The tuberous rootstock of *Stephania brachyandra* contains the alkaloid isocorydine.

21. *Stephania yunnanensis* H. S. Lo, Bull. Bot. Res., Harbin 2(1): 45. 1982.

云南地不容 *yun nan di bu rong*

Herbaceous and deciduous vines, 4–5 m, glabrous. Stems and leaves containing red juice. Petiole subequal to or slightly longer than leaf blade; leaf blade soft, triangular-rounded to triangular-oblate, 5–11 cm, length subequal to or slightly longer than width, thinly papery, both surfaces glabrous, base subtruncate or slightly emarginate, apex mucronate or obtuse, entire or undulate, palmately (9 or) 10-veined, raised abaxially, together with reticulation brown when dry. Inflorescences compound umbelliform cymes. Male inflorescences axillary or 2 or 3 borne on short axillary branches, slightly fleshy and slender; peduncle 2–6 cm, or longer; umbellet pedicels 4–8, up to 2.5 cm; bracts lanceolate-linear, 1.5–2.5 mm, occasionally 1–3 foliaceous, up to 1.5 cm. Male flowers: sepals 6 in 2 whorls, with purplish stripes, outer whorl smaller, obovate to oblanceolate, 1.2–1.6 mm, apex mucronate, inner whorl rhombic-cuneate, 2–2.2 × ca. 1.8 mm, base abruptly clawed below middle; petals 3, conchiform, ca. 1 × 1.8–2 mm. Female flowers and inflorescences unknown. Infructescences compound umbelliform; peduncle slightly slender, 5–7 cm; umbellet pedicels 7–11, 1–2.5 cm; fruiting pedicel not fleshy, ca. 5 mm. Drupes red; endocarp obovate-rounded, 6–7 mm.

• Limestone hills, shrublands at ditch sides. Yunnan.

Stephania yunnanensis is regarded as over-harvested for medicinal usage (Annex 2 of Identification and Conservation of Important Plant Areas for Medicinal Plants in the Himalaya, Plantlife).

1a. Sepals abaxially glabrous 21a. var. *yunnanensis*
1b. Sepals abaxially hispidulous 21b. var. *trichocalyx*

21a. *Stephania yunnanensis* var. *yunnanensis*

云南地不容(原变种) *yun nan di bu rong* (*yuan bian zhong*)

Sepals abaxially glabrous.

• Limestone hills. Yunnan (Gejiu).

The tuberous roots contain the alkaloids rotundine and sinomenine, which have a calming, muscle-relaxing effect.

21b. *Stephania yunnanensis* var. *trichocalyx* H. S. Lo & M. Yang, Guihaia 8: 313. 1988.

毛萼地不容 *mao e di bu rong*

Pedicels puberulent. Sepals abaxially hispidulous; petals with tubercles inside. Fl. Jun.

• Shrublands at ditch sides. Yunnan (Nanjiang).

22. *Stephania lincangensis* H. S. Lo & M. Yang, Guihaia 8: 311. 1988.

临仓地不容 *lin cang di bu rong*

Herbaceous vines, glabrous except inflorescences. Roots tuberous, huge. Stems becoming black when dry. Petiole slightly longer than leaf blade; leaf blade oblate or subtriangular in outline, 5–7 × 5–7.5 cm, papery, abaxially dark gray, adaxially black, base subtruncate or slightly emarginate, occasionally cordate, margin usually dentate, apex usually mucronate, palmately 9–11-veined, conspicuous abaxially. Male inflorescences compound umbelliform cymes, axillary, seldom few on short axillary branches; peduncle slender, 2–6 cm; umbellet pedicel usually 3–5, slender, 0.8–1.5 cm, sometimes sparsely hispidulous; bracts and bracteoles linear, 1.5–2 mm, usually hispidulous. Male flowers: sepals 6, subelliptic, ca. 1.2 × 1 mm, margin involute when blooming; petals 3, ca. 0.7 × 1 mm, with 2 glands at base inside; synandrium shorter than petals. Female flowers and fruits unknown. Fl. Jun.

• Shrublands on sunny slopes. Yunnan (Lincang).

23. *Stephania kuinanensis* H. S. Lo & M. Yang, Bull. Bot. Res., Harbin 2(1): 46. 1982.

桂南地不容 *gui nan di bu rong*

Herbaceous vines, up to 3 m, glabrous. Stems and branches longitudinally striate. Petiole usually shorter than leaf blade, rarely slightly longer; leaf blade triangular-rotund, length and width 7–9(–10 or more) cm, papery, base subtruncate to slightly rounded, margin entire or occasionally sparsely dentate, apex mucronate, palmately 9- or 10-veined, fine reticulation very clear. Male inflorescences compound umbelliform cymes, axillary, solitary or few on short axillary branches with reduced leaves, slightly fleshy; peduncle slender, 1–4 cm; umbellet pedicels 6 or 7, ca. 1 cm; bracts linear. Male flowers (not fully mature): sepals light green, outer whorl 3, oblanceolate, ca. 1.5 × 0.6 mm, inner whorl obovate, ca. 1.5 × 0.9 mm; petals 3, fleshy, orangish yellow, broadly cuneate, ca. 0.8 mm wide, inside with 2 glands at base; synandrium ca. 1 mm, anthers 6 or 7. Young female inflorescences capitate. Female flowers unknown. Infructescences axillary; peduncle straight, 4–6.5 cm; umbellet pedicels 1 cm or shorter; fruiting pedicel straight, 2–3 mm, not fleshy. Drupes red, obovate; endocarp ca. 6.5 × 5.5 mm, with columnar tubercles apically obtuse.

• Wastelands. Guangxi (Longzhou).

The tuberous rootstock of *Stephania kuinanensis* is relatively small, less than 10 cm in diam., and contains the alkaloids L-dicentrine and rotundine.

24. *Stephania dicentrifera* H. S. Lo & M. Yang, Bull. Bot. Res., Harbin 2(1): 48. 1982.

荷包地不容 he bao di bu rong

Herbaceous and deciduous vines, ca. 3 m or longer. Stems and branches purplish brown when dry, longitudinally striate. Petiole subequal to or sometimes much longer than leaf blade; leaf blade triangular-rotund, length and width 8–15 cm, softly papery, black or grayish brown when dry, both surfaces glabrous, base subtruncate or rounded, margin entire to sparsely dentate, apex mucronate, sometimes obtuse with a finely mucronate acumen, palmately 10- or 11-veined, together with reticulation conspicuous on both surfaces, relatively more conspicuous abaxially. Inflorescences compound umbelliform cymes, usually axillary or sometimes on short axillary branches. Male peduncle 2.5–5 cm; umbellet pedicels 5–10, ca. 1(–2) cm; bracts linear-lanceolate. Male flowers: sepals 6 in 2 whorls, light yellow, outer whorl 3, oblanceolate to obovate, ca. 1.5 mm, inner whorl rhomboidal, 1.5–1.7 × 1.2–1.5 mm, base abruptly clawed below middle; petals 3, greenish yellow, broadly cuneate, ca. 0.7 × 0.8–1 mm, inside with 2 glands; synandrium ca. 0.7 mm, anthers usually 6. Female inflorescences with peduncle 3–7 cm; umbellet pedicels up to more than 10, 3–4 mm, fleshy, black when dry. Female flowers: sepal 1, minute; petals 2, broadly ovate-rounded, ca. 0.6 mm; carpel glabrous. Drupes with pedicel fleshy, red; endocarp broadly obovate, ca. 6 mm, with columnar tubercles apically swollen and capitate. Fl. Jun–Jul, fr. Sep–Oct.

- Stony places in forests. E and W Yunnan (Fengqing, Lincang).

The tuberous rootstock of *Stephania dicentrifera* contains large amounts of the alkaloid L-dicentrine and small amounts of rotundine.

An unpublished IUCN report listed this species as vulnerable: VU(A1c,2c;B2c).

25. *Stephania macrantha* H. S. Lo & M. Yang, Guihaia 8: 309. 1988.

大花地不容 da hua di bu rong

Herbaceous vines with huge tuberous roots, glabrous except for flowers. Branches ± brown when dry, longitudinally sulcate. Petiole 5–11 cm; leaf blade broadly ovate-rotund, 8–13 × 8–11 cm, subpapery, purplish brown when dry, base cordate or subtruncate, margin horned or horned dentate, apex mucronate or subacuminate, sometimes apiculate, palmately 9–11-veined, conspicuous on both surfaces. Male inflorescences compound umbelliform cymes, axillary; peduncle 2–4 cm; umbellet pedicels 4 or 5, 0.6–2 cm, usually without bract and bracteole, rarely with a linear bracteole on flowering pedicel; flowering pedicel 2–5 mm. Male flowers: sepals 6, subcuneate, with long claw ca. 3 × 1.5 mm, abaxially with transparent papillary hairs; petals 3, broadly cuneate, ca. 1.4 mm long and wide, with tuberculate processes inside; synandrium with a slender stipe ca. 0.7 mm. Female flowers and fruits unknown. Fl. May.

- Shrublands on limestone hills; ca. 1400 m. Yunnan (Biyang).

26. *Stephania officinarum* H. S. Lo & M. Yang, Guihaia 8: 310. 1988.

药用地不容 yao yong di bu rong

Herbaceous vines, glabrous. Roots tuberous, huge. Branches becoming purplish black, longitudinally striate. Petiole slightly longer or shorter than leaf blade, base geniculate; leaf blade peltate, insertion 3–4 cm from margin, rotund, 10–12.5 cm in diam., thinly papery, base rounded, apex rounded or inconspicuously mucronate, palmately 8–10-veined, often dichotomously branching, fine reticulation clearly seen abaxially. Male inflorescences compound umbelliform cymes, axillary, solitary or many on short axillary branches; peduncle slightly fleshy, slender when dry, 2–4(–5) cm; umbellet pedicel usually less than 1 cm, usually without bracts and bracteoles; flowering pedicels 4–6 mm. Male flowers: sepals 6, submembranous, outer whorl broadly elliptic, ca. 2 × 1.5 mm, base attenuate, inner whorl broadly rhomboidal, ca. 2.1 × 2.1 mm, both glabrous; petals 3, plump, fleshy, 0.8–1 × 1.8–2 mm, with verruculose processes; synandrium with short stipe, ca. equal to petal in height. Female inflorescences and flowers unknown. Drupes not mature, with fleshy stalk, broadly obovate. Fl. summer.

- Yunnan (Gengma, Lincang).

The tuberous rootstock of *Stephania officinarum* contains large amounts of the alkaloids isocorydine and 1-tetrahydropalmatine.

27. *Stephania dolichopoda* Diels in Engler, Pflanzenr. 46 (IV.94): 282. 1910.

大叶地不容 da ye di bu rong

Herbaceous vines. Branches stout, glabrous. Petiole 10–20 cm or slightly longer; leaf blade triangular-rotund, sometimes undulately lobed, length and width 10–19 cm or slightly larger, thinly papery, glabrous on both surfaces, base subtruncate, margin entire or undulate, apex obtuse to acutely acuminate, palmately 9–12-veined, reticulation slightly conspicuous. Inflorescences compound umbelliform cymes, axillary or on short axillary branches, slightly fleshy. Male peduncle 2–5 cm or longer; umbellet pedicels 5–7, 0.5–1.5 cm; cymelet pedicels pubescent. Male flowers: sepals 6, obovate-rhombic, 1.5–1.7 × 0.8–1.1 mm, base abruptly clawed below middle, apical margin involute, abaxially pubescent; petals 3, fleshy, broadly cuneate, ca. 0.7 mm, margin with sides thickened, imbricate, apex repand or inconspicuously 2-lobed; synandrium slightly shorter than or subequal to petals. Female inflorescences with peduncle 2–6(–12) cm; umbellet pedicel short. Female flowers: sepal 1, elliptic-ovate, ca. 1 mm or slightly longer; petals 2, rotund, ca. 0.7 mm. Drupes obovoid; endocarp 5–6 × 4–5 mm. Fl. summer, fr. autumn.

Forest margins, streamsides; 900–1100 m. SW Guangxi, S Yunnan [NE India].

28. *Stephania mshanica* H. S. Lo & B. N. Chang, Bull. Bot. Res., Harbin 2(1): 50. 1982.

马山地不容 ma shan di bu rong

Vines. Stems and branches relatively stout, longitudinally striate. Petiole usually shorter than leaf blade, rarely slightly longer; leaf blade triangular-rotund, 8–18 cm, length subequal to or slightly shorter than width, papery, base subtruncate,

rarely slightly rounded or emarginate, margin entire or repand dentate, sometimes horny, apex often mucronate, obtuse with a finely mucronate acumen, often palmately (9 or)10(or 11)-veined, relatively stout, fine reticulation brown abaxially when dry, very conspicuous. Inflorescences compound umbelliform cymes, axillary or on short axillary branches with reduced leaves, slightly fleshy. Male peduncle 3–8 cm; umbellet pedicel 5–8, 3–3.5 cm; bracts linear or occasionally foliaceous. Male flowers: sepals 6 in 2 whorls, yellowish green, narrowly elliptic to subanceolate, 1.9–2 × ca. 0.6 mm; petals orangish yellow, broadly cuneate, 0.6–0.7 mm, base thickened, imbricate, apex subtruncate or slightly repand; synandrium ca. 1 mm. Female inflorescences condensed to capitula; peduncle relatively stout; umbellet pedicel extremely short when blooming and slightly extended when fruiting. Female flowers: sepal 1, minute and scalelike; petals 2, orangish yellow, slightly large. Drupes red, broadly obovoid; endocarp 7.5–8 × ca. 6 mm, with columnar ornamentation, each row of 18–20. Fl. May, fr. Aug.

• Rock fissures on limestone mountains. Guangxi (Du'an, Mashan, Yishan).

The tuberous rootstock of *Stephania mashanica* is huge and contains a large amount of the alkaloid L-dicentrine.

An unpublished IUCN report listed this species as vulnerable: VU(A1c,2c;B2c).

29. *Stephania micrantha* H. S. Lo & M. Yang, Bull. Bot. Res., Harbin 2(1): 52. 1982.

小花地不容 xiao hua di bu rong

Herbaceous vines, glabrous. Stems and branches slender, longitudinally striate. Petiole slender, usually longer or much longer than leaf blade; leaf blade triangular-oblanceolate to rotund, repand or 3–5-lobed, 3.5–7.5 × 4–8 cm, papery, fine reticulation densely papuliferous, base subtruncate or emarginate, margin entire, apex obtusely rounded or abruptly acuminate, palmately 9- or 10-veined, slender. Male inflorescences compound umbelliform cymes, axillary or few on short branches twining and slightly fleshy; peduncle slightly slender, usually 1–2(–4) cm; umbellet pedicel 4–7, 0.3–1 cm; bracts linear; cymelets slightly dense. Male flowers: sepals 6 in 2 whorls, outer whorl oblanceolate, inner whorl obovate, 1.3–1.5 mm; petals 3, orangish yellow, conchiform, 0.6–1 mm, base slightly thickened, without gland, apex truncate or subtruncate; synandrium ca. 0.7 mm, anthers 6. Female inflorescences only seen in early stage, capitate; peduncle slightly stout, ca. 1 cm; umbellet pedicel and cymelets very short. Female flowers unknown. Drupes red, obovoid; endocarp 6–7 × 4–5 mm, with columnar ornamentation, each row of 20–25. Fl. Apr–May, fr. Jul.

• Limestone mountains. Guangxi (Longzhou).

30. *Stephania longipes* H. S. Lo, Bull. Bot. Res., Harbin 2(1): 54. 1982.

长柄地不容 chang bing di bu rong

Herbaceous and deciduous vines, glabrous. Branches and leaves containing red juice, light brown when dry; branchlets longitudinally striate. Petiole very long, rarely less than 2 × as long as leaf blade; leaf blade triangular-rotund, 9–15 × 8–14

cm, papery, dark green when dry, base subtruncate to slightly emarginate, margin horned- or repand dentate, apex acute, sometimes slightly obtuse and minutely cuspidate, rarely entire, palmately 10- or 11-veined, reticulation not raised but brown and conspicuous. Inflorescences compound umbelliform cymes, axillary. Male inflorescences slightly fleshy; peduncle 3–4 cm; umbellet pedicels 5–7, ca. 1.5 cm, very flattened, barred and transparent when dry; pedicel 3–5 mm. Male flowers: sepals 6–8, margin membranous and transparent, purplish brown near midrib when dry, cuneate, 1.2–1.5 mm; petals 3 or 4, slightly fleshy, broadly cuneate and slightly rounded, 0.8–1 mm, flat; synandrium with very short stalk or subsessile. Female inflorescences with peduncle 4–11 cm; umbellet pedicels 10–12, 8–15 mm; cymelet pedicel ca. 3 mm. Female flowers: sepal 1, minute; petals 2, minute; carpel glabrous. Infructescences with conspicuous umbellet pedicels slightly sparse; fruiting pedicels not fleshy. Drupes ?obovoid; endocarp 5–6 × 3.5–4 mm. Fl. Jun.

• Shrublands, rock fissures. SW Yunnan.

31. *Stephania dielsiana* Y. C. Wu, Bot. Jahrb. Syst. 71: 174. 1940.

血散薯 xue san shu

Herbaceous and deciduous vines, 2–3 m. Root tuberous, huge, exposed, brown, prominently lenticellate. Branches slightly stout, containing red juice, often purplish red, glabrous. Petiole subequal to or slightly longer than leaf blade; leaf blade triangular-rotund, 5–15 × 4.5–14 cm, papery, both surfaces glabrous, base slightly rounded to subtruncate, apex with mucronate acumen, palmately 8–10-veined, reticulation slender, purple. Inflorescences compound umbelliform cymes, axillary or on short axillary branches with reduced leaves. Male inflorescences with 1–3 orders of branching; cymelets with pedicels often many inserted at end of umbellet pedicel. Male flowers: sepals 6, with purple stripes, obovate to oblanceolate, ca. 1.5 mm, inner whorl slightly wider; petals 3, fleshy, often purple or slightly orange, conchiform, ca. 1.2 mm. Female inflorescences subcapitate; cymelets almost sessile. Female flowers: sepal 1; petals 2, smaller than in male. Drupes red, obovoid, rather flat, ca. 7 mm. Fl. early summer.

• Forests, forest margins, stony places at streamsides. Guangdong, Guangxi, S Guizhou, S Hunan.

32. *Stephania succifera* H. S. Lo & Y. Tsoong, Acta Phytotax. Sin. 16(1): 36. 1978.

小叶地不容 xiao ye di bu rong

Deciduous vines, 2–5 m, glabrous. Root tuberous, huge, exposed, brown and rough on surface, light brownish yellow inside. Branches and leaves containing red juice. Petiole usually 3–5(–8) cm; leaf blade rotund to triangular-rounded, length and width 5–9 cm, papery, densely papillate or adaxially inconspicuously papillate, base truncate or slightly emarginate, apex cuspidate, obtuse, with a finely mucronate acumen, palmately ca. 10-veined. Inflorescences compound umbelliform cymes, axillary or on short axillary branches with reduced or no leaves; peduncle 6–8 cm; umbellet pedicel 0.5–2 cm, slightly curved at end, with a few linear bracteoles; both cymelet pedicel and

flower pedicels very short. Male flowers: sepals 6 in 2 whorls, outer whorl oblanceolate-spatulate, ca. 1.2 mm, inner whorl broader, abaxially papillate; petals 3, purple, conchiform, with basal sides inflexed, slightly shorter than sepal; synandrium ca. 0.5 mm, anthers 6. Female inflorescences unknown. Female flowers unknown. Infructescences slightly dense compound umbelliform cymes; umbellet pedicel usually less than 1 cm. Endocarp obovoid, ca. 6×5 mm, with columnar ornamentation short, apically slightly curved and hooklike. Fl. Mar.

- Stony places in forests. Hainan.

33. *Stephania hainanensis* H. S. Lo & Y. Tsoong, Acta Phytotax. Sin. 16(1): 39. 1978.

海南地不容 hai nan di bu rong

Vines with old branches slightly woody. Branches and leaves containing pale yellow or white juice; branches stout, longitudinally sulcate, glabrous. Petiole stout, usually subequal to or slightly shorter than leaf blade; leaf blade triangular-rounded, length and width 10–16 cm, sometimes smaller, thinly papery, base rounded to subtruncate, margin repand or sparsely horned serrate, apex acutely acuminate or subentire, palmately 10- or 11-veined, with clear papilla on fine reticulation. Male inflorescences compound umbelliform cymes, often several on short axillary branches, leafless and twining; peduncle 3–7 cm; umbellet pedicels 3–5, 2–4.5 cm; cymelets 3–5-flowered; bracteoles narrowly lanceolate; pedicel 1–3 mm. Male flowers: sepals usually 6(or 8), yellowish green, outer whorl spatulate-cuneate, ca. 2.5 mm, inner whorl slightly wider; petals 3(or 4), orangish yellow, $1.5\text{--}2 \times 2\text{--}2.5$ mm, one deeply concave; synandrium columnar, ca. 1 mm. Female inflorescences condensed to capitula; peduncle 2.5–5 cm, conspicuously swollen apically. Female flowers zygomorphic; sepal 1, subovate, ca. 0.4 mm; petals 2, fleshy, broadly ovate to conchiform, slightly larger than sepals; fruiting pedicel slightly fleshy. Drupes red, broadly obovoid; endocarp ca. 1×0.8 mm, with columnar ornamentation conspicuously curved and hooklike. Fl. Mar–May.

- Hainan.

The tuberous rootstock of *Stephania hainanensis* contains a large amount of the alkaloid rotundine.

34. *Stephania kwangsiensis* H. S. Lo, Acta Phytotax. Sin. 16(1): 30. 1978.

广西地不容 guang xi di bu rong

Herbaceous and deciduous vines, sometimes with old stems slightly woody at base. Branches terete, longitudinally striate, glabrous, 2–3 mm in diam. Petiole 4–9 cm, twining at base; leaf blade triangular-rounded to rotund, length and width subequal, 5–12 cm or slightly longer, papery, abaxially greenish white, when dry becoming purplish red or sometimes purplish black, adaxially dark green when fresh, both surfaces glabrous, margin entire or horned serrate, palmately 10- or 11-veined, reticulation slightly conspicuous. Inflorescences compound umbelliform cymes, axillary. Male peduncle 2–7 cm; umbellet pedicels 6–10, 0.5–2 cm; cymelets many, cymosely condensed close to terminal of umbellet pedicel. Male flowers: sepals 6 in

2 whorls, light green, outer whorl spatulate-oblanceolate or obovate, $1.5\text{--}1.6 \times 0.4\text{--}0.6$ mm, inner whorl broadly ovate, 1.2–1.5 mm, abaxially densely papillate, with 2 large glands inside; synandrium 0.7–1 mm, anthers 4. Female inflorescences relatively stout; umbellet pedicel short, 3–4 mm. Female flowers: sepal 1(or 2), subovate, ca. 0.3 mm; petals 2(or 3), broadly ovate or broadly ovate-rounded, 0.4–0.8 mm; carpel glabrous. Drupes red; endocarp obovoid, $5\text{--}6 \times 4\text{--}5.5$ mm. Fl. May.

- Limestone mountains. Guangxi, SE Yunnan.

The tuberous roots contain a large amount of the alkaloid rotundine.

An unpublished IUCN report listed this species as vulnerable: VU(A1c,2c;B2c).

35. *Stephania excentrica* H. S. Lo, Acta Phytotax. Sin. 16(1): 33. 1978.

江南地不容 jiang nan di bu rong

Herbaceous and twining vines, glabrous. Roots tuberous, shortly clavate or fusiform. Branches brown, longitudinally striate. Petiole often very long, 7–10(–14) cm; leaf blade peltate, insertion 1–2 cm from margin, triangular or triangular-rotund, length and width 5–10(–13) cm, papery, base slightly emarginate or repand cordate, rarely subtruncate, margin entire, occasionally irregularly repand, apex obtuse, ?cuspidate, palmately 9- or 10-veined, reticulation thin and dense, becoming brown when dry. Male inflorescences axillary or on short axillary branches with reduced leaves; peduncle 2–5 cm, slightly fleshy, apex bracteolate; umbellet pedicel slender, 1–3 cm; cymelets with pedicels 5–8-fascicled at end of umbelliform pedicel. Male flowers: sepals 6 in 2 whorls, light green, free, broadly ovate or broadly rotund, ca. 1.2 mm; petals 3, broadly cuneate or conchiform, ca. $0.5 \times 0.7\text{--}0.9$ mm, with 2 large cushion-shaped glands inside; synandrium slightly longer than petals. Female inflorescences axillary and similar to male but umbellet pedicel relatively stout, less than 1 cm. Female flowers: sepal often 1, broadly ovate, ca. 1 mm; petals usually 2, rotund, ca. 0.5 mm in diam. Fruiting pedicel fleshy. Drupes red; endocarp rotund, ca. 6 mm in diam. Fl. Jun.

- Shrublands along forest margins or roads. W Fujian (Wuyi Shan), N and W Guangxi, Guizhou (Guiping), SW Hubei, NW Hunan, Jiangxi (Jinggangshan), C, E, and SE Sichuan.

36. *Stephania ebracteata* S. Y. Zhao & H. S. Lo, Guihaia 10: 181. 1990.

川南地不容 chuan nan di bu rong

Vines, 2–3 m or longer, glabrous. Roots tuberous, huge, grayish brown outside, densely tuberculate. Stems twining, yellowish green when dry, longitudinally striate, soft, hollow. Petiole usually much longer than lamina, 15–25 cm, swollen at both ends; leaf blade conspicuously peltate, triangular-rounded, $10\text{--}18 \times 9\text{--}18$ cm, papery, base truncate, rounded, or slightly cordate, margin entire or repand, rarely horned, apex obtuse, apiculate, palmately 9- or 10-veined. Male inflorescences axillary; peduncle 2–5 cm, without bracts or occasionally with a leafy bract; umbellet pedicels 4–7, 1–3 cm; cymelets with pedicels many, corymbosely arranged. Male flowers: sepals 5 or 6, con-

nate at base, light yellowish green, outer whorl obovate-elliptic, 1.7–2 × 1–1.2 mm, inner whorl broadly ovate, 1.8–2 × ca. 1.5 mm, base clawed, lobes auricled at each side; petals 3, fleshy, often conchiform, ca. 1.4 mm high, with 2 large glands inside; synandrium ca. 0.8 mm. Female flowers unknown. Infructescences with peduncle 2.5–6 cm, with fleshy pedicel. Drupes red, rotund, flattened, ca. 9 mm; endocarp obovate-rotund, ca. 7 × 6 mm. Fl. Aug–Sep.

- Ditch sides; ca. 2500 m. Sichuan (Miyi).

37. *Stephania miyiensis* S. Y. Zhao & H. S. Lo, *Guihaia* 10: 183. 1990.

米易地不容 mi yi di bu rong

Vines. Roots tuberous, fusiform or irregularly clavate, yellowish brown, with tuberculate lenticels. Stems twining, longitudinally striate, up to 1 cm thick at base, solid. Petiole 7–20

cm; leaf blade peltate, insertion 1.5–4 cm from margin, broadly rotund to triangular-rotund, length and width 7–18 cm, papery, base truncate, rounded, or slightly cordate, apex with finely mucronate acumen, palmately 10–12-veined. Male inflorescences composed of umbelliform cymes, axillary or sometimes on leafless old branches; peduncle 1.5–6 cm; umbellet pedicels 4–9; bracts filamentous; cymelets and flowers with pedicels. Male flowers: sepals 6 in 2 whorls, outer whorl ovate or obovate-lanceolate, 1.8–2.2 × 0.9–1.1 mm, inner whorl broadly rotund, 1.8–2.2 × 1.3–1.8 mm, base clawed, lobes auricled at each side; petals 3, fleshy, cuneate or broadly cuneate, ca. 1.2 × 1.8 mm, concave abaxially, with 2 large glands inside; synandrium ca. 1.6 mm. Female flowers unknown. Drupes with pedicel fleshy, red; endocarp rotund, 5–6.5 mm in diam.; condyle not perforate.

- Sichuan (Miyi).

18. *CISSAMPELOS* Linnaeus, Sp. Pl. 2: 1031. 1753.

锡生藤属 xi sheng teng shu

Vines or erect shrubs. Leaf blade ovate, cordate, or rotund, peltate or not, palmately veined. Male inflorescences axillary, corymbose cymes, sometimes borne along a reduced shoot arising from axils of bracteal leaves, pedunculate. Male flowers: sepals 4, obovate, often pubescent adaxially, extended outward when blooming; petals connate into cup-shaped corolla, rarely 2–4-divided almost to base; stamens 4(–10), connate into a peltate synandrium. Female inflorescences thyrsoid, elongate, composed of fascicles; bracts usually accrescent and foliaceous, overlapping. Female flowers: sepal 1; petal 1(–3), opposite to sepal; carpel 1, often pubescent. Drupes subglobose, slightly flattened, often pubescent, style scar near base; endocarp crustaceous or ± bony, horseshoe-shaped, abaxially bearing conical or transverse ridges; condyle usually subglobose. Seed horseshoe-shaped; embryo elongate, terete, embedded in endosperm; cotyledons flattened, shorter than or equal to radicle.

About 20–25 species: pantropical, mostly in Africa and America, few in Asia; one species in China.

1. *Cissampelos pareira* Linnaeus var. ***hirsuta*** (Buchanan-Hamilton ex Candolle) Forman, *Kew Bull.* 22: 356. 1968.

锡生藤 xi sheng teng

Cissampelos hirsuta Buchanan-Hamilton ex Candolle, *Syst. Nat.* 1: 535. 1817.

Woody vines. Branches slender, striate, usually densely pubescent, rarely subglabrous. Petioles shorter than leaf blade, often densely pubescent; leaf blade cordate-rotund or rotund, 2–5(–12) cm long and wide, papery, abaxially densely pubescent, adaxially sparsely pubescent, base often cordate, sometimes subtruncate, rarely slightly rounded, apex often emarginate, with a mucronate acumen, palmately 5–7-veined, slightly prominent abaxially. Male inflorescences axillary, solitary or

few fascicled, corymbose cymes, pubescent. Male flowers: sepals 1.2–1.5 mm, pilose outside; corolla cupuliform; synandrium ca. 0.7 mm. Female inflorescences thyrsoid, narrow, up to 18 cm, usually less than 10 cm; bracts foliaceous and suborbicular, overlapping along rachis, densely pubescent. Female flowers: sepals broadly obovate, ca. 1.5 mm; petals minute, ca. 0.7 mm. Drupes pubescent; endocarp broadly obovate, 3–5 mm, abaxially bearing 2 rows of transverse ridges on both surfaces of rib; condyle bordered by a horseshoe-shaped ridge.

Forests. NW Guangxi, SW Guizhou, S Yunnan [pantropical].

Cissampelos pareira var. *pareira*, with glabrous leaves, was described from the West Indies and seems to be restricted to that region, whereas var. *hirsuta* is pantropical.

19. *CYCLEA* Arnott ex Wight, Ill. Bot. 1: 22. 1840.

轮环藤属 lun huan teng shu

Paracyclea Kudô & Yamamoto.

Vines. Petiole usually long; leaf blade peltate, palmately veined. Inflorescences axillary, terminal or on old stems, thyrsoid, usually narrow, rarely broad and sparse; bracts small. Male flowers: sepals usually 4 or 5(or 6), usually connate, 4- or 5-lobed, rarely free; petals 4 or 5, usually connate, entire or 4–8-lobed, rarely free, sometimes absent; stamens 4 or 5, connate into a peltate synandrium, anthers dehiscing transversely. Female flowers: sepals and petals 1 or 2, opposite to each other, rarely absent; carpel 1, stigma short, 3- or many lobed. Drupes obovate-globose to rotund, often slightly flat, style scar near base; endocarp bony, horseshoe-shaped, abaxially bearing 2 or 3 rows of tubercles on both surfaces of rib; condyle usually 1 or 2 cavities, often perforate between style scar and base. Seed horseshoe-shaped; embryo terete, embedded in endosperm.

About 29 species: S and SE Asia; 13 species (five endemic) in China.

- 1a. Inflorescences cauliflorous or on leafless old branches, broad and large, many branched 13. *C. polypetala*
 1b. Inflorescences axillary on normal leafy shoots, narrow and few branched (except *C. barbata*).
 2a. Male inflorescences broad and large, many branched 1. *C. barbata*
 2b. Male inflorescences narrow, thyrsoid, few branched, sometimes spikelike.
 3a. Male flowers with sepals conspicuously connate.
 4a. Male sepals forming cup, lobes ca. as long as tube; leaves and branchlets hispid; petioles not peltately inserted 10. *C. meeboldii*
 4b. Male sepals not forming cup, lobes much shorter than tube; leaves and branchlets puberulent or subglabrous; petioles \pm peltately inserted.
 5a. Male sepals urceolate, pubescent 12. *C. tonkinensis*
 5b. Male sepals mitriform, glabrous.
 6a. Synandrium not exerted; male sepals 2.5–4 mm 5. *C. racemosa*
 6b. Synandrium exerted; male sepals ca. 2 mm or shorter 11. *C. debiliflora*
 3b. Male flowers with sepals free or only connate at base.
 7a. Rachis and drupes glabrous.
 8a. Endocarp ca. 7 mm 2. *C. sutchuenensis*
 8b. Endocarp less than 5.5 mm.
 9a. Endocarp subtruncate or slightly emarginate; leaves 2.5–7 \times 1.5–4 cm, glabrous or sparsely pilose, not papillate 3. *C. hypoglauca*
 9b. Endocarp tapered at base; leaves 6–12 \times 3–5.5 cm, abaxially densely setose or papillate 4. *C. wattii*
 7b. Rachis and drupes pubescent to hispid.
 10a. Leaf blade with margins coarsely 1- or 2-toothed 9. *C. ochiaiana*
 10b. Leaf blade with margins entire or sparsely serrate.
 11a. Female flowers with petals as long as sepals; male flowers with petal 1 or absent 8. *C. gracillima*
 11b. Female flowers with petals much smaller than sepals (female flowers unknown in *C. longgangensis*).
 12a. Male sepals mitriform, 2.5–4 mm 5. *C. racemosa*
 12b. Male sepals not mitriform.
 13a. Leaf margin long pubescent; male sepals oblong-elliptic 6. *C. longgangensis*
 13b. Leaf margin shortly puberulent; male sepals obovate or spatulate 7. *C. insularis*

1. *Cyclea barbata* Miers, Ann. Mag. Nat. Hist., ser. 3, 18: 19. 1866.

毛叶轮环藤 mao ye lun huan teng

Cyclea ciliata Craib; *C. wallichii* Diels.

Vines, herbaceous, to 5 m. Roots slightly fleshy, ?not tuberous. Young branches hispid. Petiole hispid, 1–5 cm; leaf blade conspicuously peltate, \pm broadly triangular-ovate, 4–10 \times 2.5–8 cm or more, papery or submembranous, abaxially puberulent to tomentose, margin densely hispid, adaxially hispid or sometimes subglabrous, base slightly emarginate or truncate, apex acutely acuminate or obtuse with a finely mucronate acumen, palmately 9- or 10(–12)-veined. Inflorescences axillary or cauliflorous. Male inflorescences paniculate, broad and large, 7–30 \times (0.5–)4–12 cm, puberulent, flowers condensed to capitate, interruptedly borne on branches. Male flowers: pedicels conspicuous; calyx cupular, 1.5–2 mm, hispid, lobes 4 or 5, ca. 1/2 length of tube; corolla cup-shaped (turbinate), ca. 0.7 mm, apex subtruncate; synandrium slightly exerted. Female inflorescences pendulous, narrowly racemelike paniculate. Female flowers sessile; sepals 2, slightly unequal, obovate to rhombic, ca. 0.4 mm, pilose on outer surface; petals 2, reniform, ca. 0.5 \times 1 mm, glabrous; ovary densely hispid, stigma 3-laciniate. Drupes red, obliquely obovate to rotund, puberulent; endocarp ca. 3 mm, abaxially bearing 3 rows of papillate tubercles, row bordering condyle not very conspicuous. Fl. autumn, fr. summer.

Forests, forest margins, shrublands at village margins. SW Guangdong, Hainan [NE India, Indonesia, Laos, Myanmar, Thailand, Vietnam].

This species is used medicinally.

2. *Cyclea sutchuenensis* Gagnepain, Bull. Soc. Bot. France 55: 37. 1908.

四川叶轮环藤 si chuan lun huan teng

Cyclea sutchuenensis var. *sessilis* Y. C. Wu; *Paracyclea sutchuenensis* (Gagnepain) Yamamoto; *P. sutchuenensis* var. *sessilis* (Y. C. Wu) Yamamoto.

Vines, herbaceous, slightly woody when old, glabrous except sometimes for pubescent bracts. Branchlets slender, striate. Petiole 2–6 cm; leaf blade peltate, insertion 1–5 mm from margin, lanceolate or ovate, 5–15 \times 2–5.5 cm, thinly leathery or papery, often brown when dry, base rounded, margin entire, apex acutely acuminate or caudate-acuminate, palmately 3–5-veined, prominent abaxially, reticulation slightly conspicuous. Inflorescences thyrsoid, sometimes spikelike, axillary, to 20 cm; rachis often twining, black when dry; peduncle short. Male inflorescences slender; bracts rhombic-ovate or rhombic-lanceolate, 1–1.5 mm or slightly longer, usually glabrous. Male flowers: sepals 4, connate only at base, slightly thick, elliptic or ovate-oblong, ca. 2.5 mm, apiculate; petals 4, usually connate, rarely free, 0.4–0.6 mm; synandrium ca. 1.5 mm, anthers 4. Female flowers: sepals 2, 1 rotund, margin involute, ca. 1.8 mm in diam., other conduplicate, 2–2.1 mm; petals 2, minute, less

than 1 mm, adnate to base of sepals; ovary glabrous. Drupes red; endocarp ca. 7 mm, abaxially bearing 3 rows of tubercles. Fl. summer, fr. autumn.

• Forests, forest margins, shrublands. N and W Guangdong, E and NE Guangxi, Guizhou, Hubei, S Hunan, E and SE Sichuan, NE and SE Yunnan.

3. *Cyclea hypoglauca* (Schauer) Diels in Engler, Pflanzenr. 46(IV.94): 319. 1910.

粉叶轮环藤 fen ye lun huan teng

Cissampelos hypoglauca Schauer, Nov. Actorum Acad. Caes. Leop.-Carol. Nat. Cur. 19(Suppl. 1): 479. 1843; *Cyclea deltoidea* Miers; *C. migoana* Yamamoto.

Vines, woody when old, glabrous except for hairy leaf axils. Branchlets slender. Petiole slender, 1.5–4 cm; leaf blade usually conspicuously peltate, ovate-triangular to ovate, 2.5–7 × 1.5–4.5 cm or slightly more, papery, both surfaces glabrous or sparsely whitish puberulent, base truncate to rounded, margin entire, slightly involute, apex acuminate, palmately 5–7-veined, slender, reticulation not very conspicuous. Inflorescences axillary. Male inflorescences scattered spicate; rachis unbranched or sometimes shortly branched at base, slender, glabrous; bracts small, lanceolate. Male flowers: sepals 4 or 5, free, obovate or obovate-cuneate, 1–1.2 mm; petals 4 or 5, usually connate, cup-shaped, rarely free, 0.5–1(–1.5) mm; synandrium slightly exerted, 1–1.2 mm. Female inflorescences thicker, thyrsoid; rachis conspicuously twining, up to 10 cm. Female flowers: sepals 2, rotund, ca. 0.8 mm in diam.; petals 2, unequal, large one ca. as long as sepals; ovary glabrous. Drupes red, glabrous; endocarp ca. 3.5 mm, subtruncate or slightly emarginate, abaxially bearing 3 rows of tubercles, row bordering condyle sometimes inconspicuous.

Forest margins, shrublands on hills. C and S Fujian, Guangdong, Guangxi, Guizhou, Hainan, S Hunan, C and S Jiangxi, SE Yunnan [N Vietnam].

4. *Cyclea wattii* Diels in Engler, Pflanzenr. 46(IV.94): 320. 1910.

西南轮环藤 xi nan lun huan teng

Paracyclea wattii (Diels) Yamamoto.

Vines, woody when old, 2–6 m. Old stems gray, irregularly and longitudinally fissured; branchlets slender, striate, glabrous or puberulent. Petiole slender, 3–5 cm or slightly longer, glabrous; leaf blade peltate or not, variously cordate, broadly ovate, or lanceolate, 6–12 × 3–5.5 cm or slightly longer, papery, slightly glaucous, abaxially densely setose or papillate, adaxially glabrous and glossy, base cordate, rounded, obtuse, or subtruncate, margin entire, apex long acuminate to mucronate. Inflorescences racemelike, axillary, composed of 1–3 cymelets; peduncle slender, 2–10 cm, glabrous; bracts 1–1.5(–2) mm, apex sparsely pubescent. Male flowers: sepals 5 or 6, lanceolate, oblong or elliptic, unequal, 1–1.5 × 0.3–0.7 mm; petals 3–6, unequal, rotund, broadly ovate or ligulate, 0.3–0.6 mm; synandrium 0.5–1 mm, anthers 4. Female flowers: sepals 2, black, obovate-oblong or oblanceolate-oblong, 1.5–2 mm; petals 2, ovate or broadly ovate, 0.5–0.7 mm, slightly fleshy;

ovary subglobose, stigma many lobed. Drupes obovate, glabrous; endocarp ca. 5.5 mm, tapered at base, abaxially bearing 2 or 3 rows of slightly projecting tubercles.

Forest margins, shrublands. Chongqing (Nanchuan), Guizhou (Anlong), Yunnan [NE India].

5. *Cyclea racemosa* Oliver, Hooker's Icon. Pl. 20: t. 1938. 1890.

轮环藤 lun huan teng

Cyclea racemosa f. *emeiensis* H. S. Lo & S. Y. Zhao.

Vines, woody when old. Branches slender, striate, puberulent or subglabrous. Petiole slender, shorter than or subequal to lamina, puberulent; leaf blade peltate or subpeltate, ovate-triangular or triangular-rotund, 4–9 × 3.5–8 cm or slightly longer, papery, abaxially usually densely puberulent and sometimes pilose, adaxially sparsely puberulent or subglabrous, base subtruncate to cordate, margin entire, apex mucronate to caudate-acuminate, palmately 9–11-veined, together with fine reticulation prominent abaxially. Inflorescences narrowly thyrsoid, densely flowered, 3–10 cm or longer; rachis slender, densely puberulent, branched part less than 1 cm; bracts ovate-lanceolate, ca. 2 mm, apex caudate-acuminate, puberulent abaxially. Male flowers: calyx mitriform, 4-lobed almost to base, 2 lobes broadly ovate, 2.5–4 × 2–2.5 mm, apex inflexed, 2 lobes sub-oblong, 1.8–2 mm wide, apex inflexed; corolla cup-shaped or shallowly cup-shaped, margin entire or 2–6-lobed almost to base; synandrium ca. 1.5 mm, anthers 4. Female flowers: sepals 1 or 2, base saccate, middle part contracted, 1.8–2.2 mm, apex slightly expanded and inflexed; petals 1 or 2, minute, often rotund, ca. 0.6 mm in diam.; ovary densely bristled, stigma 3-lobed. Drupes obovate, sparsely bristled; endocarp 3.5–4 mm in diam., abaxially bearing 3 rows of conical tubercles; condyle conspicuously globose. Fl. Apr–May, fr. Aug.

• Forests, forest margins, shrublands. Fujian, N Guangdong, C and N Guizhou, W Hubei, Hunan, Jiangxi, ?S Shanxi, C, E, and SE Sichuan, S Zhejiang.

The name *Cyclea racemosa* f. *emeiensis* (峨眉轮环藤 e mei lun huan teng) has been applied to material from around Emei Shan with glabrous mature leaves.

6. *Cyclea longgangensis* J. Y. Luo, Guihaia 9: 197. 1989.

弄岗轮环藤 long gang lun huan teng

Vines, woody. Branches striate, hispid. Petiole thick, 1.5–8 cm; leaf blade narrowly peltate, triangular-ovate, 3–12.6 × 2.7–12 cm, papery, abaxially grayish green, adaxially dark green and glossy, base slightly cordate to subtruncate, margin entire, ciliate, apex usually mucronate, palmately 7-veined, hispid along veins, reticulation conspicuous on both surfaces. Inflorescences racemose, composed of cymelets, axillary or cauliflorous. Male flowers: sepals 4, free, oblong-elliptic, 1.3–1.5 × 0.8–1 mm, apex obtuse; petals 4, free, slightly fleshy, ca. 0.2 mm, ca. as wide as long; synandrium ca. 0.8 mm. Female flowers unknown. Inflorescences 2–5.5 cm. Drupes obovate, ca. 4 mm in diam., with many tubercles; endocarp abaxially bearing 5 or 6 rows of sinuous rugae. Fl. May–Jun, fr. Oct–Nov.

• Guangxi (Longgang).

7. *Cyclea insularis* (Makino) Hatusima, Mem. Fac. Agric. Kagoshima Univ. 5(3): 29. 1966.

海岛轮环藤 hai dao lun huan teng

Cissampelos insularis Makino, Bot. Mag. (Tokyo) 24: 227. 1910; *Paracyclea insularis* (Makino) Kudô & Yamamoto.

Vines. Stems terete, sulcate, glabrous; branches longitudinally striate, retrorsely puberulent. Petiole usually shorter, rarely longer, than lamina, retrorsely puberulent; leaf blade peltate, triangular-cordate, 3–9 × 2.5–8 cm, papery, abaxially pubescent, adaxially puberulent, base shallowly cordate, truncate, or slightly protruding, margin entire or sparsely serrate, apex mucronate, with a mucronate acumen, palmately 5–7-veined, fine reticulation dense. Inflorescences axillary, 1–3 per axil, cymose or narrow, thyrsoid, and racemelike, usually shorter, rarely longer, than leaves; rachis appressed puberulent; branches very short, 2- to few flowered; bracts ovate-rhombic, sharply acuminate, puberulent abaxially. Male flowers: sepals 4 or 5, connate at base, obovate or spatulate, 0.6–1.3 × 0.6–1 mm, mucronate, pilose abaxially; petals 4(or 5), opposite to sepals, oblong to rotund, minute, sometimes absent, ca. 0.5 mm; synandrium ca. 1.5 mm, anthers 4. Female flowers: sepals 2, elliptic to rotund, base slightly thick and concave, ca. 1.5 mm, apex obtuse or slightly mucronate, puberulent abaxially; petal occasionally 1, minute; ovary saccate-obovoid, ca. 1 mm, glabrous or pubescent, stigma 3-lobed. Drupes obovate-rounded, ca. 5 mm in diam., glabrous or sparsely spreading pubescent; endocarp abaxially bearing 3 rows of tubercles. Fl. summer.

Forests. NW Guangxi, S Guizhou, Taiwan [Japan].

- 1a. Male flowers with 4(or 5) petals; inflorescences to 3 per axil, cymose, shorter than petiole 7a. subsp. *insularis*
 1b. Male flowers usually without petals; inflorescences solitary or paired, narrow, thyrsoid, and racemelike, up to as long as leaf, rarely longer 7b. subsp. *guangxiensis*

7a. *Cyclea insularis* subsp. *insularis*

海岛轮环藤(原亚种) hai dao lun huan teng (yuan ya zhong)

Inflorescences to 3 per axil, cymose with well-developed branches, shorter than petiole. Male flowers: petals 4 or 5.

Taiwan (Lan Yu) [Japan].

7b. *Cyclea insularis* subsp. *guangxiensis* H. S. Lo, Guihaia 6: 57. 1986.

黔贵轮环藤 qian gui lun huan teng

Inflorescences solitary or paired, narrow, thyrsoid, and racemelike, up to as long as leaf, rarely longer. Male flowers: petals usually absent. Fl. summer.

• Forests. NW Guangxi, S Guizhou.

8. *Cyclea gracillima* Diels in Engler, Pflanzenr. 46(IV.94): 319. 1910.

纤细轮环藤 xian xi lun huan teng

Cyclea densiflora (Yamamoto) Y. C. Tang & H. S. Lo; *Paracyclea densiflora* Yamamoto; *P. gracillima* (Diels) Yamamoto.

Vines, herbaceous. Young branches puberulent. Petiole shorter than lamina; leaf blade ± peltate, cordate-ovate to triangular-ovate, 2–8 × 1.5–5 cm, papery or membranous, abaxially tomentose, adaxially subglabrous, base deeply cordate to subtruncate, apex acuminate, usually palmately 5-veined. Male inflorescences solitary or 2- or 3-fascicled, paniculate or racemose, axillary, densely puberulent. Male flowers: sepals 5, connate at base, ovate to obovate, ca. 1 mm, base thickened, puberulent abaxially; petal 1, minute, rotund, sometimes absent; synandrium 1–1.2(–3) mm. Female inflorescences axillary, solitary, usually paniculate. Female flowers: sepal and petal each 1, broadly deltoid or broadly ovate, ca. 1 mm, hispid abaxially. Drupes red, subglobose, ca. 4 mm in diam., puberulent; endocarp abaxially bearing 3 rows of tubercles; condyle not perforate. Fl. Apr–Aug.

• Forests or shrublands at low altitudes. Hainan, Taiwan.

9. *Cyclea ochiaiana* (Yamamoto) S. F. Huang & T. C. Huang, Fl. Taiwan, ed. 2, 2: 594. 1996.

台湾轮环藤 tai wan lun huan teng

Cissampelos ochiaiana Yamamoto, Icon. Pl. Formosan., Suppl. 4: 14. 1928; *Paracyclea ochiaiana* (Yamamoto) Kudô & Yamamoto.

Vines. Branches terete, striate. Petiole slender, 0.5–5 cm, pilose; leaf blade narrowly peltate, triangular-ovate, 3–6.5 × 2.5–5 cm, abaxially densely tomentose, adaxially glabrous or pilose, base truncate to shallowly cordate, margin bluntly 1- or 2-toothed, apex acute, basal veins 5–7. Inflorescences axillary, solitary, narrowly paniculate, 4–8 cm, ± conical. Male flowers: pedicel ca. as long as sepals; sepals 4, outer ones broader, abaxially pubescent; petals apparently absent; synandrium shorter than sepals. Female flowers: pedicel shorter than sepals; sepals 2, oblong-ovate, recurved; ovary densely hairy. Drupes red, compressed globose, ca. 3 × 2 mm thick, hispid; endocarp abaxially bearing 2 rows of tubercles; condyle ?not perforate.

• Forest margins at low altitudes. Taiwan.

10. *Cyclea meeboldii* Diels in Engler, Pflanzenr. 46(IV.94): 315. 1910.

云南轮环藤 yun nan lun huan teng

Vines, to ca. 3 m. Branches striate, ferruginous hispid. Petiole 5–10 cm, hispid, striate, base geniculate; leaf blade not peltate, broadly cordate or cordate-rotund, 7–18 cm, papery, both surfaces hispid, abaxially densely so, apex acuminate or mucronate, palmately 5–7-veined, together with fine reticulation prominent abaxially. Inflorescences axillary, male inflorescence a narrow thyrsoid, racemose, ca. 8 cm, hispid, branches 1–1.5 cm. Male flowers: pedicels ca. 1.5 mm; sepals 4, connate, tube ca. 0.4 mm, lobes narrowly ovate, extending outward, ca. 0.8 mm, hispid abaxially; petals 4, free, broadly obovate, slightly fleshy, ca. 0.4 × 0.3 mm, glabrous; synandrium ca. 0.7 mm. Female flowers unknown. Infructescences shortly pedun-

culate or subsessile, 5–8 cm, hispid. Drupes obovate; endocarp ca. 4 mm, abaxially bearing 2 or 3 rows of tubercles.

Forests; 700–800 m. S and SW Yunnan [NE India].

11. *Cyclea debiliflora* Miers, Contr. Bot. 3: 242. 1871.

纤花轮环藤 xian hua lun huan teng

Vines. Branchlets striate, puberulent to subglabrous. Petiole 2–4 cm, glabrous; leaf blade triangular-ovate, 8–13 × 5–7.5 cm, papery, abaxially pale green and puberulent, adaxially dark green and subglabrous, base usually subtruncate or slightly rounded, apex acuminate, palmately 9(–11)-veined, prominent abaxially. Male inflorescences loosely paniculate, axillary, puberulent, branching filamentous, ultimate branching umbelliform; pedicels 1–1.5 mm, bracts ciliate. Male flowers: sepals mitriform, membranous, glabrous, ca. 2 mm; corolla cup-shaped, ca. 1.2 mm; synandrium conspicuously exerted, ca. 2.5 mm. Infructescences ca. 12 cm, sparsely pubescent. Endocarp 5–5.5 × 4–4.5 mm, abaxially bearing 3 rows of tubercles, base subtruncate.

Dry and sparse forests. Yunnan (Yingjiang) [NE India].

12. *Cyclea tonkinensis* Gagnepain, Bull. Soc. Bot. France 55: 38. 1908.

南轮环藤 nan lun huan teng

Vines, herbaceous or slightly woody. Branches slender, striate, puberulent. Petiole 1.5–6 cm, densely puberulent; leaf blade narrowly peltate, insertion close to margin, broadly triangular-ovate or cordate, 4–10 × 2–7 cm or slightly longer, papery, abaxially slightly pale, both surfaces puberulent or adaxially subglabrous, base cordate to subtruncate, apex long acuminate, palmately usually 10–12-veined, prominent abaxially. Inflorescences thyrsoid, often racemose, axillary, solitary

or didymous, narrow, slender, 6–12 cm; bracts puberulent. Male flowers: calyx inconspicuously 4-lobed, tube urceolate, black when dried, loosely pubescent, 1–2 mm; corolla cup-shaped or 2–4-parted almost to base, 0.3–0.5 mm; synandrium ca. 1.5 mm. Female flowers: sepals 2, saccate or deeply cucullate, 1.5–1.7 × ca. 0.5 mm, glabrous; petals 2, minute, broadly obdeltoid-cordate, ca. 0.4 mm, inserted at base of sepals; ovary glabrous. Drupes obovate, sparsely pubescent; endocarp ca. 3 × 3.5 mm, abaxially bearing 3 rows of tubercles. Fl. Sep–Nov, fr. Feb–Apr of following year.

Forests, shrublands. SW Guangxi, SE and SW Yunnan [Laos, N Vietnam].

13. *Cyclea polypetala* Dunn, J. Linn. Soc., Bot. 35: 485. 1903.

铁腾 tie teng

Vines, woody, to 10 m or longer. Branchlets longitudinally striate, hispid-puberulent. Petiole 3–7 cm, hispidulous, base geniculate; leaf blade sometimes narrowly peltate, broadly cordate, 6–18 × 5.5–15 cm, papery, abaxially hispid or puberulent, adaxially glabrous and glossy, margin entire, apex acuminate, palmately 5–7-veined, together with fine reticulation prominent abaxially. Inflorescences paniculate, cauliflorous, broad and large, up to 15 cm, hispid or puberulent; pedicel 0.7–1 mm. Male flowers: calyx suburceolate, apex subtruncate or with crenellated lobes, 1–2 mm; petals 4, free, oblong, ± fleshy, 0.5–1.5 mm; synandrium less than 2 mm. Female flowers: sepals 2, deeply cucullate, ca. 0.5 mm; petals 2, rotund, 0.1–0.3 mm in diam., adnate to base of sepals, margin involute. Drupes subglobose, slightly flattened, glabrous; endocarp ca. 4 mm, abaxially bearing 3 rows of tubercles. Fl. and fr. Apr–Nov.

Forests. S Guangxi (Longzhou), Hainan, SE and SW Yunnan [N and NE Thailand].