

VERBENACEAE

马鞭草科 ma bian cao ke

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Shrubs or trees, sometimes climbing shrubs, rarely herbs. Indumentum of simple, stellate, and/or other complex hairs. Leaves opposite or rarely whorled, without stipules, simple or 3-foliolate, less often palmately [or pinnately] compound. Inflorescences terminal or axillary, racemose, cymose, spicate, or thyrses. Flowers bisexual or polygamous by abortion, zygomorphic or rarely actinomorphic. Calyx persistent. Corolla 4- or 5- or more lobed; lobes usually spreading, aestivation overlapping. Fertile stamens inserted on corolla tube, alternate with lobes; filaments free; anthers dorsifixed, 1- or 2-locular, dehiscent by longitudinal slits or sometimes a circular pore. Ovary entire or 4-grooved, 2–8-locular; ovules 1 or 2 per locule, erect or pendulous. Style terminal, simple, entire or 2-cleft. Fruit a drupe or indehiscent capsule, sometimes breaking up into nutlets. Seeds (1 or) 2–4, endosperm usually absent, seed coat thin; embryo straight, as long as seed; radicle short, inferior.

Some 91 genera and ca. 2000 species: primarily tropical and subtropical, 20 genera and 182 species in China.

Chinese genera of economic importance include *Tectona* (timber), *Vitex* (gum, oil, tannin, timber), *Premna* and *Gmelina* (fine wood), *Callicarpa* and *Clerodendrum* (ornamental), *Callicarpa*, *Clerodendrum*, *Caryopteris*, *Premna*, etc. (medicinal).

Some species are only known in China as introduced ornamentals. Among these are *Vitex agnuscastus* Linnaeus and *Holmskioldia sanguinea* Retzius. According to H. Keng (pers. comm.), *Teijsmanniodendron coriaceum* (C. B. Clarke) Kostermans, a species characterized by indehiscent 1-seeded dry fruits, was collected near the Guangxi-Vietnam border and is expected to be found in China.

The classification of Verbenaceae is in a state of flux, especially regarding its relationship to Lamiaceae. There is evidence to suggest a significant division between members of subfamily Verbenoideae, genera 1–5 in this account, and the remaining genera, including genera 6–20, which for convenience are here referred to as subfamily Viticoideae s.l. The latter are more closely allied to each other and to genera traditionally kept within Lamiaceae (including genera 1–8 in this Flora). *Avicennia* is often placed in a family of its own, but its affinities are clearly with Viticoideae, especially genera 17–19 in this account which have traditionally been placed in a separate subfamily, Symphorematoideae.

P'ei Chien & Chen Shou-liang, eds. 1982. Verbenaceae. Fl. Reipubl. Popularis Sin. 65(1): 1–229.

- 1a. Inflorescences centripetal (lowermost flower or flower farthest from axis opening first), usually clearly racemose or spicate, sometimes condensed into capitula, always terminal; 1 or 2 stigma lobes prominently expanded (subfam. Verbenoideae).
 - 2a. Inflorescences dense capitula or short spikes, with overlapping bracts, rachis obscure.
 - 3a. Shrubs, sometimes climbing; fruit a drupe; flowers red, orange, or yellow; stem spiny 2. *Lantana*
 - 3b. Herbs, creeping and rooting at nodes; fruit a capsule; flowers purple; stem not spiny 3. *Phyla*
 - 2b. Inflorescences elongated spikes or racemes, without overlapping bracts, rachis easily visible.
 - 4a. Stamens 2; rachis excavated; fruit splitting into 2 1-seeded cocci 4. *Stachytarpheta*
 - 4b. Stamens 4; rachis not excavated; fruit splitting into pyrenes.
 - 5a. Shrubs, often climbing; ovary 8-locular; fruit fleshy; pyrenes 2-seeded; flowers pedicellate 1. *Duranta*
 - 5b. Annual or weakly perennial herbs; ovary 4-locular; fruit dry; pyrenes 1-seeded; flowers sessile 5. *Verbena*
- 1b. Inflorescences centrifugal (uppermost flower or flower closest to axis opening first), usually clearly cymose, sometimes grouped into elongated thyrses or reduced to axillary flowers or clusters of flowers; stigma lobes usually linear to tongue-shaped (capitate in *Callicarpa*) (subfam. Viticoideae).
 - 6a. Mangrove trees, growing along sea coast in tidal mud 20. *Avicennia*
 - 6b. Lianas, shrubs, herbs, or trees, growing inland or on sandy beaches at sea coast.
 - 7a. Inflorescences capitate, with conspicuous oblanceolate to spatulate involucre bracts; ovules apical, orthotropous.
 - 8a. Involucre 3- or 4-lobed, lobes usually joined at base; corolla 2-lipped; stamens 4 19. *Congea*
 - 8b. Involucre (5- or) 6-lobed, lobes free; corolla not 2-lipped; stamens 5 or more.
 - 9a. Corolla actinomorphic, 6-16(-18)-lobed; stamens 6-16(-18); leaf blade margin often \pm dentate 17. *Symphorema*
 - 9b. Corolla actinomorphic or slightly zygomorphic, 5(-7)-lobed; stamens 5(-7); leaf blade margin entire 18. *Sphenodesme*
 - 7b. Inflorescences mostly lax, rarely capitate, always without clearly defined involucre bracts; ovules basal, anatropous.
 - 10a. Fruit dry, usually a schizocarp, sometimes deeply lobed.
 - 11a. Fruiting calyx conspicuously accrescent, translucently membranous; corolla 4-lobed 7. *Hymenopyramis*
 - 11b. Fruiting calyx slightly enlarged; corolla usually 5-lobed.
 - 12a. Stems strongly 4-winged; leaves soon falling, leaf blade much shorter than internodes; calyx divided to near base 16. *Schnabelia*
 - 12b. Stems terete or 4-angled, not winged; leaves persistent, leaf blade at least as long as most internodes; calyx tube as long as or longer than lobes.
 - 13a. Leaves simple; calyx (4- or) 5- (or) 6-dentate or lobed; flowers 6–15 mm 15. *Caryopteris*
 - 13b. Leaves simple or 3-lobed; calyx minutely dentate to subtruncate; flowers ca. 4 mm 13. *Garrettia*
 - 10b. Fruit a fleshy drupe, often lobed, with separate pyrenes.
 - 14a. Corolla actinomorphic; stamens 4–6, subequal.

- 15a. Flower bud conspicuously swollen at tip; stamens fewer than corolla lobes; leaf hairs simple 14. *Clerodendrum*
- 15b. Flower bud not swollen at tip; stamens as many as corolla lobes; leaf hairs often branched or stellate, rarely all simple.
- 16a. Inflorescences axillary cymes; fruiting calyx unaltered, tube always shorter than fruit 6. *Callicarpa*
- 16b. Inflorescences large terminal panicles; fruiting calyx very elongated, inclosing fruit 8. *Tectona*
- 14b. Corolla zygomorphic or slightly oblique; stamens 4, didynamous.
- 17a. Flower bud conspicuously swollen at tip; drupes with 4 1-seeded pyrenes, sometimes separating into 4 1-locular nutlets 14. *Clerodendrum*
- 17b. Flower buds not swollen at tip; drupes with 1 pyrene, normally 4-locular, 4-seeded or (by abortion) 3- or 2-seeded.
- 18a. Leaves palmately compound (except *V. rotundifolia* and *V. trifolia* var. *subtrisetia*) 11. *Vitex*
- 18b. Leaves simple (occasionally some 3-foliolate in *Tsoongia*).
- 19a. Leaf blade abaxially gray mealy, often with large gland patches especially near base; corolla 2–5 cm, ventricose or funnelliform; stigma lobes very unequal 12. *Gmelina*
- 19b. Leaf blade abaxially green or if gray or white then with dense simple hairs, without gland patches; corolla to 1 cm, tubular; stigma lobes (where known) equal.
- 20a. Inflorescences terminal cymes, panicles, or thyrses, sometimes racemelike or spikelike; calyx usually not 2-lipped but if 2-lipped then upper lip usually emarginate or dentate and if lower lip entire then upper lip also entire 9. *Premna*
- 20b. Inflorescences axillary, few flowered lax cymes; calyx obscurely 2-lipped with lower lip 2-lobed, upper lip entire 10. *Tsoongia*

1. DURANTA Linnaeus, Sp. Pl. 2: 637. 1753.

假连翘属 *jia lian qiao shu*

Shrubs. Leaves opposite or whorled, simple, margin entire or serrate-dentate. Inflorescences axillary or terminal racemes; bracts small. Calyx 5-veined, 5-dentate, persistent. Corolla 2-lipped, lower lip 3-lobed and largest, upper lip 2-lobed. Stamens 4, short, inserted above middle of cylindrical corolla tube, obscurely didynamous. Ovary 8-locular; ovules 1 per locule, pendulous. Style club-shaped; stigma nearly oblique. Drupes equaling or shorter than calyx, with 2-seeded pyrenes.

About 30 species: tropical America, one species introduced to China and sometimes naturalized.

1. *Duranta erecta* Linnaeus, Sp. Pl. 2: 637. 1753.

假连翘 *jia lian qiao*

Duranta repens Linnaeus.

Shrubs, often climbing. Branches spiny, pubescent when young. Petiole ca. 1 cm, pubescent; leaf blade ovate to lanceolate, 2–6.5 × 1.5–3.5 cm, papery, base cuneate, margin entire to distally crenate, veins 6 pairs. Calyx pubescent on

both surfaces. Corolla tube ca. 7 mm. Stamens included. Ovary glabrous. Drupes ca. 5 mm in diam., shorter than calyx, shiny, glabrous. Fl. and fr. May–Oct. $2n = 36$.

Usually cultivated or sometimes naturalized near farm houses; 200–400 m. Naturalized in Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Taiwan, Zhejiang [North and South America].

Medicinal, ornamental.

2. LANTANA Linnaeus, Sp. Pl. 2: 626. 1753.

马缨丹属 *ma ying dan shu*

Shrubs, climbing, aromatic, pubescent or glabrous. Branches 4-angled, sometimes prickly. Leaves petiolate; leaf blade simple, crenate, often rugose. Inflorescences dense capitula, pedunculate; bracts exceeding calyx. Calyx small, membranous, truncate or sinuate dentate. Corolla nearly actinomorphic or slightly 2-lipped, tube slender; lobes 4 or 5, spreading. Stamens 4, didynamous, included. Ovary 2-locular. Style shorter than corolla tube; stigma obliquely subcapitate. Drupes with 2 1-seeded pyrenes.

About 150 species: tropical and subtropical America, one species naturalized in China.

Additional species grown as ornamentals.

1. *Lantana camara* Linnaeus, Sp. Pl. 2: 627. 1753.

马缨丹 *ma ying dan*

Shrubs with long weak branches, armed with stout recurved prickles, pubescent. Petiole 1–2 cm, pubescent; leaf blade ovate to oblong, 3–8.5 × 1.5–5 cm, papery, wrinkled, very rough, with short stiff hairs, aromatic when crushed, base rounded to subcordate, margin crenate; lateral veins 5 pairs, very prominent, elevated. Capitula terminal, 1.5–2.5 cm across. Flowers yellow or orange, often turning deep red soon after

opening. Ovary glabrous. Drupes deep purple, globose, ca. 4 mm in diam. $2n = 44$.

Open waste places and near coast; 100–1500 m. Naturalized in Fujian, Guangdong, Guangxi, Hainan, Taiwan [tropical and subtropical America, often naturalized in other tropical and subtropical regions].

Medicinal, ornamental.

A very wide range of flower colors has been developed within cultivars.

3. PHYLA Loureiro, Fl. Cochinch. 1: 66. 1790.

过江藤属 guo jiang teng shu

Herbs. Branches usually acutely 4-angled, sometimes spiny, hirsute, glandular. Leaves opposite. Inflorescences terminal, spicate or capitate, elongated in fruit; bracts obovate. Flowers small. Calyx membranous, 2-lipped, 4-lobed. Corolla sometimes 2-lipped; lobes 5, spreading. Stamens 4, didynamous, inserted on distal part of corolla tube, included. Ovary 2-locular; ovule 1 per locule. Style short; stigma capitate. Capsules small, splitting into 2 1-seeded cocci.

About ten species: Africa, America, and Asia; one species in China.

Phyla has often been combined with *Lippia* but differs in characters such as herbaceous habit, elongated infructescences, and obovate bracts.

1. **Phyla nodiflora** (Linnaeus) E. L. Greene, Pittonia 4: 46. 1899.

过江藤 guo jiang teng

Verbena nodiflora Linnaeus, Sp. Pl. 1: 20. 1753; *Lippia nodiflora* (Linnaeus) Michaux.

Herbs, perennial. Branches many, creeping, rooting at distal nodes, minutely strigose. Leaves subsessile; leaf blade spatulate, 1–3 × 0.5–1.5 cm, papery, pubescent, base cuneate, margin distally sharply serrate, veins inconspicuously 4-paired.

Inflorescences cylindrical to ovate capitula, 1–2.5 cm; peduncle 1–7 cm. Corolla pinkish purple or white, glabrous. Capsules ca. 1.5 mm in diam. $2n = 36$.

Common weed along stream banks and in grassy places; 300–2300 m. Fujian, Guangdong, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Xizang, Yunnan [tropics and subtropics of both hemispheres].

Medicinal.

4. STACHYTARPHETA Vahl, Enum. Pl. 1: 205. 1804, nom. cons.

假马鞭属 jia ma bian shu

Herbs or shrubs. Branches usually forked, hairy. Leaves opposite, petiolate, simple; leaf blade dentate or crenate, often rugose. Spikes terminal, usually long, lax; rachis often angular, excavated. Flowers ± immersed in excavated rachis when young. Calyx membranous, 4- or 5-dentate, becoming variously slit. Corolla slender, cylindrical; tube often curved, ± villous in throat; lobes 5, spreading. Stamens 2, fertile, inserted on distal part of corolla tube; anthers divaricate. Ovary supported by a short ringlike disc, 2-locular; ovules 2 per locule. Stigma capitate. Capsules splitting into 2 1-seeded cocci.

About 65 species: tropical America, a few species introduced in the Old World; one species a naturalized weed in China.

1. **Stachytarpheta jamaicensis** (Linnaeus) Vahl, Enum. Pl. 1: 206. 1804.

假马鞭 jia ma bian

Verbena jamaicensis Linnaeus, Sp. Pl. 1: 19. 1753.

Subshrubs or robust perennial herbs, 0.6–2 m tall. Branches 4-angled when young, sparsely pubescent to subglabrous. Petiole winged; leaf blade elliptic to oblong-ovate, 2.4–8 × 4.5 cm, papery, subglabrous, base elongated, margin

serrate, apex acuminate, veins 5 or 6 pairs. Spikes few to 20 cm or longer; bracts ca. 5 mm, membranous. Calyx ca. 6 mm, glabrous. Corolla dark blue; tube 7–12 mm, slightly curved. Capsules included in calyx.

Shaded grassy places in valleys; 300–600 m. Naturalized weed in Fujian, Guangdong, Guangxi, Hainan, Taiwan, Yunnan [tropical America, naturalized throughout tropics].

Medicinal.

5. VERBENA Linnaeus, Sp. Pl. 1: 18. 1753.

马鞭草属 ma bian cao shu

Herbs or subshrubs, annual or perennial. Branches 4-veined. Leaves opposite, sessile, dentate, lobed, or pinnatifid. Spikes usually terminal, simple or branched; bracts small. Flowers alternate, nearly zygomorphic. Calyx membranous, 5-dentate. Corolla with a distinct tube; lobes 5, unequal, spreading. Stamens 4, fertile, didynamous, inserted at middle of corolla tube, included; anthers ovate. Ovary 4-locular; ovules erect, 1 per locule. Capsules dry, included in calyx, dehiscent into 4 1-seeded pyrenes.

About 250 species: chiefly in tropical America, one species in China.

Additional species grown as ornamentals.

1. **Verbena officinalis** Linnaeus, Sp. Pl. 1: 20. 1753.

马鞭草 ma bian cao

Herbs, annual or weakly perennial, erect, 30–140 cm tall, pubescent to subglabrous. Leaves narrowed into a petiole 0.3–4 cm; leaf blade ovate, obovate, or oblong, 2–8 × 1–5 cm, papery, hirsute especially on abaxial veins, margin coarsely dentate or cut to sometimes deeply pinnatifid or lobed. Spikes

long, slender; bracts as long as calyx. Calyx 1–4 mm, pubescent, glandular. Corolla blue to pink, (2–)4–8 mm, pubescent. Ovary glabrous. Nutlets oblong, ca. 2 mm. Fl. and fr. Jul–Oct. $2n = 14$.

Grassy places on mountain slopes; 100–1800 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shanxi, Sichuan, Taiwan, Xinjiang, Xizang, Yunnan, Zhejiang [worldwide weed in temperate zones and tropics].

6. CALLICARPA Linnaeus, Sp. Pl. 1: 111. 1753.

紫珠属 *zi zhu shu*

Shrubs or trees, erect or rarely climbing; hairs stellate, verticillately branched, dendritic, mealy tomentose, or rarely simple and hooked. Branchlets terete or 4-angled. Leaves opposite or in 3s. Cymes axillary, sessile or pedunculate; bracts linear. Calyx campanulate, truncate or minutely 4-dentate, unaltered in fruit. Corolla actinomorphic, campanulate or tubular, lobes 4. Stamens 4, inserted on corolla tube; filaments slender, often exerted; anthers ovate or oblong, dehiscing by longitudinal slits or circular pores. Ovary imperfectly 2-locular; ovules 2 per locule, attached to middle or distal part of ovary. Style usually longer than stamens; stigma usually dilated. Fruit a small globose drupe, endocarp bony, mesocarp fleshy, exocarp thin. Seeds small, oblong; seed coat membranous; cotyledons fleshy.

About 140 species: mainly in tropical and subtropical Asia, few in tropical America and Africa, and very few in temperate Asia and North America; 48 species in China.

- 1a. Plants glabrous except stems with short strongly antrorsely curved hairs 48. *C. peichieniana*
- 1b. Plants with stellate, whorled, dendritic, or erect simple hairs.
 - 2a. Calyx tubular, longer than fruit, deeply dentate 1. *C. kochiana*
 - 2b. Calyx cup-shaped or campanulate, shorter than fruit, truncate, subtruncate, or short dentate.
 - 3a. Filaments shorter than corolla, rarely equaling or longer than corolla; anthers oblong, opening by an apical pore.
 - 4a. Leaves and flowers densely red or dark red glandular.
 - 5a. Leaf blade abaxially with stellate hairs along veins; calyx subglabrous; corolla white; filaments shorter than corolla tube 36. *C. dentosa*
 - 5b. Leaf blade abaxially subglabrous; calyx with stellate hairs; corolla purple; filaments equal to corolla tube or slightly exerted 35. *C. cathayana*
 - 4b. Leaves and flowers yellow glandular or eglandular.
 - 6a. Leaf blade abaxially pubescent with stellate hairs.
 - 7a. Corolla ca. 3 mm 37. *C. collina*
 - 7b. Corolla more than 3 mm.
 - 8a. Calyces, corollas, and ovaries pubescent; fruit pubescent at maturity; leaf blade abaxially with only stellate hairs 38. *C. tingwuensis*
 - 8b. Calyces, corollas, and ovaries glabrous or subglabrous; fruit glabrous at maturity; leaf blade abaxially pubescent to sparsely pubescent along midvein only, with some hairs simple.
 - 9a. Leaf blade margin serrate; calyx teeth obtusely triangular 39. *C. randaiensis*
 - 9b. Leaf blade margin subentire to sparsely serrulate towards apex; calyx teeth minute or absent 40. *C. brevipes*
 - 6b. Leaf blade abaxially glabrous or subglabrous.
 - 10a. Cymes 2- or 3-flowered; fruiting pedicel more than 4 mm 47. *C. oligantha*
 - 10b. Cymes more than 3-flowered; fruiting pedicel 1–3 mm.
 - 11a. Leaf blade base subcordate; petiole very short to leaf subsessile 46. *C. lingii*
 - 11b. Leaf blade base cuneate or obtuse; petiole 0.5–1.5 cm.
 - 12a. Leaf blade subleathery; peduncle ca. 2 × or more as long as petioles 41. *C. remotiserrulata*
 - 12b. Leaf blade papery or membranous, rarely subleathery; peduncle shorter to slightly longer than petioles.
 - 13a. Leaf blade membranous, adaxially pubescent 45. *C. anisophylla*
 - 13b. Leaf blade papery or rarely subleathery, adaxially glabrous.
 - 14a. Petiole less than 5 mm; cymes many flowered; fruit ca. 3 mm in diam. 44. *C. kwangtungensis*
 - 14b. Petiole 6–20 mm; cymes few flowered; fruit ca. 2.5 mm in diam.
 - 15a. Leaf blade obovate, ovate, or elliptic; peduncle 6–10 mm; calyx obtusely triangular 42. *C. japonica*
 - 15b. Leaf blade oblanceolate to lanceolate; peduncle less than 6 mm; calyx subtruncate 43. *C. membranacea*
 - 3b. Filaments usually 2 × or more as long as corolla (except in *C. pauciflora*); anthers rounded, ovate, or elliptic, opening by longitudinal slits.
 - 16a. Peduncle robust, usually over 3 cm (except *C. hypoleucophylla*, *C. macrophylla*, and *C. minutiflora*).
 - 17a. Leaf blade margin entire; trees or climbing shrubs.
 - 18a. Climbing shrubs; peduncle terete; uppermost leaves very reduced so that cymes form a terminal panicle 4. *C. integerrima*
 - 18b. Erect trees; peduncle 4-angled; uppermost leaves not or only slightly reduced so that cymes are clearly axillary.
 - 19a. Leaf blade leathery, without glands; pedicel ca. 1.5 mm 2. *C. arborea*
 - 19b. Leaf blade papery, red-brown glandular; pedicel ca. 3 mm 3. *C. yunnanensis*
 - 17b. Leaf blade margin serrulate or serrate (sometimes undulate or subentire in *C. nudiflora*); shrubs or rarely small trees.
 - 20a. Leaf blade without glands.

- 21a. Ovary puberulent; peduncle 2–3 cm 7. *C. macrophylla*
 21b. Ovary glabrous; peduncle 3–8 cm.
 22a. Calyx and corolla pubescent; calyx teeth ca. 1 mm; bracts lanceolate, 3–4 × 1 cm 5. *C. longibracteata*
 22b. Calyx and corolla glabrous; calyx truncate or minutely 4-dentate; bracts lanceolate-linear, smaller 6. *C. nudiflora*
- 20b. Leaf blade yellow glandular.
 23a. Calyx outside glabrous 8. *C. acutifolia*
 23b. Calyx outside densely stellate pubescent.
 24a. Corolla 2–2.5 mm; leaf blade elliptic, abaxially yellowish green 10. *C. minutiflora*
 24b. Corolla ca. 1.5 cm; leaf blade lanceolate to lanceolate-oblong, abaxially gray to whitish 11. *C. hypoleucophylla*
- 16b. Peduncle slender, less than 3 cm.
 25a. Leaf blade base cordate to truncate.
 26a. Stems covered with predominantly long simple hairs; calyx teeth 1–2 mm; petiole 5–8 mm 32. *C. longipes*
 26b. Stems densely covered with stellate hairs; calyx teeth less than 0.5 mm; leaves sessile or very short petiolate.
 27a. Leaf blade margin very shallowly crenulate; calyx teeth obsolete; corolla white, very minutely papillate 33. *C. basitruncata*
 27b. Leaf blade margin serrate; calyx teeth acute; corolla reddish, pilose 34. *C. rubella*
- 25b. Leaf blade base cuneate, obtuse, or rounded.
 28a. Leaf blade woolly-velvety, tomentose, or silky on both surfaces but especially abaxially.
 29a. Calyx dentate, teeth 0.3–1 mm; branchlets densely covered with yellow-brown dendritic hairs 9. *C. loboapiculata*
 29b. Calyx truncate or minutely dentate, teeth less than 0.3 mm; branchlets short velvety.
 30a. Leaf blade abaxially with silky hairs; branchlet nodes with a transverse scar 14. *C. poilanei*
 30b. Leaf blade abaxially with stellate velvety hairs; branchlet nodes without a transverse scar.
 31a. Leaf blade 8–20 × 4–8 cm, margin densely serrate; cymes many flowered; calyx densely velvety 12. *C. candicans*
 31b. Leaf blade 3–6 × 2–3 cm, margin sparsely serrulate or entire; cymes few flowered; calyx sparsely pilose 13. *C. gracilipes*
- 28b. Leaf blade abaxially sparsely hairy with stellate or simple hairs or sometimes glabrous.
 32a. Leaves and flowers usually with red, dark red, or dark purple glands.
 33a. Leaf blade abaxially with uniformly stellate hairs to subglabrous 28. *C. bodinieri*
 33b. Leaf blade abaxially glabrous or with sparse stellate pubescence only along midvein.
 34a. Leaf blade narrowly lanceolate to lanceolate, base broadly cuneate to subrounded, abaxially dark purple glandular 29. *C. salicifolia*
 34b. Leaf blade oblong-lanceolate, elliptic-lanceolate, or ovate-oblong, base cuneate, abaxially red-brown glandular.
 35a. Cymes ca. 1 cm across; fruit ca. 2 mm in diam.; fruiting calyx not thick 30. *C. erythrostickta*
 35b. Cymes ca. 2 cm across; fruit ca. 3 mm in diam.; fruiting calyx thick 31. *C. hungtaii*
- 32b. Leaves and flowers usually with yellow glands.
 36a. Branchlets, leaf abaxial surfaces, and cymes with yellow-brown simple hairs 27. *C. pilosissima*
 36b. Branchlets, leaf abaxial surfaces, and cymes with stellate or branched hairs or glabrous.
 37a. Calyx pubescent; leaf blade abaxially with stellate hairs.
 38a. Calyx truncate to minutely dentate; fruit stellate pubescent when mature; branchlets 4-angled, nodes with a transverse scar 19. *C. longifolia*
 38b. Calyx teeth triangular, less than 1.5 mm; fruit glabrous when mature; branchlets terete, nodes without a transverse scar.
 39a. Ovary glabrous; peduncle longer than petioles.
 40a. Petiole 5–25 mm; leaf blade adaxially minutely hispid and scabrous, base obtuse to rounded; cymes many flowered; peduncle 1.5–2.5 cm; corolla glabrous 15. *C. formosana*
 40b. Petiole 3–5 mm; leaf blade adaxially sparsely pilose, base cuneate to broadly cuneate; cymes few flowered; peduncle 0.8–1 cm; corolla puberulent 16. *C. pseudorubella*
 39b. Ovary pubescent; peduncle shorter than or equal to petioles.
 41a. Calyx teeth 1–1.5 mm 17. *C. pauciflora*
 41b. Calyx teeth less than 0.5 mm 18. *C. giraldii*
- 37b. Calyx usually glabrous; leaf blade abaxially glabrous or sparsely stellate pubescent only on veins.
 42a. Cymes with leafy branchlets growing out from them.

- 43a. Leaf blade lanceolate, oblong-lanceolate, or ovate, margin slightly sinuate, serrate, serrulate, or entire; corolla tube ca. 2 mm 20. *C. prolifera*
- 43b. Leaf blade elliptic to oblong-elliptic, margin distinctly triangular-serrulate; corolla tube ca. 4 mm 21. *C. pingshanensis*
- 42b. Cymes without leafy branchlets growing out from them.
- 44a. Branchlets 4-angled, with sparse simple hairs, nodes with a ring of hairs or transverse scar 22. *C. longissima*
- 44b. Branchlets terete, with stellate hairs or subglabrous, nodes without a ring of hairs or transverse scar.
- 45a. Peduncle 4–7 mm, shorter than petioles; fruit ca. 1 mm in diam. 23. *C. luteopunctata*
- 45b. Peduncle 8–20 mm, longer than petioles; fruit 1–4 mm in diam.
- 46a. Leaf blade 2–6(–10) cm, obovate to lanceolate, margin apically coarsely dentate 24. *C. dichotoma*
- 46b. Leaf blade 10–15 cm, elliptic-lanceolate, elliptic, or ovate-elliptic, margin serrate to subentire.
- 47a. Petiole less than 1 cm; leaf blade abaxially stellate tomentose on veins, margin serrate; peduncle 2 × as long as petioles 25. *C. kotoensis*
- 47b. Petiole 1.5–2 cm; leaf blade abaxially glabrous, margin subserrate to subentire; peduncle as long as petioles 26. *C. siongsaiensis*

1. *Callicarpa kochiana* Makino, Bot. Mag. (Tokyo) 28: 181. 1914.

枇杷叶紫珠 pi pa ye zi zhu

Shrubs 1–4 m tall; branchlets, petioles, and inflorescences densely yellow-brown stellate tomentose. Petiole 1–3 mm; leaf blade oblong-lanceolate, elliptic, or ovate-elliptic, 11–22 × 4–8 cm, abaxially densely yellow-brown stellate tomentose, adaxially glabrous or slightly pilose especially on veins, both surfaces obscurely yellow glandular, margin serrate. Cymes 3–6 cm across; peduncle 1–2 cm or longer. Calyx tubular, 2–2.5 mm, tube tomentose, teeth acute. Corolla pink to purple, lobes densely tomentose. Stamens exserted. Style longer than stamens. Fruit globose, ca. 1.5 mm in diam. Fl. Jul–Aug, fr. Sep–Dec.

100–900 m. Fujian, Guangdong, Hainan, S Henan, Hunan, Jiangxi, Taiwan, Zhejiang [Japan, Vietnam].

- 1a. Leaf blade 4–8 cm wide; flowers subsessile 1a. var. *kochiana*
- 1b. Leaf blade ca. 4 cm wide; flowers pedicellate 1b. var. *laxiflora*

1a. *Callicarpa kochiana* var. *kochiana*

枇杷叶紫珠 pi pa ye zi zhu

Callicarpa longiloba Merrill; *C. loureiri* Hooker & Arnott ex Merrill.

Leaf blade 12–22 × 4–8 cm. Peduncle 1–2 cm. Flowers subsessile. Fl. Jul–Aug, fr. Sep–Dec.

Forest edges, forests in valleys; 100–900 m. Fujian, Guangdong, S Henan, Hunan, Jiangxi, Taiwan, Zhejiang [Japan, Vietnam].

Medicinal.

1b. *Callicarpa kochiana* var. *laxiflora* (Chang) W. Z. Fang, Fl. Reipubl. Popularis Sin. 65(1): 31. 1982.

散花紫珠 san hua zi zhu

Callicarpa loureiri Hooker & Arnott ex Merrill var. *laxiflora* Chang, Acta Phytotax. Sin. 1: 276. 1951.

Leaf blade 11–15 × ca. 4 cm. Peduncles and pedicels longer than in var. *kochiana*. Fl. Aug.

• Mountain slopes; 100–400 m. Hainan.

2. *Callicarpa arborea* Roxburgh, Fl. Ind. 1: 405. 1820.

木紫珠 mu zi zhu

Trees ca. 8 m tall; branchlets, inflorescences, and petioles densely tomentose, hairs stellate or verticillately branched. Leaf blade elliptic, oblong-elliptic, or ovate, 13–37 × 7–13 cm, leathery, abaxially densely yellow-brown stellate tomentose, adaxially dark green and shiny, base cuneate to rounded, margin entire. Cymes 6–11 cm across; peduncle 4-angled, longer than petioles. Calyx cup-shaped, truncate or nearly so, outside densely gray stellate tomentose. Corolla purple, ca. 3 mm. Stamens much longer than corolla. Ovary densely stellate tomentose. Fruit purple-brown, ca. 2 mm in diam. Fl. May–Jul, fr. Aug–Dec.

Mixed forests on mountain slopes; 1000–2500 m. Guangxi, SE Xizang, S Yunnan [Bangladesh, Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Thailand, Vietnam].

3. *Callicarpa yunnanensis* W. Z. Fang, Fl. Reipubl. Popul-aris Sin. 65(1): 209. 1982.

云南紫珠 yun nan zi zhu

Trees 12–18 m tall; branchlets, petioles, and inflorescences gray-brown stellate tomentose. Petiole 1.5–3 cm; leaf blade elliptic to ovate-elliptic, (12–)20(–27) × (7–)9(–13.5) cm, papery, abaxially stellate tomentose, adaxially glabrescent, both surfaces densely red-brown glandular, base cuneate, margin entire. Cymes 8–13 cm across; peduncle robust, 4–5 cm. Calyx cup-shaped, ca. 0.8 mm, densely gray stellate tomentose. Corolla purple, ca. 3 mm. Filaments ca. 2 × as long as corolla. Ovary pubescent, brown-red glandular. Fruit purple, ca. 3 mm in diam.

Mixed forests in valleys; 500–600 m. S Yunnan [Vietnam].

Callicarpa erioclona Schauer was erroneously reported from Yunnan in vol. 1 of Fl. Yunnan. (1977), but *C. yunnanensis* differs in having petioles and inflorescences gray-brown stellate tomentose and leaf blade margins entire.

4. *Callicarpa integerrima* Champion, Hooker's J. Bot. Kew Gard. Misc. 5: 135. 1853.

全缘叶紫珠 quan yuan ye zi zhu

Shrubs, climbing; young branchlets, petioles, and inflorescences densely yellow-brown tomentose, hairs verticillately branched to densely dendritic. Petiole ca. 1–2 cm; leaf blade elliptic to ovate, 15–17 × 3–9 cm, abaxially tomentose, adaxially dark green and glabrescent, base cuneate to rounded, margin entire, apex acuminate to acute. Flowering stems with reduced leaves so that cymes form a terminal panicle. Cymes 6–11 cm across; peduncle 2–5 cm. Corolla purple, ca. 2–2.5 mm, glabrous. Stamens 2 × or more as long as corolla. Fruit purple, ca. 2 mm in diam., stellate tomentose when young, glabrescent. Fl. May-Jul, fr. Aug-Nov.

• 200–1500 m. Fujian, Guangdong, Guangxi, W Hubei, Jiangxi, E Sichuan, S Zhejiang.

- 1a. Pedicels, calyces, and ovaries stellate tomentose 4a. var. *integerrima*
1b. Pedicels, calyces, and ovaries glabrous 4b. var. *chinensis*

4a. *Callicarpa integerrima* var. *integerrima*

全缘叶紫珠 *quan yuan ye zi zhu*

Leaf blade abaxially densely gray-yellow tomentose, adaxially yellow-brown stellate tomentose. Pedicel and calyx densely stellate tomentose. Ovary stellate tomentose. Fl. Jun-Jul, fr. Aug-Nov.

• Mixed forests on mountain slopes and in valleys; 200–700 m. Fujian, Guangdong, Guangxi, Jiangxi, S Zhejiang.

4b. *Callicarpa integerrima* var. *chinensis* (P'ei) S. L. Chen, Novon 1: 58. 1991.

藤紫珠 *teng zi zhu*

Callicarpa formosana Rolfe var. *chinensis* P'ei, Mem. Sci. Soc. China 1(3): 30. 1932; *C. pedunculata* R. Brown var. *chinensis* (P'ei) Metcalf; *C. peii* Chang.

Leaves, pedicels, calyces, corollas, and ovaries glabrous or only leaves pubescent when young. Fl. May-Jul, fr. Aug-Nov.

• Mixed forests in valleys; 300–1500 m. NW Guangdong, Guangxi, W Hubei, Jiangxi, E Sichuan.

5. *Callicarpa longibracteata* Chang, Acta Phytotax. Sin. 1: 277. 1951.

长苞紫珠 *chang bao zi zhu*

Shrubs ca. 3 m tall. Young branches uniformly yellow stellate tomentose. Petiole ca. 2 cm; leaf blade oblong-elliptic to elliptic-lanceolate, 15–20 × 5–8 cm, abaxially densely yellow-gray stellate tomentose, adaxially glabrous but stellate tomentose along midvein when young, base obtuse to rounded and oblique, margin entire or serrulate above to middle, veins 14 pairs. Cymes 6–9 cm across; peduncle 3–5 cm; bracts lanceolate, 3–4 × 1 cm. Calyx campanulate, stellate tomentose; teeth linear, ca. 1 mm. Corolla pink, ca. 2 mm, puberulent. Filaments ca. 5 mm; anthers ca. 0.6 mm. Ovary glabrous. Style 6–7 mm. Fruit ca. 1.5 mm in diam. Fl. and fr. Aug.

• Mixed forests; 100–300 m. Hong Kong.

6. *Callicarpa nudiflora* Hooker & Arnott, Bot. Beechey Voy. 206. 1836.

裸花紫珠 *luo hua zi zhu*

Callicarpa acuminata Roxburgh (1832), not Kunth (1818); *C. acuminata* var. *angustifolia* Metcalf; *C.*

macrophylla Vahl var. *sinensis* C. B. Clarke; *C. reevesii* Wallich ex Schauer.

Shrubs or small trees; young branchlets, petioles, abaxial leaf surfaces, and inflorescences unevenly gray-brown stellate tomentose. Leaf blade ovate-elliptic to lanceolate, 12–22 × 4–7 cm, abaxially densely gray-brown unevenly stellate tomentose, adaxially dark green-black and glabrescent except for stellate tomentose veins, base obtuse to subrounded, margin serrate, slightly undulate, or subentire. Cymes 8–13 cm across; peduncle 3–8 cm; bracts linear-lanceolate. Pedicel ca. 1 mm. Calyx usually glabrous, truncate to obscurely 4-dentate. Corolla purple to pink, ca. 2 mm, glabrous. Stamens 2–3 × as long as corolla. Ovary glabrous. Fruit ca. 2 mm in diam. Fl. Jun-Aug, fr. Aug-Dec.

Mixed forests; 1000 m. Guangdong, Guangxi, Hainan [Bangladesh, India, Malaysia, Myanmar, Singapore, Sri Lanka, Vietnam].

Medicinal.

7. *Callicarpa macrophylla* Vahl, Symb. Bot. 3: 13. 1794.

大叶紫珠 *da ye zi zhu*

Callicarpa dunniana H. Léveillé; *C. incana* Roxburgh; *C. macrophylla* var. *kouytchensis* H. Léveillé.

Shrubs or small trees. Branchlets nearly 4-angled. Petiole robust, 1–3 cm, densely gray unevenly stellate tomentose; leaf blade oblong-lanceolate, narrowly elliptic, or ovate-elliptic, 10–23 × 5–11 cm, abaxially densely unevenly gray stellate tomentose and glandular, adaxially pubescent especially on veins, base cuneate to broadly obtuse, margin serrulate. Cymes 4–8 cm across, densely unevenly gray stellate tomentose. Calyx ca. 1 mm, subtruncate, gray stellate tomentose, yellow glandular. Corolla purple, ca. 2.5 mm, sparsely stellate tomentose. Anthers yellow glandular. Ovary puberulent. Fruit ca. 1.5 mm in diam., puberulent, glandular. Fl. and fr. Apr-Dec.

Mixed forests; 100–2000 m. Guangdong, Guangxi, Guizhou, Yunnan [Bhutan, India, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam].

Indian material differs from Chinese collections in having glabrous ovaries.

8. *Callicarpa acutifolia* Chang, Acta Phytotax. Sin. 1: 284. 1951.

尖叶紫珠 *jian ye zi zhu*

Shrubs. Branchlets 4-angled, stellate tomentose, densely yellow glandular, nodes with a transverse scar. Petiole ca. 1.5 cm; leaf blade lanceolate to oblong-lanceolate, 11–16 × 2–5 cm, yellow glandular, abaxially stellate tomentose, adaxially puberulent especially along veins, base acute, margin serrate, apex acute. Cymes 7–9 cm across; peduncle 3–5.5 cm. Calyx ca. 1 mm, subtruncate, glabrous. Corolla ca. 2.5 mm, glabrous. Filaments ca. 4 mm. Ovary glabrous, glandular. Fruit black when dry, ca. 1.5 mm in diam. Fl. Jul-Sep, fr. Oct.

• Mountain slopes, along stream banks; 100–700 m. Guang-dong, Guangxi.

9. *Callicarpa loboapiculata* Metcalf, Lingnan Sci. J. 11: 406. 1932.

尖萼紫珠 *jian e zi zhu*

Shrubs; branchlets, petioles, and inflorescences densely yellow-brown dendritic velvety. Petiole 2–3 cm; leaf blade elliptic, 12–22 × 5–7 cm, unevenly stellate tomentose and yellow glandular, adaxially glabrescent, base cuneate, margin

serrulate, apex acuminate. Cymes 4–6 cm across; peduncle 1–1.5 cm. Pedicel ca. 1 mm. Calyx campanulate, prominently 4-dentate, sparsely stellate tomentose to glabrous. Corolla purple, ca. 2.5 mm; lobes 4, usually puberulent. Filaments ca. 3.5 mm. Fruit yellow, ca. 1.2 mm in diam., glandular. Fl. and fr. Jul-Dec.

• Mixed forests; 300–500 m. Guangdong, Guangxi, Guizhou, Hainan, Hunan.

10. *Callicarpa minutiflora* Y. Y. Qian, Guihaia 11: 121. 1991.

细花紫珠 xi hua zi zhu

Shrubs ca. 2 m tall. Branchlets nearly 4-angled, grooved, densely stellate pubescent, yellowish glandular. Petiole slender, 1–2.5 cm; leaf blade elliptic, 10–16 × 4–7 cm, stellate pubescent and yellowish glandular, base cuneate, apex acuminate, veins 7–9 pairs. Cymes 4–6 cm across, 5–7-branched; peduncle 0.6–1.5 cm. Calyx 0.7–1 mm, subtruncate, stellate pubescent, outside yellow glandular. Corolla 2–2.5 mm, densely gray tomentellous. Stamens exserted; anthers longitudinally dehiscent. Ovary stellate pubescent, yellow glandular. Fl. Aug.

• Forests; 1100 m. Yunnan (Jiangcheng Xian).

Similar to *Callicarpa acutifolia* and *C. giraldii* var. *subcanescens* but differs in having smaller flowers and corolla lobes densely gray tomentellous.

11. *Callicarpa hypoleucophylla* Wei-Fang Lin & Jen-Li Wang, Bot. Bull. Acad. Sin., n.s. 8: 185. 1967.

里白杜虹花 li bai du hong hua

Shrubs 2–3 m tall. Branchlets terete, stellate tomentose. Petiole ca. 1 cm; leaf blade lanceolate to lanceolate-oblong, 10–15 × 2–3.5 cm, abaxially whitish felted tomentose, adaxially stellate pubescent but subglabrescent, base cuneate to narrowly cuneate, margin finely serrate, apex acuminate to caudate, veins 9–12 pairs. Cymes ca. 2 cm; peduncle ca. 2 cm. Calyx ca. 10 × 8 mm, slightly 4-dentate to subtruncate, outside with stellate hairs. Corolla white, campanulate, ca. 1.5 cm; lobes 4, apically rounded. Stamens 4, long exserted. Fruit white or pale purplish, globose, ca. 2 mm in diam.

• Mixed forests on mountain slopes; 1000–1200 m. Taiwan.

Specimens of this species have not been seen by the authors.

12. *Callicarpa candicans* (N. L. Burman) Hochreutiner, Candollea 5: 190. 1934.

白毛紫珠 bai mao zi zhu

Urtica candicans N. L. Burman, Fl. Indica 197 (typ. err. 297). 1768; *Callicarpa cana* Linnaeus.

Shrubs 1–2 m tall. Branchlets 4-angled, with dense gray stellate hairs. Leaf blade elliptic, ovate-elliptic, or broadly ovate, 8–15 × 4–7 cm, densely serrate, abaxially with dense gray stellate hairs, adaxially turning blackish when dry and glabrous to pubescent along veins, base acute to cuneate, margin densely serrate, apex acuminate to acute. Cymes 2–3 cm across; peduncle ca. 0.5 cm, with dense gray stellate hairs; bracts small, linear. Calyx obscurely 4-dentate to subtruncate, with dense gray stellate hairs. Corolla pinkish to pink, ca. 2 mm, with sparse stellate hairs. Filaments ca. 2 × as long as corolla tube. Ovary glabrous. Fruit black-purple, ca. 2 mm in diam. Fl. and fr. Apr-Dec.

Mountain slopes along roadsides and in open waste places; 100–500 m. Guangdong, Hainan [Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam; Australia].

Medicinal.

13. *Callicarpa gracilipes* Rehder in Sargent, Pl. Wilson. 3: 371. 1916.

湖北紫珠 hu bei zi zhu

Shrubs 2–3.5 m tall; branchlets, petioles, and cymes with brownish stellate hairs. Petiole 5–10 mm; leaf blade ovate-elliptic to ovate, 3–6 × 2–3 cm, abaxially with dense gray stellate hairs and yellow glands, adaxially green-black when dry and glabrous, base broadly cuneate, margin entire or sparsely dentate, apex acute to acuminate. Cymes 1–1.5 cm across; peduncle equal or longer than petioles; bracts linear. Calyx cup-shaped, ca. 1 mm, truncate to minutely 4-dentate, outside with sparse stellate hairs. Corolla purple to red, ca. 3 mm, outside with a few stellate hairs. Fruit pinkish purple, oblong, puberulent, yellow glandular. Fr. Aug-Oct.

• Mixed forests on mountain slopes; 200–1500 m. W Hubei, E Sichuan.

14. *Callicarpa poilanei* Dop, Bull. Soc. Hist. Nat. Toulouse 64: 502. 1932.

白背紫珠 bai bei zi zhu

Trees, 5–8 m tall. Branchlets 4-angled, densely silky-velvety, nodes with a transverse scar. Petiole ca. 1 cm; leaf blade narrowly elliptic to elliptic, 10–13 × 3.5–4.5 cm, abaxially densely gray rusty colored silky, adaxially brown when dry and mealy stellate tomentellous when young, base cuneate, margin serrulate to subundulate, apex acute to acuminate. Cymes ca. 2 cm across; peduncle 4-angled, usually as long as petioles; bracts small. Pedicel ca. 1 mm. Calyx ca. 1 mm, truncate to minutely 4-dentate, gray stellate velvety. Corolla purple, ca. 3 mm, puberulent. Filaments longer than corolla. Ovary glabrous. Fl. May-Jun.

Mixed forests; 200 m. Yunnan (Hekou Xian) [Cambodia, Thailand, Vietnam].

15. *Callicarpa formosana* Rolfe, J. Bot. 20: 358. 1882.

杜虹花 du hong hua

Shrubs 1–3 m tall; branchlets, petioles, and cymes densely gray-yellow stellate tomentose. Petiole robust, 1–2.5 cm; leaf blade ovate-elliptic to elliptic or narrowly oblong-lanceolate, 6–17 × 2–8 cm, abaxially gray-yellow stellate tomentose and yellow glandular, adaxially minutely hispid, base cuneate, obtuse, or rounded, margin serrate, apex acuminate or caudate. Cymes 3–4 cm across; peduncle 1.5–2.5 cm; bracts small. Calyx cup-shaped, gray-yellow stellate tomentose; teeth 4, triangular. Corolla purple to purplish, ca. 2.5 mm, glabrous. Stamens ca. 5 mm. Ovary glabrous. Fruit purple, ca. 2 mm in diam.

400–1600 m. Fujian, Guangdong, Guangxi, Hainan, S Jiangxi, Taiwan, SE Yunnan, SE Zhejiang [Japan (Okinawa), Philippines].

1a. Leaf blade elliptic to ovate-elliptic

..... 15a. var. *formosana*

1b. Leaf blade narrowly oblong-lanceolate

..... 15b. var. *longifolia*

15a. *Callicarpa formosana* var. *formosana*

杜虹花 du hong hua

Callicarpa aspera Handel-Mazzetti; *C. integerrima* Champion var. *serrulata* H. L. Li; *C. ningpoensis* Matsumura; *C. rubella* Lindley f. *robusta* P'ei.

Leaf blade elliptic to ovate-elliptic, 6–15 × 3–8 cm, base obtuse to rounded, apex acuminate. Fl. May-Jul, fr. Aug-Nov. $2n = 36$.

Mixed forests on mountain slopes and along streams; below 1600 m. Fujian, Guangdong, Guangxi, Hainan, S Jiangxi, Taiwan, SE Yunnan, SE Zhejiang [Japan (Okinawa), Philippines].

Medicinal.

15b. *Callicarpa formosana* var. *longifolia* Suzuki, Trans. Nat. Hist. Soc. Taiwan 25: 131. 1935.

长叶杜虹花 chang ye du hong hua

Callicarpa pedunculata R. Brown var. *longifolia* (Suzu-ki) Chang.

Leaf blade narrowly oblong-lanceolate, 13–17 × 2–3 cm, base cuneate, apex caudate, veins abaxially pubescent.

• Mixed forests; 400–700 m. Taiwan.

16. *Callicarpa pseudorubella* Chang, Acta Phytotax. Sin. 1: 287. 1951.

拟红紫珠 ni hong zi zhu

Shrubs ca. 1 m tall; branchlets, petioles, and cymes gray-brown stellate tomentose. Petiole 3–5 mm; leaf blade narrowly elliptic-lanceolate, 3–5.5 × 1.5–2 cm, yellow glandular, abaxially stellate tomentose along veins, adaxially sparsely pilose, base cuneate to broadly cuneate, margin serrate, apex acuminate. Cymes ca. 1.5 cm across; peduncle 8–10 mm; bracts small. Calyx ca. 1 mm, minutely 4-dentate, with single hairs, yellow glandular. Corolla pink, ca. 2 mm, puberulent; lobes 4, oblong. Stamens slightly exerted. Ovary yellow glandular. Fruit ca. 2 mm in diam. Fl. late spring to summer.

• Mountain slopes; 400–500 m. Guangdong.

17. *Callicarpa pauciflora* Chun ex Hung-Ta Chang, Acta Phytotax. Sin. 1: 275. 1951.

少花紫珠 shao hua zi zhu

Subshrubs to shrubs, 60–100 cm tall. Branchlets gray-yellow, terete, with small lenticels, stellate tomentose. Petiole 4–6 mm; leaf blade elliptic to ovate-elliptic, 5–8(–13) × 2.5–3.5(–5.5) cm, abaxially stellate tomentose, adaxially puberulent, base cuneate, margin serrate, apex acute to acuminate. Cymes ca. 1 cm across; peduncle 4–6 mm; bracts small. Calyx campanulate, stellate tomentose; teeth 4, linear-lanceolate, 1–1.5 mm. Corolla pinkish, ca. 4 mm, sparsely stellate tomentose; lobes 4, oblong. Filaments 4–5 mm; anthers ca. 1.2 mm. Ovary slightly puberulent. Style ca. 6 mm. Fl. late spring to summer.

• Usually along rivers; 100–400 m. Guangdong (Ruyan Xian), Jiangxi (Shangrao Xian).

18. *Callicarpa giraldii* Hesse ex Rehder in Bailey, Stand. Cycl. Hort. 2: 629. 1914.

老鸦糊 lao ya hu

Shrubs 1–3(–5) m tall. Petiole 0.6–2 cm; leaf blade lanceolate, oblong, oblong-elliptic, elliptic, broadly elliptic, obovate-oblong, or broadly ovate, 5–17 × 2–10 cm, papery, base cuneate, narrowly cuneate, obtuse, or rounded, margin serrate, apex acuminate. Cymes 1–3 cm across, stellate

tomentose. Calyx campanulate, ca. 1.5 mm, sparsely stellate tomentose when young, glabrescent, yellow glandular; teeth less than 0.5 mm, obtuse. Corolla purple, ca. 3 mm, slightly puberulent, yellow glandular. Stamens ca. 4–6 mm; anthers ovate, yellow glandular on connective. Ovary puberulent. Fruit purple, 2.5–4 mm in diam., stellate tomentose when young, glabrescent. Fl. May-Jul, fr. Jul-Nov.

• 200–3400 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi, Sichuan, Yunnan, Zhejiang.

This species can be reliably distinguished from *Callicarpa bodinieri* only in having yellow instead of red glands. The two taxa overlap in all other features including distribution, and their maintenance as distinct species merits further investigation.

1a. Leaf blade lanceolate-oblong to broadly elliptic 18a. var. *giraldii*

1b. Leaf blade elliptic to ovate or oblong-elliptic to obovate-oblong.

2a. Leaf blade ovate to elliptic, abaxially with gray stellate hairs 18b. var. *subcanescens*

2b. Leaf blade oblong-elliptic to obovate-oblong, abaxially with gray-brown stellate hairs

..... 18c. var. *chinyunensis*

18a. *Callicarpa giraldii* var. *giraldii*

老鸦糊 lao ya hu

Callicarpa bodinieri H. Léveillé var. *giraldii* (Hesse ex Rehder) Rehder; *C. mairei* H. Léveillé.

Branchlets gray-yellow stellate tomentose. Leaf blade lanceolate-oblong to broadly elliptic, 5–15 × 2–7 cm, abaxially green, sparsely stellate tomentose, and small yellow glandular, adaxially puberulent yellow-green, base cuneate. Fl. May-Jun, fr. Jul-Nov.

• Mixed forests; 200–3400 m. Anhui, Fujian, Gansu, Guang-dong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, S Shaanxi, Sichuan, Yunnan, Zhejiang.

Medicinal.

18b. *Callicarpa giraldii* var. *subcanescens* Rehder in Sar-gent, Pl. Wilson. 3: 368. 1916.

毛叶老鸦糊 mao ye lao ya hu

Callicarpa bodinieri H. Léveillé var. *lyi* (H. Léveillé) Rehder; *C. giraldii* var. *lyi* (H. Léveillé) C. Y. Wu; *C. lyi* H. Léveillé; *C. grisea* Handel-Mazzetti; *C. inamoena* C. Y. Wu.

Leaf blade elliptic to broadly ovate, 10–17 × 4–10 cm, base narrowly cuneate to cuneate. Cymes and leaf blade abaxial surface densely gray stellate tomentose. Fl. May-Jul, fr. Jul-Oct.

• Mixed forests; usually below 2300 m. Anhui, Guangdong, Guangxi, Guizhou, Henan, Hunan, S Jiangsu, Jiangxi, Sichuan, Yun-nan, Zhejiang.

Although placed in *Callicarpa bodinieri* in vol. 65(1) of Fl. Reipubl. Popularis Sin. (1982), the holotype of *C. giraldii* var. *subcanescens* has yellow glands and must be placed here.

18c. *Callicarpa giraldii* var. *chinyunensis* (P'ei & W. Z. Fang) S. L. Chen, Novon 1: 58. 1991.

缙云紫珠 jin yun zi zhu

Callicarpa chinyunensis P'ei & W. Z. Fang in W. Z. Fang, Fl. Reipubl. Popularis Sin. 65(1): 209. 1982.

Branchlets purple-brown, distinctly lenticellate. Leaf blade oblong-elliptic to obovate-oblong, 8–13.5 × 2.5–4.5 cm, abaxially with densely gray-brown stellate hairs, adaxially minutely hispid and scabrous, base obtuse to rounded. Cymes dense. Fl. May.

- Mixed forests on mountain slopes; 300–500 m. Sichuan.

19. *Callicarpa longifolia* Lamarck, Encycl. 1: 563. 1785.

长叶紫珠 *chang ye zi zhu*

Shrubs 2–3(–5) m tall. Branchlets 4-angled, nodes with a transverse scar. Petiole slender, 0.5–1.5 mm; leaf blade narrowly lanceolate to oblong-elliptic, 8–20 × 2–6 cm, adaxially glabrous, base cuneate to narrowly cuneate, margin serrate, apex caudate-acuminate to cuneate, midvein and lateral veins abaxially very prominent. Cymes 2–3 cm across; peduncle slender, 0.5–1.5 cm. Calyx cup-shaped, ca. 1 mm, truncate to minutely 4-dentate, gray puberulent. Corolla pale purple, ca. 2 mm, slightly puberulent. Stamens 2–3 × as long as corolla; anthers ovate, ca. 1 mm. Ovary puberulent. Fruit ca. 1.5 mm in diam., stellate pubescent. Fl. May–Aug, fr. Aug–Dec.

800–1700 m. Guangdong, Guangxi, Guizhou, Hainan, Sichuan, Taiwan, Yunnan [India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam].

- 1a. Leaf blade narrowly lanceolate, abaxially subglabrous 19c. var. *lanceolaria*
- 1b. Leaf blade oblong-elliptic, abaxially with stellate hairs.
 - 2a. Leaf blade abaxially sparsely yellow-brown stellate pilose 19a. var. *longifolia*
 - 2b. Leaf blade abaxially with densely grayish minutely stellate hairs 19b. var. *floccosa*

19a. *Callicarpa longifolia* var. *longifolia*

长叶紫珠 *chang ye zi zhu*

Branchlets, petioles, and inflorescences yellowish brown stellate tomentose. Leaf blade oblong-elliptic, 9–20 × 3–6 cm, abaxially yellowish brown stellate tomentose and yellow glandular. Fl. May–Aug, fr. Aug–Dec.

Mixed forests; below 1400 m. Guangdong, Taiwan, Yunnan [India, Indonesia, Myanmar, Philippines, Vietnam].

19b. *Callicarpa longifolia* var. *floccosa* Schauer in A. de Candolle, Prodr. 11: 645. 1847.

白毛长叶紫珠 *bai mao chang ye zi zhu*

Branches and cymes with gray mealy stellate hairs. Leaf blade oblong-elliptic, 12–16 × 3–5 cm, abaxially with mealy gray stellate hairs. Fl. Aug, fr. Sep–Nov.

Mixed forests on mountain slopes; 1000 m. Guangxi, Guizhou, Sichuan [India, Indonesia, Philippines, Singapore].

19c. *Callicarpa longifolia* var. *lanceolaria* (Roxburgh) C. B. Clarke in J. D. Hooker, Fl. Brit. Ind. 4: 570. 1885.

披针叶紫珠 *pi zhen ye zi zhu*

Callicarpa lanceolaria Roxburgh, Fl. Ind. 1: 409. 1820.

Leaf blade narrowly lanceolate, 8–15 × 2–5 cm, glabrous except midvein sparsely puberulent, both surfaces small yellow glandular. Fl. Jun–Jul, fr. Aug–Dec.

Mixed forests; 800–1700 m. Hainan, Yunnan [Bangladesh, India, Malaysia, Vietnam].

20. *Callicarpa prolifera* C. Y. Wu, Fl. Yunnan. 1: 404. 1977.

抽芽紫珠 *chou ya zi zhu*

Shrubs ca. 2 m tall. Branchlets dark brown, terete, with gray lenticels and gray-brown stellate hairs. Leaf blade oblong-lanceolate to ovate or lanceolate, abaxially with stellate hairs along veins, margin entire, slightly sinuate, or serrulate, apex acuminate to caudate-acuminate. Cymes ca. 1 cm across, with branchlets growing out from them, with yellow-brown stellate hairs; peduncle slender, as long as pedicels; bracts linear, ca. 2 mm. Calyx subtruncate, glabrous. Corolla purplish; tube ca. 2 mm, glabrous. Stamens ca. 4 mm; anthers elliptic, ca. 1.2 mm. Fruit purple, 2–3 mm in diam., glabrous, yellow glandular. Fr. autumn.

- 900–2200 m. Guangxi, Yunnan.

- 1a. Petiole 5–10 mm; leaf blade oblong-lanceolate to ovate 20a. var. *prolifera*
- 1b. Petiole nearly absent; leaf blade lanceolate 20b. var. *rubroglandulosa*

20a. *Callicarpa prolifera* var. *prolifera*

抽芽紫珠 *chou ya zi zhu*

Petiole 5–10 mm, stellate tomentose, yellow glandular; leaf blade oblong-lanceolate to ovate, 1–9(–13) × 1.5–3(–4.5) cm, unequally paired, abaxially orange glandular, adaxially with stellate hairs along veins and densely yellow to yellow-brown glandular, base broadly cuneate. Calyx yellow glandular.

- Mixed forests; 1500–2200 m. Guangxi, Yunnan.

20b. *Callicarpa prolifera* var. *rubroglandulosa* S. L. Chen, Novon 1: 58. 1991.

红腺抽芽紫珠 *hong xian chou ya zi zhu*

Petiole nearly absent; leaf blade lanceolate, (6–)12–16(–19) × (1–)2–4 cm, base decurrent, both surfaces subglabrous, abaxially orange glandular. Calyx outside densely orange glandular.

- Forests in valleys; 900 m. N Guangxi.

21. *Callicarpa pingshanensis* C. Y. Wu ex W. Z. Fang in W. Z. Fang, Fl. Reipubl. Popularis Sin. 65(1): 210. 1982.

屏山紫珠 *ping shan zi zhu*

Shrubs 1.5–2 m tall. Branchlets purple-brown, distinctly lenticellate, with sparse stellate hairs when young, sub-glabrescent. Petiole ca. 6 mm, with stellate hairs; leaf blade oblong-elliptic to elliptic, 8–14 × 3–5 cm, narrowed below middle, membranous, abaxially subglabrous and densely yellow glandular, adaxially puberulent on veins, base obtuse, margin triangular serrulate, apex acute to caudate-acuminate, veins 8–10 pairs. Cymes 3–9-flowered, with branchlets growing out from them; peduncle ca. 5 mm, with stellate hairs; bracts linear. Pedicel glabrous. Calyx cup-shaped, ca. 1 mm, truncate to subtruncate, glabrous. Corolla purple; tube ca. 4 mm, glabrous. Stamens ca. 5 mm; anthers elliptic, ca. 1 mm. Ovary globose, glabrous. Fl. late spring to summer.

• Mixed forests on mountain slopes; 700–1600 m. Sichuan (Pingshan Xian).

22. *Callicarpa longissima* (Hemsley) Merrill, Philipp. J. Sci. 12: 108. 1917.

尖尾枫 jian wei feng

Callicarpa longifolia Lamarck var. *longissima* Hemsley, J. Linn. Soc., Bot. 26: 253. 1890.

Shrubs or small trees, 1–3(–7) m tall. Branchlets purplish brown, 4-angled. Petiole 1–1.5 cm; leaf blade lanceolate to elliptic-lanceolate, 13–25 × 2–7 cm, abaxially glabrous, adaxially subglabrous except long villous pubescence mainly along veins, base cuneate, margin subentire to obscurely serrulate, apex acute; veins 12–20 pairs, elevated on both surfaces. Cymes 3–6 cm across; peduncle 1.5–3 cm. Calyx subtruncate to obscurely dentate, glabrous, glandular. Corolla purple, ca. 2.5 mm, glabrous. Stamens ca. 2 × as long as corolla tube. Ovary glabrous. Fruit 1–1.5 mm in diam., glabrous, small glandular. Fl. Jul–Sep, fr. Aug–Dec.

Mixed forests or open waste places on mountain slopes; below 1200 m. Fujian, Guangdong, Guangxi, Hainan, Jiangxi, Sichuan, Taiwan [Japan, Vietnam].

23. *Callicarpa luteopunctata* Chang, Acta Phytotax. Sin. 1: 292. 1951.

黄腺紫珠 huang xian zi zhu

Shrubs ca. 2 m tall; petioles and cymes densely brown stellate tomentellous. Branchlets yellowish gray, terete. Petiole 1–1.5 cm; leaf blade oblong-elliptic to ovate-lanceolate, 7–16 × 2–5 cm, densely small yellowish glandular, subglabrous to adaxially sparsely yellowish brown stellate tomentellous along midvein and lateral veins, base narrowly cuneate, margin irregularly serrate, apex acuminate. Cymes 2–3 cm across; peduncle 4–7 mm; bracts small, linear. Calyx cup-shaped, ca. 0.7 mm, subtruncate to obscurely dentate, usually glabrous, yellow glandular. Corolla purple, ca. 1.4 mm, glabrous. Stamens usually 2 × as long as corolla. Ovary glabrous, yellow glandular. Fruit ca. 1 mm in diam., yellow glandular. Fl. Jun–Jul, fr. Aug–Oct.

• Mixed forests on mountain slopes or in valleys; 800–2300 m. Sichuan, Yunnan.

24. *Callicarpa dichotoma* (Loureiro) K. Koch, Dendrologie 2: 336. 1872.

白棠子树 bai tang zi shu

Porphyra dichotoma Loureiro, Fl. Cochinch. 1: 70. 1790.

Shrubs 1(–3) m tall, much branched. Branchlets slender, with stellate hairs when young. Leaves sessile or subsessile; leaf blade lanceolate to obovate, 2–6(–10) × 1–3(–4) cm, papery, abaxially with small yellow-glandular stellate hairs on margins, adaxially glabrous and subscabrous, base cuneate, margin coarsely dentate along apical part, apex usually very short acuminate with an obtuse tip, veins 4 or 5 pairs. Cymes 1–2.5 cm across; peduncle slender, 8–12 cm; bracts linear. Calyx cup-shaped, less than 1 mm, subtruncate, obscurely dentate, outside few glandular. Corolla purple, tube 2 × as long as calyx tube. Stamens exerted; filaments 2 × as long as corolla tube, glabrous. Ovary glabrous, sparsely yellow glandular. Fruit subglobose, 1–2 mm in diam., with few glands. $2n = 36$.

Mixed forests on mountain slopes; below 600 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shandong, Taiwan, Zhejiang [Japan, Korea, Vietnam].

Medicinal.

25. *Callicarpa kotoensis* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 219. 1911.

红头紫珠 hong tou zi zhu

Callicarpa antaoensis Hayata; *C. japonica* Thunberg var. *kotoensis* (Hayata) Masamune.

Shrubs small. Branchlets with yellowish brown stellate hairs. Petiole less than 1 cm; leaf blade elliptic to elliptic-lanceolate, abaxially yellowish brown stellate tomentose and small yellow glandular on veins, adaxially glabrous, base cuneate, margin serrate, apex acute, veins 7–9 pairs. Cymes ca. 4 cm across, with stellate hairs; peduncle 1–2 cm; bracts linear-lanceolate, ca. 10 × 2 mm. Calyx cup-shaped, sub-truncate. Corolla ca. 2.5 mm. Stamens 2 × as long as corolla tube. Ovary glabrous. Fl. summer.

• Near coast; 100 m. Taiwan.

26. *Callicarpa sionsaiensis* Metcalf, Lingnan Sci. J. 11: 407. 1932.

上狮紫珠 shang shi zi zhu

Callicarpa japonica Thunberg f. *glabra* P'ei.

Shrubs ca. 2 m tall; petioles and inflorescences sparsely stellate tomentose. Branchlets gray-yellow. Petiole 1.5–2 cm; leaf blade elliptic to ovate-elliptic, 10–14 × 4–6 cm, abaxially small yellow glandular, adaxially glabrous or subglabrous, base cuneate to obtuse, margin subentire to subserrate, apex acute to acuminate. Cymes 2–4 cm across; peduncle as long as petioles. Calyx cup-shaped, truncate, glabrous. Fruit dark brown when dry, ca. 3 mm in diam., glabrous. Fl. early summer.

• Mountain slopes; below 100 m. E Fujian.

27. *Callicarpa pilosissima* Maximowicz, Bull. Acad. Imp. Sci. Saint Pétersbourg, sér. 3, 31: 76. 1887.

长毛紫珠 chang mao zi zhu

Callicarpa pilosissima var. *henryi* Yamamoto.

Shrubs; branchlets, petioles, and peduncles usually densely yellow-brown long villous. Petiole ca. 5 mm; leaf blade narrowly lanceolate, 10–18 × 2–3 cm, abaxially densely yellow-brown pilose and glandular, adaxially sparsely pubescent, base slightly cordate to rounded, margin obscurely serrulate, apex ± acuminate. Cymes 2–3 cm across; peduncle 1–1.5 cm. Pedicel ca. 1 mm. Calyx ca. 1 mm, sparsely pilose, sometimes with short gland-tipped hairs. Corolla ca. 2 mm, glabrous. Stamens 4–5 mm; anthers small, rounded. Ovary pubescent, glandular. Fruit ca. 1 mm in diam., glandular. Fl. Oct, fr. Oct–Dec.

• Mixed forests on mountain slopes; 500–1500 m. Taiwan.

28. *Callicarpa bodinieri* H. Léveillé, Repert. Spec. Nov. Regni Veg. 9: 456. 1911.

紫珠 zi zhu

Shrubs ca. 2 m tall; branchlets, petioles, and inflorescences with dense stellate hairs. Petiole 5–10 mm; leaf blade red glandular, abaxially subglabrous or stellate tomentose, adaxially pubescent. Cymes 3–4.5 cm across; peduncle less than 1 cm; bracts small. Pedicel ca. 1 mm. Calyx ca. 1 mm, teeth obtusely triangular, stellate tomentose. Corolla purple, ca. 3 mm, stellate tomentose. Stamens ca. 6 mm;

anthers elliptic, 1 mm, dark red glandular on connective. Ovary pubescent. Fruit purple, globose, ca. 2 mm in diam. Fl. Jun-Jul, fr. Aug-Dec.

200–2300 m. Anhui, Guangdong, Guangxi, Guizhou, S Henan, Hubei, Hunan, S Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang [Vietnam].

This species is often confused with *Callicarpa girdalii* which differs by its yellow glands.

- 1a. Leaf blade narrowly elliptic, elliptic, or ovate-elliptic, 4–7 cm wide, base cuneate
..... 28a. var. *bodinieri*
- 1b. Leaf blade lanceolate, oblanceolate, or obovate-oblong, 2–4 cm wide, base narrowly cuneate.
- 2a. Leaf blade abaxially grayish stellate pubescent
..... 28b. var. *rosthornii*
- 2b. Leaf blade subglabrous on both surfaces
..... 28c. var. *iteophylla*

28a. *Callicarpa bodinieri* var. *bodinieri*

紫珠 zi zhu

Callicarpa feddei H. Léveillé; *C. seguinii* H. Léveillé; *C. tsiangii* Moldenke.

Leaf blade narrowly elliptic, elliptic, or ovate-elliptic, 7–18 × 4–7 cm, papery, with small red to dark red glands, abaxially stellate tomentose, base cuneate, margin serrulate, apex long acuminate to acute. Calyx outside dark red glandular. Corolla dark red glandular. Fl. Jun-Jul, fr. Aug-Nov.

Mixed forests; 200–2300 m. Anhui, Guangdong, Guangxi, Guizhou, S Henan, Hubei, Hunan, S Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang [Vietnam].

Medicinal.

28b. *Callicarpa bodinieri* var. *rosthornii* (Diels) Rehder, J. Arnold Arbor. 15: 323. 1934.

南川紫珠 nan chuan zi zhu

Callicarpa longifolia Lamarck var. *rosthornii* Diels in Engler, Bot. Jahrb. Syst. 29: 548. 1900; *C. girdalii* Hesse ex Rehder var. *rosthornii* (Diels) Rehder.

Leaf blade oblanceolate to obovate-oblong, membranous, densely glandular, abaxially grayish stellate pubescent, base narrowly cuneate, margin serrate above middle.

• Mixed forests on mountain slopes; 500–1100 m. Sichuan (Nanchuan Xian).

28c. *Callicarpa bodinieri* var. *iteophylla* C. Y. Wu, Fl. Yunnan. 1: 406. 1977.

柳叶紫珠 liu ye zi zhu

Leaf blade lanceolate to oblanceolate, 6–13 × 2–4 cm, base narrowly cuneate, both surfaces subglabrous and dark red glandular. Calyx and corolla subglabrous, dark red glandular. Fl. Jun, fr. Sep-Dec.

• Mixed forests; 600–1600 m. S Yunnan.

29. *Callicarpa salicifolia* Pei & W. Z. Fang in W. Z. Fang, Fl. Reipubl. Popularis Sin. 65(1): 210. 1982.

水金花 shui jin hua

Shrubs ca. 2 m tall. Branchlets terete, grayish yellow, purplish, or purplish brown stellate tomentose when young, glabrescent. Leaf blade narrowly lanceolate to lanceolate, 5–14 × 0.8–3 cm, both surfaces subglabrous but midvein

subglabrous to sparsely stellate tomentose, abaxially dark purple glandular, base broadly cuneate to subrounded, margin sparsely serrate, apex acuminate. Cymes 1–2 cm across, dense purplish black glandular; peduncle ca. 5 mm; bracts small, linear. Calyx cup-shaped, truncate to subtruncate, glabrous. Corolla purple, ca. 3 mm. Stamens ca. 5 mm; anthers oblong. Ovary sparsely gray stellate tomentose. Fruit globose, ca. 2 mm in diam. Fl. and fr. Jun-Nov.

• Mixed forests on mountain slopes; 500–1000 m. S and W Sichuan, NW Yunnan.

30. *Callicarpa erythrosticta* Merrill & Chun, Sunyatsenia 5: 178. 1940.

红腺紫珠 hong xian zi zhu

Shrubs ca. 2 m tall. Branchlets grayish, terete, with stellate hairs, brownish red glandular. Petiole 2–5 mm; leaf blade ovate-oblong to elliptic-lanceolate, 4–8 × 1–2.5 cm, abaxially with stellate hairs on midvein and densely red-brown glandular, adaxially glabrous, base cuneate, margin serrate above middle, apex caudate-acuminate, veins 5–8 pairs. Cymes ca. 1 cm across; peduncle ca. 5 mm; bracts linear. Calyx ca. 1 mm, truncate, densely brownish red glandular. Corolla pinkish to nearly white, ca. 2.5 mm. Stamens long exerted. Ovary glabrous, brownish red glandular. Fruit globose, ca. 2 mm in diam., sparsely brownish red glandular. Fl. spring.

• Mixed forests on mountain slopes; 400–1400 m. Hainan.

31. *Callicarpa hungtaii* Pei & S. L. Chen in W. Z. Fang, Fl. Reipubl. Popularis Sin. 65(1): 60. 1982.

厚萼紫珠 hou e zi zhu

Premna angustifolia Chang (1960), not *Callicarpa angustifolia* King & Gamble (1908).

Subshrubs to shrubs. Branchlets stellate tomentose when young. Petiole ca. 2 mm; leaf blade oblong-lanceolate, 3–6 × 1–1.6 cm, subleathery, abaxially greenish with brownish red glands, adaxially dark green and glabrous except on midvein, base cuneate, margin sparsely serrate above middle, apex caudate-acuminate, veins 5 or 6 pairs, midvein and veins conspicuous on both surfaces. Cymes ca. 2 cm across, 1–7-flowered; peduncle 3–5 mm. Pedicel ca. 2 mm, minutely stellate tomentose. Calyx outside reddish brown glandular. Fruit subglobose, ca. 3 mm in diam.

• Thickets on mountain slopes; 300–600 m. Guangdong (Yangchun Xian).

Similar to *Callicarpa erythrosticta* but differs in having subleathery leaf blades and calyces thickened in fruit.

32. *Callicarpa longipes* Dunn, J. Linn. Soc., Bot. 38: 363. 1908.

长柄紫珠 chang bing zi zhu

Callicarpa longipes var. *laui* Moldenke.

Shrubs 2–3 m tall. Stems with short stellate hairs plus fewer, simple gland-tipped hairs. Branchlets brownish pilose. Petiole 5–8 mm; leaf blade elliptic to ovate-lanceolate, 6–13 × 2–7 cm, abaxially yellow glandular, base cordate and slightly oblique, margin triangular serrate, apex acute to caudate, veins 8–10 pairs. Cymes ca. 3 cm across, pilose; peduncle 1.5–3 cm. Calyx campanulate, 1–2 mm; teeth 4, acute. Corolla reddish, ca. 4 mm, pilose. Stamens 2 × as long as corolla tube; anthers ovate, ca. 1 mm. Ovary glabrous. Fruit purple, globose, 1.5–2 mm in diam. Fl. Jun-Jul, fr. Aug-Dec.

• Thickets, mixed forests; 300–500 m. Anhui, Fujian, Guangdong, Jiangxi.

33. *Callicarpa basitruncata* Merrill ex Moldenke, *Phytologia* 3: 406. 1951.

平基紫珠 ping ji zi zhu

Shrubs. Branches and branchlets obtusely 4-angled, stellate puberulent when young, subglabrescent; twigs brown, slender, sparsely stellate tomentellous with short gray hairs. Petiole 1–2 mm; leaf blade oblong-oblongeolate, 6–12.5 × 1–2.5 cm, abaxially stellate tomentellous on main veins, adaxially glabrous except for a few brown peltate glands near base, dark yellow glandular, base truncate to shallowly cordate, margin very shallowly crenulate to subentire and minutely revolute, apex subacuminate. Cymes few flowered; peduncle slender, ca. 5 mm. Calyx ca. 1 × 1 mm, obscurely 4-dentate to almost truncate, very sparsely stellate puberulent to glabrescent, very sparsely glandular. Corolla white; tube ca. 2 mm, very minutely papillate, glandular. Stamens exerted.

• Bank by a small grove, 400 m. Hainan.

Known only from the type collection of which only a photograph of the holotype has been seen by the authors.

34. *Callicarpa rubella* Lindley, *Bot. Reg.* 11: t. 883. 1825.

红紫珠 hong zi zhu

Shrubs ca. 2 m tall. Petiole very short to leaf subsessile; leaf blade lanceolate, oblanceolate, obovate-elliptic, or ovate, (4.5–)8–14(–21) × (1.1–)2–8(–10) cm, base cordate and sometimes oblique, margin serrulate, irregularly serrate, or serrate, apex acuminate to caudate; veins 6–10 pairs, midvein, lateral veins, and reticulate veins elevated on both surfaces. Cymes 2–4 cm across; peduncle ca. (0.6–)1–3 cm; bracts small. Calyx subtruncate to slightly dentate with obtusely triangular teeth. Corolla purple, greenish, or white, ca. 3 mm. Fruit purple, (1–)2 mm in diam. Fl. May–Jul, fr. Jul–Nov.

100–3500 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang [Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

- 1a. Branchlets, cymes, and abaxial leaf surfaces
pubescent with stellate hairs 34a. var. *rubella*
1b. Branchlets, cymes, and leaves glabrous
..... 34b. var. *subglabra*

34a. *Callicarpa rubella* var. *rubella*

红紫珠 hong zi zhu

Callicarpa dielsii (H. Léveillé) P'ei; *C. panduriformis* H. Léveillé; *C. rubella* var. *dielsii* (H. Léveillé) H. L. Li; *C. rubella* var. *hemsleyana* Diels; *C. tenuiflora* Champion; *Viburnum dielsii* H. Léveillé.

Branchlets with brown stellate and glandular hairs. Leaf blade abaxially with stellate, simple, and glandular hairs and yellow glandular, adaxially with glandular hairs. Cymes with brown stellate and glandular hairs. Calyx with stellate hairs, glandular hairs, and yellow glands. Corolla puberulent, yellow glandular. Fl. May–Jul, fr. Jul–Nov.

Thickets or mixed forests on mountain slopes or in valleys; 100–3500 m. Anhui, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang [Indonesia, Malaysia, Myanmar, Thailand, Vietnam].

34b. *Callicarpa rubella* var. *subglabra* (P'ei) Chang, *Acta Phytotax. Sin.* 1: 297. 1951.

秃红紫珠 tu hong zi zhu

Callicarpa rubella var. *hemsleyana* Diels f. *subglabra* P'ei, *Mem. Sci. Soc. China* 1(3): 41. 1932.

Branchlets, leaves, inflorescences, calyces, and corollas glabrous. Fl. Jun–Jul, fr. Jul–Sep.

• Thickets or forests on mountain slopes or along stream banks; 100–1200 m. Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Zhejiang.

35. *Callicarpa cathayana* Chang, *Acta Phytotax. Sin.* 1: 305. 1951.

华紫珠 hua zi zhu

Shrubs 1.5–3 m tall. Branchlets slender, slightly stellate tomentose when young, glabrescent. Petiole 4–8 mm; leaf blade elliptic to ovate, 4–8 × 1.5–3 cm, subglabrous, red glandular, base narrowly cuneate, margin serrulate, apex acuminate, veins 5–7 pairs. Cymes slender, ca. 1.5 cm across, sparsely stellate tomentose; peduncle 4–7 mm; bracts small. Calyx cup-shaped, truncate to minutely 4-dentate, teeth obtusely triangular, stellate tomentose, red glandular. Corolla purple, sparsely stellate tomentose, red glandular. Filaments equal or slightly longer than corolla; anthers ca. 1.2 mm. Ovary glabrous. Style slightly longer than stamens. Fruit purple, globose, ca. 2 mm in diam. Fl. May–Jul, fr. Aug–Nov.

• Mixed forests on mountain slopes or in valleys; below 1200 m. Anhui, Fujian, Guangdong, Guangxi, Henan, Hubei, Jiangsu, Jiangxi, Yunnan, Zhejiang.

36. *Callicarpa dentosa* (Chang) W. Z. Fang, *Fl. Reipubl. Popularis Sin.* 65(1): 66. 1982.

多齿紫珠 duo chi zi zhu

Callicarpa brevipes (Benth) Hance var. *dentosa* Chang, *Acta Phytotax. Sin.* 1: 300. 1951.

Shrubs. Branchlets purplish brown with stellate hairs when young, becoming grayish brown and glabrous. Petiole ca. 4 mm; leaf blade elliptic to oblong-lanceolate, 16–25 × 5–7 cm, abaxially stellate tomentose on veins and densely purple glandular, adaxially glabrous except midvein sparsely puberulent, base cuneate, margin serrulate, apex acute, veins 8 or 9 pairs. Cymes dense, ca. 1 cm across; peduncle shorter than petioles; bracts small. Pedicel ca. 1.5 mm. Calyx cup-shaped, truncate, subglabrous, purple glandular. Corolla white, 3.5 mm in diam., subglabrous, purple glandular. Filaments shorter than corolla tube. Fl. Jun–Jul, fr. Jul–Sep.

• Dense forests on mountain slopes or along stream banks; 400–1000 m. N Guangdong.

Related to *Callicarpa brevipes* but differs in elliptic to oblong-lanceolate leaf blades and densely purple glandular calyces and corollas.

37. *Callicarpa collina* Diels, *Notizbl. Bot. Gart. Berlin-Dahlem* 9: 1030. 1926.

丘陵紫珠 qiu ling zi zhu

Callicarpa brevipes (Benth) Hance f. *yingtakensis* P'ei.

Shrubs 1–2 m tall. Branchlets terete, yellowish brown stellate tomentose. Petiole ca. 5 mm; leaf blade oblanceolate to elliptic-lanceolate, 12–19(–25) × 3–6(–8) cm, abaxially with sparse yellowish brown stellate hairs denser along midvein and obscurely small yellow glands, adaxially glabrous, base cuneate to broadly cuneate, margin sparsely serrulate, apex

acuminate to acute. Cymes dense, 1–1.5 cm across; peduncle ca. 5 mm, sparsely yellowish brown stellate tomentose; bracts small. Pedicel ca. 1.5 mm, glabrous. Calyx ca. 1.2 mm, subtruncate, obscurely dentate, glabrous. Corolla white or pinkish, ca. 3 mm; lobes 4, apex obtuse to subrounded. Filaments shorter than corolla tube; anthers exserted. Ovary glabrous. Fruit globose, ca. 2 mm in diam. Fl. May–Jul, fr. Jun–Aug.

- Mountain slopes; 700–1000 m. Guangdong, S Jiangxi.

38. *Callicarpa tingwuensis* Chang, Acta Phytotax. Sin. 1: 302. 1951.

鼎湖紫珠 *ding hu zi zhu*

Shrubs ca. 1 m tall. Branchlets yellowish brown stellate tomentose. Petiole 1–1.5 cm, stellate tomentose; leaf blade elliptic to oblong, 14–20 × 5–8.5 cm, abaxially stellate tomentose, adaxially pubescent along veins, base broadly cuneate to subrounded and slightly oblique, margin serrulate, apex acuminate, veins 10–12 pairs. Cymes 1.5–2.5 cm across, yellowish brown stellate tomentose; peduncle ca. 5 mm; bracts small. Pedicel ca. 1 mm. Calyx ca. 1 mm, truncate, outside stellate tomentose. Corolla white, 3–4 mm, slightly puberulent. Filaments shorter than corolla; anthers oblong, ca. 1.5 mm. Ovary densely stellate tomentose. Style ca. 5 mm. Fruit ca. 3 mm in diam., stellate tomentose. Fl. May, fr. Sep–Oct.

- Mixed forests on mountain slopes, 400–500 m. Guangdong (Dinghu Shan).

Similar to *Callicarpa brevipes* and *C. collina* but differs from both in having calyces, ovaries, and fruit stellate tomentose and corollas slightly puberulent.

39. *Callicarpa randaiensis* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 222. 1911.

峦大紫珠 *luan da zi zhu*

Shrubs. Petioles and inflorescences stellate tomentose. Branchlets yellowish brown. Petiole 2–5 mm; leaf blade lanceolate, 4–9 × 1–2(–3) cm, yellow glandular, abaxially stellate tomentose on veins, adaxially sparsely puberulent, base cuneate, margin serrate, apex acuminate, veins 6–9 pairs. Cymes delicate, ca. 1.5 cm across; peduncle ca. 8 mm; bracts small, linear. Calyx cup-shaped, teeth obtusely triangular, glabrous, yellow glandular. Corolla ca. 4 mm, glabrous, yellow glandular. Filaments slightly longer than or equal to corolla; anthers oblong. Ovary glabrous, yellow glandular. Style slightly longer than stamens; stigma emarginate. Fruit globose, ca. 2 mm in diam. Fl. Jul, fr. Jul–Dec.

- Mixed forests on mountain slopes; 1000–2500 m. Taiwan.

40. *Callicarpa brevipes* (Benth) Hance, Ann. Sci. Nat. Bot., sér. 5, 5: 233. 1886.

短柄紫珠 *duan bing zi zhu*

Shrubs 1–2.5 m tall. Branchlets obscurely 4-angled, yellow-brown stellate pubescent when young, glabrescent. Petiole ca. 5 mm; leaf blade narrowly lanceolate, lanceolate, obovate-elliptic, or broadly ovate, 6–24 × 1–6 cm, abaxially stellate pubescent on veins and yellow glandular, adaxially glabrous, margin subentire to sparsely serrulate along apical part, apex acuminate or acute, veins 9–12 pairs. Cymes ca. 1.5 cm across; peduncle slender, subequal to slightly longer than petioles. Flowers small, usually pendent. Calyx cup-shaped, subtruncate to minutely 4-dentate. Corolla white, ca. 3.5 mm, glabrous. Filaments nearly as long as corolla; anthers oblong,

densely yellow glandular. Ovary glabrous, glandular. Style slightly longer than stamens. Fruit red to purple, 2–9 mm in diam. Fl. Apr–Jun, fr. Jul–Nov.

300–1400 m. Guangdong, Guangxi, Hainan, S Zhejiang [Vietnam].

- 1a. Leaf blade narrowly lanceolate to lanceolate, apex acuminate 40a. var. *brevipes*
- 1b. Leaf blade obovate-elliptic to broadly ovate, apex acute 40b. var. *obovata*

40a. *Callicarpa brevipes* var. *brevipes*

短柄紫珠 *duan bing zi zhu*

Callicarpa longifolia Lamarck var. *brevipes* Benth, Fl. Hongk. 270. 1861; *C. brevipes* f. *serrulata* P'ei.

Leaf blade narrowly lanceolate to lanceolate, 9–24 × 1–5 cm, base obtuse to rarely cuneate or slightly cordate, apex acuminate. Fl. Apr–Jun, fr. Jul–Oct.

Mixed forests on mountain slopes; 600–1400 m. Guangdong, Guangxi, S Zhejiang [Vietnam].

40b. *Callicarpa brevipes* var. *obovata* Chang, Acta Phyto-tax. Sin. 1: 301. 1951.

倒卵叶短柄紫珠 *dao luan ye duan bing zi zhu*

Leaf blade obovate-elliptic to broadly ovate, 6–16 × 3.5–6 cm, base subcordate to rounded, apex acute. Fl. Apr–May, fr. Oct–Nov.

- Mixed forests; 300–600 m. Guangdong, Hainan.

41. *Callicarpa remotiserrulata* Hayata, J. Coll. Sci. Imp. Univ. Tokyo 30(1): 223. 1911.

疏齿紫珠 *shu chi zi zhu*

Callicarpa remotiflora Wei-Fang Lin & Jen-Li Wang.

Shrubs. Branchlets stellate pubescent when young, glabrescent. Petiole robust, 6–8 mm; leaf blade oblong-lanceolate to oblong, 6–10 × 2–3 cm, subleathery, shiny, glabrous and glandular, base cuneate, margin sparsely serrulate, apex acuminate; veins 6–10 pairs, abaxially slightly elevated. Cymes ca. 1.5 cm across; peduncle ca. 1.5 cm in fruit. Calyx cup-shaped, subtruncate to minutely 4-dentate, teeth obtusely triangular. Corolla white, ca. 3.5 mm. Anthers elliptic. Fruit globose, ca. 2.5 mm in diam., glabrous. Fr. Dec.

- Mountain slopes; 300–800 m. S Taiwan.

42. *Callicarpa japonica* Thunberg in Murray, Syst. Veg. ed. 14, 153. 1784.

日本紫珠 *ri ben zi zhu*

Shrubs ca. 2 m tall. Branchlets terete, glabrous. Leaf blade elliptic, ovate, or obovate, 7–18 × 4–8 cm, glabrous, base cuneate, margin serrulate above middle, apex bluntly caudate-acuminate to acute. Cymes delicate, ca. 2 cm across; peduncle 6–10 mm. Calyx cup-shaped, teeth obtusely triangular. Corolla white or purplish, ca. 3 mm, glabrous. Filaments equal or slightly longer than corolla tube; anthers ca. 1.8 mm, exserted. Fruit globose, ca. 2.5 mm in diam. Fl. Jun–Jul, fr. Jul–Oct.

200–900 m. Anhui, Guizhou, Hebei, W Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shandong, E Sichuan, Taiwan, Zhejiang [Japan, Korea].

- 1a. Peduncle equal or longer than petioles

..... 42a. var. *japonica*
1b. Peduncle shorter than petioles 42b. var. *luxurians*

42a. *Callicarpa japonica* var. *japonica*

日本紫珠 ri ben zi zhu

Callicarpa japonica f. *kuruninsularis* Masamune; *C. taquetii* H. Léveillé.

Petiole ca. 6 mm; leaf blade 7–12 × 4–6 cm. Fl. Jun-Jul, fr. Aug-Oct.

Mixed forests on mountain slopes or in valleys; 200–900 m. Anhui, Guizhou, Hebei, W Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shandong, E Sichuan, Taiwan, Zhejiang [Japan, Korea].

42b. *Callicarpa japonica* var. *luxurians* Rehder in Sargent, Pl. Wilson. 3: 369. 1916.

朝鲜紫珠 chao xian zi zhu

Callicarpa australis Koidzumi.

Petiole 1.5–2 cm; leaf blade 12–18 × 6–8 cm. Peduncle shorter than petioles. Flowers smaller than in var. *japonica*. Fl. Jun, fr. Jul-Oct.

Sparse forests; 200–400 m. Taiwan (Lanyu Dao) [Japan, Korea].

43. *Callicarpa membranacea* Chang, Acta Phytotax. Sin. 1: 306. 1951.

窄叶紫珠 zhai ye zi zhu

Callicarpa japonica var. *angustata* Rehder.

Shrubs ca. 2 m tall. Petiole less than 5 mm; leaf blade purplish green, lanceolate to oblanceolate, 6–10 × 2–3(–4) cm, papery, often glabrous, obscurely glandular, margin serrate above middle, veins 6–8 pairs. Cymes ca. 1.5 cm across; peduncle less than 6 mm. Calyx subtruncate. Corolla ca. 3.5 mm. Fruit ca. 3 mm in diam.

• Forest thickets on mountain slopes or in valleys; below 1300 m. Anhui, Guangdong, Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, E Sichuan, Zhejiang.

44. *Callicarpa kwangtungensis* Chun, Sunyatsenia 1: 302. 1934.

广东紫珠 guang dong zi zhu

Shrubs ca. 2 m tall. Branchlets purplish, sparsely stellate tomentose when young, becoming yellowish gray and glabrous. Petiole 5–8 mm; leaf blade narrowly linear-lanceolate, elliptic-lanceolate, or lanceolate, 15–26 × 3–5 cm, base cuneate, usually glabrous, abaxially densely small yellow glandular, margin serrulate above middle, apex acuminate; veins 12–15 pairs, glabrous. Cymes 3–5-branched, many flowered, 2–3 cm across, sparsely stellate tomentose; peduncle 5–8 mm. Calyx with obtusely triangular teeth, slightly stellate tomentose when young, glabrescent. Corolla white or purplish, ca. 4 mm, slightly stellate tomentose. Filaments shorter than or equal to corolla; anthers oblong. Ovary glabrous, yellow glandular. Fruit ca. 3 mm in diam., yellow glandular. Fl. Jun-Jul, fr. Aug-Oct.

• Mixed forests; 300–1600 m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Yunnan, Zhejiang.

Similar to *Callicarpa membranacea* but differs in having longer leaf blades with abaxial small dense yellow glands and having larger cymes.

45. *Callicarpa anisophylla* C. Y. Wu ex W. Z. Fang in W. Z. Fang, Fl. Reipubl. Popularis Sin. 65(1): 210. 1982.

异叶紫珠 yi ye zi zhu

Subshrubs to shrubs, 30–100 cm tall. Branchlets terete, sparsely yellowish gray stellate tomentose. Petiole less than 5 mm; leaf blade linear-lanceolate to narrowly lanceolate, usually oblique, 10–33 × 1.5–4.5 cm, membranous, abaxially glabrous and densely yellow glandular, adaxially pubescent especially on midvein, base narrowly cuneate, margin subterete to loosely serrulate, apex attenuate-acuminate, veins 9–12 pairs. Cymes small, 5–10 mm across; peduncle ca. 3 mm, stellate tomentose, yellow glandular; bracts lanceolate. Pedicel ca. 2 mm. Calyx cup-shaped, ca. 1.2 mm, teeth obtusely triangular. Corolla white, ca. 3 mm. Filaments shorter than corolla tube; anthers exerted, elliptic, ca. 1.5 mm, yellow glandular. Fruit elliptic to subglobose, ca. 2 mm in diam. Fl. and fr. Jun-Aug.

• Dense forests on mountain slopes; 900–1300 m. Guangxi, Guizhou.

46. *Callicarpa lingii* Merrill, J. Arnold Arbor. 8: 16. 1927.

光叶紫珠 guang ye zi zhu

Shrubs ca. 1.5 m tall. Branchlets purplish brown, 4-angled, sparsely stellate pubescent when young, becoming terete, grayish brown, and glabrous. Petiole very short to leaf subsessile; leaf blade narrowly elliptic to obovate-elliptic, narrowing below middle, 13–18 × 3–5 cm, glabrous or adaxially puberulent, abaxially densely small yellow glandular, base subcordate, margin subterete to serrulate, apex acuminate to acute, veins 10–12 pairs. Cymes slender, ca. 2.5 cm across, yellowish brown stellate pubescent; peduncle 4–8 mm; bracts linear-lanceolate. Calyx cup-shaped, ca. 2 mm, minutely 4-dentate to subtruncate, glabrous or sparsely stellate pubescent. Corolla purple, ca. 4 mm, subglabrous. Filaments shorter than corolla; anthers ca. 1.5 mm, oblong. Style slightly longer than stamens. Fruit obovate to ovate, ca. 2.5 mm in diam., yellow glandular. Fl. Jun, fr. Jul-Oct.

• Mountain slopes; 300 m. S Anhui, Jiangxi, Zhejiang.

47. *Callicarpa oligantha* Merrill, Philipp. J. Sci. 13: 155. 1918.

罗浮紫珠 luo fu zi zhu

Shrubs 2–3 m tall, slender. Branchlets sparsely stellate pilose when young, becoming terete, grayish, and glabrous or subglabrous. Petiole ca. 2 mm; leaf blade narrowly lanceolate, 6–12 × 0.8–1.5 cm, papery, abaxially glabrous except stellate pilose along midvein when young and grayish glandular, adaxially dark brownish green, smooth, shiny, glabrous, and without glands, base cuneate, margin distinctly serrate along apical 2/3, apex acuminate to acute, veins 7–9 pairs. Cymes 2- or 3-flowered; peduncle obsolete to ca. 2 mm. Fruiting pedicel more than 4 mm. Fruit dark brown when dry, subglobose to globose, 3–3.5 mm in diam., glabrous.

• Thickets along stream banks; 900 m. Guangdong (Loufu Shan).

Related to *Callicarpa membranacea* and *C. brevipes* but differs in having inflorescences simple with only 2 or 3 flowers and longer pedicels.

48. *Callicarpa peichieniana* Chun & S. L. Chen in W. Z. Fang, Fl. Reipubl. Popularis Sin. 65(1): 78. 1982.

钩毛紫珠 gou mao zi zhu

Premna peii Chun ex Chang (1960), not *Callicarpa peii* Chang (1951).

Shrubs ca. 2 m tall, pubescent with strongly curved stem hairs. Branchlets terete, slender, densely strigose yellow glandular. Petiole very short to leaf sessile; leaf blade ovate-elliptic to ovate, 2.5–6 × 1–3 cm, glabrous and densely yellow glandular, base cuneate to subrounded, margin serrulate above middle, apex acuminate to caudate-acuminate; veins 4 or 5 pairs, reticulate veins obscure. Cymes simple, rarely dichotomous, (1–)3(–7)-flowered; peduncle capillary, 1–2 cm;

bracts linear. Pedicel capillary, ca. 4 mm. Calyx cup-shaped, ca. 1.5 mm, truncate, yellow glandular. Filaments equal or slightly longer than corolla; anthers oblong. Ovary globose, glabrous, densely glandular. Style longer than stamens. Fruit purple, globose, ca. 4 mm in diam.; pyrenes 4. Fl. Jun-Jul, fr. Aug-Nov.

- Mixed forests; 200–700 m. Guangdong, Guangxi, Hunan.

Included in *Callicarpa* because of its axillary inflorescences, actinomorphic corollas, 4 equal stamens, capitate stigmas, etc.

7. HYMENOPYRAMIS Wallich ex Griffith in McClelland, Calcutta J. Nat. Hist. 3: 365. 1842.

膜萼藤属 mo e teng shu

Shrubs, climbing, or small trees. Leaves opposite. Inflorescences terminal or axillary irregular thyrses. Calyx minutely 4-dentate in flower. Corolla nearly funnelform; lobes 4, unequal, spreading. Stamens 4, inserted at corolla throat; anthers ovate, dehiscent by longitudinal slits. Ovary 2-locular; ovules 2 per locule. Style exerted; stigma 2-cleft. Fruiting calyx tube greatly inflated, bladderlike, translucently membranous, with reticulate veins, teeth remaining minute. Fruit a globose schizocarp.

About six species: chiefly in SE Asia, one species in China.

1. *Hymenopyramis cana* Craib, Bull. Misc. Inform. Kew 1922: 240. 1922.

膜萼藤 mo e teng

Shrubs, straggling to climbing; most parts with a mixture of short gland-tipped hairs and longer slender whitish hairs. Branchlets 4-angled, lenticellate. Petiole 6–10 mm; leaf blade elliptic-ovate to ovate, rarely lanceolate or obovate, 9–16 × 5.5–7.5 cm, papery to subleathery, abaxially grayish when dry and tomentose, adaxially brown when dry and pubescent on

midvein, base cuneate to rounded-cuneate, margin entire, apex acuminate, veins abaxially prominent. Inflorescences terminal, densely clustered rounded thyrses; basal peduncles over 1 cm. Flowers minute. Calyx ca. 1.3 mm at anthesis, densely canescent. Corolla tube ca. 1 mm, lobes ca. 2 mm. Fruiting calyx pale brown, ca. 1 cm. Fruit ca. 4 mm, minutely hirsute.

Mountain slopes; 100–500 m. Hainan (Dongang Xian and Changjiang Xian) [Thailand].

8. TECTONA Linnaeus f., Suppl. Pl. 151. 1781 (publ. 1782), nom. cons.

柚木属 you mu shu

Trees, tall, deciduous. Indumentum stellate. Leaves large, opposite or whorled, petiolate. Panicles terminal, with many dichotomous cymes; bracts small, narrow, early deciduous. Calyx campanulate, tube short, lobes spreading. Stamens 5 or 6, inserted on apical part of tube, exerted; anthers dehiscent by longitudinal slits. Ovary 4-locular; ovule 1 per locule. Stigma 2-cleft. Fruit enclosed in enlarged persistent calyx, endocarp bony, exocarp thin. Seeds oblong.

About three species: mainly in India, Malaysia, Myanmar, and Philippines; one species introduced and sometimes naturalized in tropical and subtropical China.

1. *Tectona grandis* Linnaeus f., Suppl. Pl. 151. 1781. (publ. 1782).

柚木 you mu

Trees to 40 m tall. Branchlets gray to grayish brown, 4-angled, yellowish to grayish brown stellate tomentose. Petiole robust, 2–4 cm; leaf blade ovate-elliptic to ovate, 15–45(–70) × 8–23(–37) cm, papery, abaxially densely grayish brown to yellowish brown minutely stellate tomentose, adaxially scabrous and puberulent along veins, base cuneate and de-current, margin entire, apex acuminate to obtuse, veins

7–12 pairs. Panicles 25–40 × 30 cm. Flowers fragrant. Calyx tube 2.5–3 mm, with white stellate hairs. Corolla white; tube 2.5–3 mm, outside puberulent glandular; lobes ca. 2 mm, obtuse. Ovary strigose. Style 3–4 mm. Fruit globose, 1.2–1.8 cm in diam., minutely tomentose. Fl. Jun-Aug, fr. Sep-Dec.

Cultivated and sometimes naturalized; below 900 m. Fujian, Guangdong, Guangxi, Taiwan, Yunnan [native to India, Indonesia, Malaysia, and Myanmar].

Medicinal, timber.

9. PREMNA Linnaeus, Mant. Pl. 154. 1771, nom. cons.

豆腐柴属 dou fu chai shu

Pygmaepremna Merrill.

Trees, shrubs, or subshrubs, erect or rarely climbing. Branches usually terete, usually with round or elliptic yellowish glandular lenticels. Leaves simple, opposite, margin entire or 3–5-crenate. Inflorescences terminal trichotomous panicles, leaf opposed cymes, clusters, paniculate corymbs, or spikelike thyrses. Flowers small. Calyx ± cup-shaped or campanulate, truncate, sinuately dentate, or rarely long dentate, teeth equal or clearly 2-lipped. Corolla with a short tube; lobes 4 or obscurely 5, spreading, subequal to clearly 2-lipped. Stamens 4, often didynamous, shorter than corolla or sometimes slightly exerted. Ovary (2- or

4-locular; ovules 1 (or 2) per locule, pendulous or laterally attached. Style capillary; stigma 2-cleft. Fruit a small drupe, usually with a 4-locular pyrene.

About 200 species: Old World tropics and subtropics, 46 species in China.

- 1a. Suffrutescent herbs with a woody rhizome; ovary 2-locular 46. *P. herbacea*
- 1b. Trees or shrubs; ovary 4-locular.
- 2a. Inflorescences spikelike or racemelike thyrses; calyx lips entire or upper lip slightly emarginate.
- 3a. Inflorescences racemelike thyrses with pedunculate cymes 43. *P. racemosa*
- 3b. Inflorescences spikelike thyrses with sessile cymes.
- 4a. Shrubs; leaf blade papery; bracts ca. 10 mm 44. *P. interrupta*
- 4b. Trees; leaf blade subleathery; bracts ca. 5 mm 45. *P. bracteata*
- 2b. Inflorescences compound cymes; calyx not 2-lipped or if 2-lipped then lips dentate or lobed.
- 5a. Calyx 4-dentate or subtruncate, not indistinctly 2-lipped.
- 6a. Leaf blade leathery or thickly papery, both surfaces glabrous.
- 7a. Erect trees or shrubs; leaf blade thickly papery, veins elevated on both surfaces 37. *P. scoriarum*
- 7b. Plants climbing; leaf blade leathery, veins abaxially obscure or only slightly distinct 38. *P. scandens*
- 6b. Leaf blade papery or submembranous, pubescent.
- 8a. Branches gray-yellow; leaf blade base rounded or truncate 34. *P. fohaiensis*
- 8b. Branches brown to black-brown; leaf blade base cuneate to subrounded.
- 9a. Leaf blade broadly ovate to ovate-lanceolate, papery 35. *P. szemaoensis*
- 9b. Leaf blade narrowly elliptic to elliptic, submembranous 36. *P. paisehensis*
- 5b. Calyx 5-dentate, 5-lobed, or distinctly 2-lipped.
- 10a. Calyx distinctly 2-lipped.
- 11a. Calyx lower lip emarginate, upper lip with 3 minute emergences 42. *P. laevigata*
- 11b. Calyx lower lip subtire to shortly 3-lobed, upper lip emarginate or 2-dentate.
- 12a. Calyx 4–5 mm.
- 13a. Base of leaf blade cuneate to decurrent 8. *P. confinis*
- 13b. Base of leaf blade rounded to somewhat cordate 39. *P. odorata*
- 12b. Calyx 1.5–3 mm.
- 14a. Lower lip of calyx subtire to slightly 2-dentate; corolla yellow or white 41. *P. hainanensis*
- 14b. Lower lip of calyx subtire to 3-dentate; corolla greenish yellow 40. *P. serratifolia*
- 10b. Calyx not 2-lipped, actinomorphic (calyx nearly 2-lipped in *P. confinis*).
- 15a. Cymes in a lax conical panicle.
- 16a. Branchlets, leaves, and petioles with stellate hairs 1. *P. pyramidata*
- 16b. Branchlets, leaves, and petioles without stellate hairs.
- 17a. Leaf blade base narrow cuneate or decurrent.
- 18a. Evergreen; leaf blade leathery, adaxially dark yellow glandular; calyx nearly 2-lipped 8. *P. confinis*
- 18b. Deciduous; leaf blade papery, adaxially without glands; calyx equally 5-dentate.
- 19a. Leaf blade margin serrate or entire; corolla ca. 7–9 mm 3. *P. microphylla*
- 19b. Leaf blade margin entire or 3–5-crenate; corolla 3–5 mm 4. *P. ligustroides*
- 17b. Leaf blade base cuneate or subcordate.
- 20a. Inflorescence branches not scorpioid; flowers usually persistent.
- 21a. Leaf blade pubescent, without glands or with minute inconspicuous glands; branchlets horizontal 2. *P. puberula*
- 21b. Leaf blade subglabrous on both surfaces, abaxially brownish red glandular; branches ascending 5. *P. sunyiensis*
- 20b. Inflorescence branches often scorpioid; flowers usually deciduous but pedicel usually persistent.
- 22a. Shrubs, usually climbing; panicles 2–5 cm wide 9. *P. fordii*
- 22b. Shrubs or trees, usually erect; panicles 8–15 cm wide.
- 23a. Leaf blade 9–15 × 5–9 cm; petiole 2–5 cm; branchlets puberulent when young; panicles always conical 6. *P. cavaleriei*
- 23b. Leaf blade 5–9 × 3–4 cm; petiole (0.1–)0.2–0.3 cm; branchlets tomentellous when young; panicles often rounded 7. *P. chevalieri*
- 15b. Cymes in a lax flat-topped corymb or dense capitulum.
- 24a. Cymes in a lax flat-topped corymb.
- 25a. Leaf blade densely pubescent or pilose on 1 or both surfaces.
- 26a. Flowers dusty yellow 14. *P. latifolia*
- 26b. Flowers white to greenish or yellowish green.
- 27a. Leaf pairs equal 18. *P. tapintzeana*
- 27b. Leaf pairs unequal.
- 28a. Leaves, branchlets, and petioles densely villous 16. *P. fulva*

- 28b. Leaves, branchlets, and petioles pilose.
- 29a. Branchlets with white lenticels; inflorescences 6–17 cm across; stamens didynamous, exerted 15. *P. flavescens*
- 29b. Branchlets with yellow lenticels; inflorescences less than 6 cm across; stamens subequal, included 19. *P. crassa*
- 25b. Leaf blade adaxially glabrous or subglabrous except for pubescent veins.
- 30a. Leaf blade leathery 12. *P. maclurei*
- 30b. Leaf blade papery or membranous.
- 31a. Leaf blade membranous, abaxially sparsely white or yellow glandular; stamens subequal; ovary apex white glandular 17. *P. straminicaulis*
- 31b. Leaf blade papery, abaxially without glands; stamens didynamous; ovary glabrous, without glands.
- 32a. Erect shrubs or trees; leaves black when dry.
- 33a. Leaf blade 3–4(–5) cm wide; panicles to 25 cm 7. *P. chevalieri*
- 33b. Leaf blade 5–6 cm wide; panicles 3–7 cm 13. *P. octonervia*
- 32b. Climbing shrubs; leaves dark green, brownish, or dark brown when dry.
- 34a. Leaf blade ovate, oblong, or rarely obovate, dark green or brownish when dry; bracts lanceolate 11. *P. puerensis*
- 34b. Leaf blade broadly ovate to elliptic, dark brown when dry; bracts awl-shaped 10. *P. subscandens*
- 24b. Cymes in a dense capitulum.
- 35a. Leaf blade and calyx red, purple-red, or orange glandular.
- 36a. Leaf blade and calyx red or purple-red glandular; calyx lobes less than half the calyx.
- 37a. Leaf blade purple-red glandular on both surfaces; corolla violet to pinkish, 4.5–5 mm 20. *P. glandulosa*
- 37b. Leaf blade deep red glandular abaxially; corolla nearly orange, ca. 6 mm 21. *P. henryana*
- 36b. Leaf blade and calyx orange glandular; calyx lobes more than half the calyx.
- 38a. Calyx teeth linear-lanceolate; ovary pilose, apically white glandular; leaf blade 1.5 cm wide 22. *P. punicea*
- 38b. Calyx teeth narrowly triangular; ovary glabrous, without glands; leaf blade 2–4 cm wide 23. *P. rubroglandulosa*
- 35b. Leaf blade and calyx yellow glandular.
- 39a. Corolla white, yellow, to greenish.
- 40a. Leaf blade cordate 31. *P. velutina*
- 40b. Leaf blade ovate-lanceolate, to rounded.
- 41a. Corolla tube glabrous outside; ovary glabrous 29. *P. mekongensis*
- 41b. Corolla tube pubescent outside; ovary pubescent.
- 42a. Leaf blade broadly ovate to rounded; petiole ca. 3 mm 32. *P. tenii*
- 42b. Leaf blade ovate to ovate-oblong; petiole 4–10 mm 33. *P. subcapitata*
- 39b. Corolla pinkish, purple, rose, or rose red.
- 43a. Leaf blade abaxially densely pubescent 30. *P. yunnanensis*
- 43b. Leaf blade abaxially sparsely pubescent.
- 44a. Calyx equal to or shorter than fruit; corolla pinkish.
- 45a. Leaf blade 2–6 cm wide, ovate, base cordate; ovary glabrous; calyx shorter than fruit 24. *P. urticifolia*
- 45b. Leaf blade 0.3–1.1 cm wide, lanceolate to ovate-lanceolate, base cuneate to rounded; ovary sparsely pubescent; calyx as long as fruit 25. *P. parvilimba*
- 44b. Calyx longer than fruit; corolla purple, rose, or rose red.
- 46a. Ovary sparsely pubescent; calyx teeth linear to linear-lanceolate 28. *P. acutata*
- 46b. Ovary glabrous; calyx teeth lanceolate or triangular-lanceolate.
- 47a. Leaf blade 1.5–3.5 cm; petiole 4–5 mm; inflorescences 12-flowered 26. *P. steppicola*
- 47b. Leaf blade (2.5–)5–6 cm; petiole 1–2 mm; inflorescences 2–4(–6)-flowered 27. *P. oligantha*

1. *Premna pyramidata* Wallich ex Schauer in A. de Can-dolle, Prodr. 11: 633. 1847.

塔序豆腐柴 ta xu dou fu chai

Shrubs or small trees, ca. 6 m tall, erect. Branchlets with sparsely stellate hairs when young, glabrescent. Petiole 1.5–3.5 cm, 4-angled, with stellate hairs; leaf blade oblong, elliptic, or oblong-ovate, 7.5–15 × 4–7 cm, papery, with stellate hairs and yellow glands along veins, base broadly cuneate to rounded,

margin entire, apex acuminate to acute. Panicles 6–8 × 3.5–4 cm; peduncle 1.5–2.5 cm, with stellate hairs; bracts linear, less than 5 mm. Calyx campanulate, 5-dentate, outside stellate pubescent; teeth subequal, very short, obtusely triangular. Corolla slightly 2-lipped, lower lip usually 3-lobed, upper lip rounded to emarginate, outside with stellate hairs, villous in throat. Stamens 4, didynamous. Style 3–4 mm. Fruit globose, 3–5 mm in diam. Fl. and fr. Jul-Sep.

Thickets or forests on mountain slopes or along river banks; 300–600 m. Guangdong [India, Myanmar].

2. *Premna puberula* Pampanini, Nuovo Giorn. Bot. Ital., n.s., 17: 701. 1910.

狐臭柴 hu xiu chai

Shrubs or small trees, erect to slightly climbing. Branchlets green when young, becoming brown. Petiole (0.5–)1–2(–3.5) cm; leaf blade brown when dry, oblong-elliptic, ovate-elliptic, or ovate, 2.5–11 × 1.5–5.5 cm, papery, base cuneate, rounded, or slightly cordate, margin entire, apex caudate to acute, reticulate veins abaxially distinct. Panicles 4–14 × 2–9 cm, subglabrous to puberulent; bracts linear to lanceolate. Calyx cup-shaped, 1.5–2.5 mm, outside pubescent and yellow glandular; teeth 5, minute, triangular, ciliate. Corolla white, yellowish, orange, purple, or brown striate, 5–7 mm, tube 2.5–4 mm, slightly 2-lipped, villous in throat, lower lip 3-lobed; upper lip rounded to emarginate, outside densely glandular. Stamens slightly exerted; filaments glabrous. Ovary glabrous, apically glandular. Style shorter than stamens. Fruit purple-black, obovate. Fl. and fr. May-Sep.

• 700–1800 m. Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, S Shanxi, Sichuan, Yunnan.

The two Chinese varieties are rather poorly differentiated; however, there does appear to be a good correlation within the material available between flower color and flower size. Plants with white corollas have tubes less than 3 mm, whereas those with yellow corollas or yellow marked with brown have tubes 2.4–4 mm. This distinction merits further investigation.

- 1a. Branchlets pilose when young, glabrescent;
petioles glabrous 2a. var. *puberula*
1b. Branchlets densely pubescent; petioles densely
pubescent 2b. var. *bodinieri*

2a. *Premna puberula* var. *puberula*

狐臭柴 hu xiu chai

Premna martinii H. Léveillé; *P. subcordata* Nakai.

Branchlets pilose when young, glabrescent. Petiole glabrous; leaf blade subglabrous to pubescent on both surfaces. Fl. and fr. May-Aug.

• Mixed forests; 700–1800 m. Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hubei, Hunan, S Shanxi, Sichuan, Yunnan.

Medicinal.

2b. *Premna puberula* var. *bodinieri* (H. Léveillé) C. Y. Wu & S. Y. Pao, Fl. Yunnan. 1: 422. 1977.

毛狐臭柴 mao hu xiu chai

Premna bodinieri H. Léveillé, Repert. Spec. Nov. Regni Veg. 10: 440. 1912.

Young branchlets, both leaf surfaces, petioles, and inflorescences densely pubescent. Fl. and fr. May-Sep.

• Thickets on mountain slopes in calcareous soil; 700–1800 m. W Guangxi, Guizhou, SE Yunnan.

3. *Premna microphylla* Turczaninow, Bull. Soc. Imp. Nat-uralistes Moscou 36(3): 217. 1863.

豆腐柴 dou fu chai

Premna formosana Maximowicz; *P. japonica* Miquel; *P. microphylla* var. *glabra* Nakai.

Shrubs, erect. Branchlets pubescent when young, glabrescent. Leaves sessile or short petiolate with a winged petiole; leaf blade ovate-lanceolate, elliptic, ovate, or obovate, 3–13 × 1.5–6 cm, subglabrous to pubescent, base narrowly cuneate, margin entire or lobed to sometimes serrulate, apex long acuminate to acute. Inflorescences conical panicles. Calyx green and slightly purplish, cup-shaped, subequally 5-dentate, densely pubescent to subglabrous. Corolla yellowish, (6.5–)7(–9) mm, outside puberulent and glandular, inside pilose especially at throat. Fruit purple, globose to obovate. Fl. and fr. May-Oct.

Mixed forests on mountain slopes; 200–1000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan].

The species is extremely variable in leaf characters.

4. *Premna ligustroides* Hemsley, J. Linn. Soc., Bot. 26: 256. 1890.

臭黄荆 xiu huang jing

Shrubs 1–3 m tall. Branches many, slender, pubescent when young. Leaves subsessile to short petiolate; leaf blade lanceolate to ovate-lanceolate, 1.5–8 × 1–3 cm, pilose, abaxially purple-red glandular, base cuneate, margin entire or coarsely 3–5-dentate, apex acuminate to acute. Panicles 2–7.5 × 1–4.5 cm, pilose. Calyx cup-shaped, ca. 2 mm, nearly 2-lipped, 5-dentate, outside puberulent and glandular, inside sparsely glandular. Corolla yellow, 3–5 mm, nearly 2-lipped, 4-lobed; lower lip with 3 slightly unequal lobes and narrower than upper lip, both surfaces velvety and yellow glandular. Ovary glabrous, glandular. Style ca. 4 mm. Fruit globose, 2.5–5 × 2.5–4 mm, apically glandular. Fl. and fr. May-Jul.

• Mixed forests; 500–1000 m. Guizhou, Hubei, Jiangxi, Sichuan. Medicinal.

5. *Premna sunyiensis* P'ei, Mem. Sci. Soc. China 1(3): 84. 1932.

塘虱角 tang shi jiao

Shrubs 1–2 m tall, erect to climbing; branches, petioles, and inflorescences brownish and dark gray velvety. Petiole 0.6–2 cm; leaf blade ovate-lanceolate to ovate, 3–7.5 × 1–4.5 cm, papery, both surfaces subglabrous, abaxially brownish red glandular, base cuneate to subrounded, margin entire, apex acuminate; veins 3–5 pairs, abaxially prominent. Panicles 5–12 × 2.5–4 cm; bracts linear to linear-lanceolate, 2–6 mm, velvety. Calyx ca. 1.5 mm, slightly 5-dentate, outside brown glandular and pubescent when young but glabrescent, inside glabrous. Corolla yellow, tube ca. 7 mm; lower lip 3-lobed, middle lobe 1.5–2 mm, longer than lateral lobes; upper lip emarginate, white villous in throat. Anthers brown. Ovary glabrous, apically brown glandular. Fruit dark red, obovate, ca. 4 mm in diam., brown glandular. Fl. and fr. May-Oct.

• Mixed thickets on mountain slopes; 300–700 m. Guangdong (Ruyuan Xian).

Medicinal.

6. *Premna cavaleriei* H. Léveillé, Repert. Spec. Nov. Regni Veg. 10: 439. 1912.

黄药 huang yao

Clerodendrum elachistanthum Merrill ex H. L. Li.

Trees 4–9 m tall; bark pale gray. Branches red-brown, terete, with small elliptic lenticels, densely tomentellous when

young, glabrescent. Petiole 2–5 cm, sparsely velvety to subglabrous; leaf blade ovate to ovate-elliptic, 9–15 × (3.5–) 5–9 cm, thinly papery, both surfaces sparsely pubescent to subglabrous, abaxially obscurely glandular, base broadly cuneate, rounded, truncate, or subcordate, margin entire, apex acuminate to obtuse. Inflorescences paniculate cymes, 11–32 × 8–15 cm; branches trichotomous. Calyx campanulate, 1–2.5 mm, slightly 2-lipped, outside pubescent and obscurely glandular; teeth 5, obtuse, triangular. Corolla yellowish, slightly 2-lipped, 4-lobed, outside pubescent and glandular; tube 2–3 mm, villous in throat. Ovary glabrous, apically densely yellow glandular. Fruit ovate-globose, ca. 2 mm in diam. Fl. and fr. May-Jul.

• Mixed forests on mountain slopes; 800 m. Guangdong, Guangxi, Guizhou, E Hunan, W Jiangxi.

7. *Premna chevalieri* Dop, Bull. Soc. Bot. France 70: 445. 1923.

尖叶豆腐柴 jian ye dou fu chai

Premna acuminatissima Merrill.

Shrubs or trees, 2–5 m tall. Branchlets brown, terete, puberulent when young, glabrescent. Petiole slender, (1–) 2.5–3 mm, pubescent; leaf blade elliptic-ovate to ovate, 5–9 × 3–4(–5) cm, papery to subleathery, shiny, glabrous or abaxially puberulent, base cuneate to rounded and usually oblique, margin entire or obscurely serrulate near base, apex acuminate to caudate; veins 4 or 5 pairs, elevated on both surfaces. Inflorescences lax panicles, 25 × 10 cm, puberulent. Calyx ca. 1 mm, slightly 2-lipped, glandular; teeth 5, minute, nearly triangular. Corolla ca. 5 mm, outside puberulent and glandular, villous in throat, slightly 2-lipped; lower lip 3-lobed, lobes subrounded; upper lip subrounded, entire, Stamens nearly as long as corolla; anthers subglobose. Ovary glabrous, glandular. Style ca. 5 mm, sparsely glandular. Fruit black, (4.5–)5 mm in diam.

Mixed forests on mountain slopes; 800–1100 m. Hainan, SE Yunnan [Laos, Vietnam].

8. *Premna confinis* P'ei & S. L. Chen ex C. Y. Wu, Fl. Yun-nan. 1: 437. 1977.

滇桂豆腐柴 dian gui dou fu chai

Shrubs or small trees, 1.5–6 m tall, evergreen. Branchlets brown, terete, with dotted or linear lenticels, glabrous, densely scurfy glandular. Petiole 2–4 cm, densely glandular; leaf blade oblong, lanceolate, or rarely elliptic, 9–16 × 3.5–8 cm, leathery, adaxially glabrous and dark brown when dry, both surfaces dark yellow glandular, base cuneate to decurrent, margin entire or repand, apex acute to acuminate; veins 6 or 7 pairs, abaxially elevated. Panicles large and lax, ca. 20 cm, branches trichotomous; peduncle 1–3.5 cm; bracts 3–6(–12) mm. Calyx 4–5 mm, papery, nearly 2-lipped, lower lip 3-dentate, upper lip 2-dentate, both surfaces glabrous and glandular. Corolla yellow or white, ca. 8 mm, outside glabrous and densely glandular, densely villous in throat, 2-lipped; lower lip 3-lobed, ciliate; upper lip entire or emarginate. Filaments glabrous, slightly exerted; anthers dark brown. Ovary obovate, glabrous, apically glandular. Fruit purple-red, ca. 3 mm in diam., slightly tubercular, glandular.

• Mixed forests; 600 m. W Guangxi, SE Yunnan.

9. *Premna fordii* Dunn, Bull. Misc. Inform. Kew, Add. Ser. 10: 203. 1912.

长序臭黄荆 chang xu xiu huang jing

Shrubs, erect to climbing. Petiole 0.5–2 mm; leaf blade ovate-oblong to ovate, 4–11 × 3–4.5 cm, papery, abaxially dark yellow glandular, base truncate to subcordate, margin entire or sparsely serrate above middle, apex long acuminate. Panicles 2.5–17 × 2–5 cm. Calyx cup-shaped, 1–2 mm, slightly 2-lipped, 5-dentate, upper teeth obtuse, outside pubescent or glabrous and small yellow glandular. Corolla yellow or white, (3–)8 mm, tube slender, outside minutely tomentose or glabrous and glandular, inside glabrous except white villous at throat. Filaments glabrous. Ovary glabrous, apically yellow glandular. Style ca. 5.5 mm. Fruit subglobose, ca. 4 mm in diam. Fl. and fr. May-Jul.

• 1000–1200 m. Guangdong, Guangxi, Hainan.

1a. Calyx pubescent; corolla minutely tomentose

..... 9a. var. *fordii*

1b. Calyx and corolla glabrous 9b. var. *glabra*

9a. *Premna fordii* var. *fordii*

长序臭黄荆 chang xu xiu huang jing

Premna stenantha Merrill.

Leaf blade 4–8.5 cm. Panicles 2.5–10 cm. Calyx outside pubescent. Corolla outside minutely tomentose.

• Forests or along streams; 1000–1200 m. Guangdong, Guangxi, Hainan.

9b. *Premna fordii* var. *glabra* S. L. Chen, Fl. Reipubl. Pop-ularis Sin. 65(1): 211. 1982.

无毛臭黄荆 wu mao xiu huang jing

Leaf blade to 11 cm. Panicles to 17 cm. Calyx and corolla outside glabrous.

• Dense forests; 1000–1200 m. Guangxi (Dongxing Xian).

10. *Premna subscandens* Merrill, Philipp. J. Sci. 1 (Suppl.): 230. 1906.

攀援臭黄荆 pan yuan xiu huang jing

Shrubs, climbing, 3–5 m tall; petioles and inflorescences sparsely yellow-brown pubescent when young, becoming gray and glabrous. Branchlets grayish green. Petiole 1–4 cm; leaf blade dark brown when dry, elliptic to broadly ovate, 6–13.4 × 4–7 cm, papery, subglabrous to pilose on veins, base broadly truncate-rounded to subcordate, margin entire or irregularly serrulate, apex acuminate to acute; veins 3–6 pairs, ± 3-veined near base. Inflorescences 2–6 × 5–8 cm, branches dichotomous or trichotomous; bracts awl-shaped, 3–6 mm, both surfaces pubescent. Calyx campanulate, 2–3 mm, slightly 2-lipped, 5-dentate, outside pubescent. Corolla white, ca. 4 mm, slightly 2-lipped, 4-lobed, outside densely pubescent especially apically, villous in throat with hairs usually slightly exerted, lower lip 3-lobed, upper lip entire or emarginate. Stamens exerted. Ovary glabrous, glandular. Fruit globose, ca. 4 mm in diam. Fl. and fr. Apr-Jul.

Mountain slopes; 400–800 m. Hainan [Philippines].

11. *Premna puerensis* Y. Y. Qian, Guihaia 11: 123. 1991.

普洱豆腐柴 pu er dou fu chai

Shrubs, climbing, ca. 2 m tall; petioles and inflorescences pubescent when young, glabrescent. Branchlets subterete, grooved. Petiole 0.8–2 cm; leaf blade oblong, ovate, or rarely obovate, 3–8 × 2–4 cm, papery, abaxially dark green but becoming brownish when dry, adaxially dark green and glabrescent but pubescent along midvein, base broadly cuneate to rounded, margin entire or irregularly serrate, apex acuminate to acute, veins 4–6 pairs. Inflorescences corymbose cymes, 2–4 × 3–4 cm, dichotomous or trichotomous; bracts lanceolate, 5–6 mm, both surfaces pubescent. Calyx campanulate, 1.5–2 mm, slightly 2-lipped; lobes 5, pubescent. Corolla greenish, 3.8–4 mm, slightly 2-lipped; lower lip 3-lobed, middle lobe longest; upper lip emarginate. Stamens inserted at corolla throat; filaments basally villous. Style slightly longer than stamens. Fl. Jun.

- Thickets on mountain slopes; 1400 m. Yunnan (Puer Xian).

Allied to *Premna subscandens* and *P. puberula* but differs from the former in having leaf blades oblong, ovate, or rarely obovate and bracts lanceolate, and from the latter in having corymbose cymes, calyces campanulate, and calyx lobes obtuse.

12. *Premna maclurei* Merrill, Lingnan Sci. J. 6: 330. 1928.

弯毛臭黄荆 wan mao xiu huang jing

Shrubs, erect to climbing. Branchlets yellow-brown, with small lenticels, densely yellow-brown pilose when young, becoming brown and subglabrous. Petiole 1–1.5 cm, densely yellow-brown pilose; leaf blade oblong, elliptic, or obovate-oblong, 6–15 × 3–7 cm, leathery, rust colored, pubescent only along veins or abaxially densely pubescent, base rounded, margin entire, apex acuminate; veins 5–7 pairs, curve apically along margins and anastomose, reticulate veins elevated on both surfaces. Inflorescences 4–7 × 5–8 cm, densely yellow-brown pilose; branches 4 or 5 pairs; bracts awl-shaped, 2–3 mm. Calyx cup-shaped, ca. 2 mm, slightly 2-lipped, 5-dentate, pubescent. Corolla purplish in bud, becoming greenish white to greenish, ca. 4 mm, slightly 2-lipped, 4-lobed; outside pubescent, white villous in throat; lower lip 3-lobed, lobes oblong, subequal; upper lip subrounded. Stamens exerted. Ovary pubescent, apically yellowish glandular. Style ca. 6 mm. Fruit red, globose, 4–7 × 4–5 mm. Fl. and fr. Mar-Jun.

- Mixed forests on mountain slopes; 400–900 m. Hainan.

Allied to *Premna subscandens* but differs in having yellow-brown branches with distinctly yellowish rust colored lenticels, leaf blades usually oblong with both surfaces rust colored pubescent, and ovaries sparsely tomentose.

13. *Premna octonervia* Merrill & Metcalf, J. Arnold Arbor. 20: 354. 1939.

八脉臭黄荆 ba mai xiu huang jing

Shrubs or trees, erect; bark gray. Branchlets terete, with small rounded to elliptic lenticels, sparsely puberulent when young, glabrescent. Petiole 1–2.5 cm; leaf blade black and shiny when dry, ovate-oblong to ovate, 8–12 × 4–6 cm, papery, subglabrous to pubescent along veins, base broadly cuneate to subrounded, margin entire, apex acuminate to acute; veins 4 or 5 pairs, curve apically along margins and anastomose. Inflorescences 3–7 × 5–13 cm, sparsely puberulent; branches 3–5 pairs; bracts linear, ca. 6 mm. Calyx cup-shaped, ca. 1.5 mm, slightly 2-lipped, 5-dentate, pubescent and subglandular

when young, glabrescent. Corolla ca. 4 mm, slightly 2-lipped, 4-lobed; lower lip 3-lobed, lobes subequal or middle lobe slightly longer; upper lip entire or emarginate, outside subglabrous, long villous in throat with hairs usually exerted. Ovary glabrous, without glands. Style longer than stamens. Fruit obovate to globose, 3–5 × 3–4 mm, tuberculate. Fl. and fr. Aug-Nov.

- Mixed forests on mountain slopes or in open places; 200–800 m. Hainan.

14. *Premna latifolia* Roxburgh, Fl. Ind. ed. 1832, 3: 76. 1832.

大叶豆腐柴 da ye dou fu chai

Shrubs or small trees. Branchlets dark brown, striate, pubescent when young, subglabrescent. Petiole 1–2 cm, yellow pilose; leaf blade ovate-oblong, ovate, subrounded, or cordate, 5–20 × 4–10 cm, papery, abaxially densely yellow pilose, base cuneate, rounded, or cordate, apex acuminate to obtuse; veins 5–8 pairs, reticulate veins obscure. Inflorescences 3–6 × 4–8 cm, densely pubescent; bracts linear, 1–3 mm, deciduous. Calyx ca. 2 mm, slightly 2-lipped, 5-dentate, outside minutely hirsute, inside glabrous. Corolla dusty yellow, slightly 2-lipped, 5-lobed, outside puberulent, villous in throat. Stamens equal or longer than style, exerted; anthers black. Fruit black, tuberculate, glabrous. Fl. late spring to summer.

500–800 m. S Yunnan [Cambodia, India, Indonesia, Laos, Myanmar, Philippines, Vietnam].

- 1a. Leaf blade base rounded to cordate ... 14a. var. *latifolia*
- 1b. Leaf blade base cuneate 14b. var. *cuneata*

14a. *Premna latifolia* var. *latifolia*

大叶豆腐柴 da ye dou fu chai

Leaf blade 5–14 × 4–10 cm, base rounded to cordate, adaxially brown-black when dry.

Mixed evergreen forests; 600–700 m. S Yunnan [India, Indonesia, Laos, Myanmar, Philippines].

Timber.

14b. *Premna latifolia* var. *cuneata* C. B. Clarke in J. D. Hooker, Fl. Brit. Ind. 4: 578. 1885.

楔叶豆腐柴 xie ye dou fu chai

Premna latifolia var. *viburnoides* (Wallich ex Schauer) C. B. Clarke; *P. viburnoides* Wallich ex Schauer.

Leaf blade 13–20 × 10 cm, base cuneate, adaxially blue-black when dry.

Near farm houses; 500–800 m. S Yunnan [Cambodia, India, Indonesia, Myanmar, Philippines, Vietnam].

15. *Premna flavescens* Buchanan–Hamilton ex C. B. Clarke in J. D. Hooker, Fl. Brit. Ind. 4: 578. 1885.

淡黄豆腐柴 dan huang dou fu chai

Shrubs. Branchlets with white linear lenticels, pilose when young. Petiole 2–3 cm; leaf blade ovate-lanceolate to ovate, ca. 15 × 6.5 cm, papery, abaxially pilose, adaxially minutely hirsute, base obtuse to subcordate, apex acuminate to acute. Inflorescences 6–17 cm across, usually rust colored pilose; bracts linear, ca. 6 mm. Calyx ca. 2.5 mm, 5-dentate, pilose. Corolla greenish white, 4–5 mm, 4-lobed, both surfaces puberulent, densely villous in throat. Stamens and style

exserted. Fruit black when dry, 3–5 mm in diam. Fl. and fr. summer.

Open forests on mountain slopes in calcareous soil; 100–1300 m. S Guangdong, W Guangxi, S Yunnan [India, Indonesia, Malaysia, Vietnam].

16. *Premna fulva* Craib, Bull. Misc. Inform. Kew 1911: 442. 1911.

黄毛豆腐柴 huang mao dou fu chai

Premna fortunati Dop; *P. longipila* P'ei.

Shrubs or trees, sometimes climbing. Branchlets yellow villous when young, subglabrescent. Petiole 1.5–5.5 cm; leaf blade ovate-lanceolate, elliptic, oblong-ovate, ovate, or subrounded, 4–15 × 3–10 cm, papery, abaxially densely tomentose, adaxially yellow villous especially on veins, base cuneate and oblique, subrounded, or subcordate, margin entire, repand, or serrate, apex acuminate, acute, or rarely subrounded to emarginate; veins 5–7 pairs, abaxially elevated. Inflorescences 2.5–6(–10) × 4–9(–17) cm; branches 5 or 6 pairs, spreading; bracts linear to rarely linear-lanceolate, densely pubescent. Calyx 2–2.5 mm, slightly 2-lipped, 5-dentate, outside pubescent. Corolla greenish white, 4–5 mm, tube ca. 2 mm, slightly 2-lipped, lower lip 3-lobed, upper lip rounded to emarginate, throat pilose, outside puberulent to subglabrous. Stamens as long as style; anthers brown. Ovary apically sparsely pubescent. Fruit black, ovate to globose, 3–5(–6) mm in diam., tuberculate.

Mixed evergreen forests; 500–1200 m. SW Guangxi, S Guizhou, S Yunnan [Laos, Thailand, Vietnam].

Allied to *Premna crassa* and *P. flavescens* but differs in having young branchlets, petioles, and leaves yellow villous with long usually spreading hairs.

17. *Premna straminicaulis* C. Y. Wu, Fl. Yunnan. 1: 426. 1977.

草黄枝豆腐柴 cao huang zhi dou fu chai

Shrubs ca. 2 m tall. Branchlets shiny, striate, pilose and glandular when young, glabrescent. Petiole 3–6 cm, glabrous; leaf blade green, broadly elliptic to ovate, 6–12 × 6–8 cm, membranous, adaxially glabrous or puberulent only along veins, white glandular, base rounded and slightly oblique, margin serrate, apex acuminate to rarely caudate; veins 5 or 6 pairs, abaxially elevated. Inflorescences 2.5–3 × 3–3.5 cm, sparsely pubescent, densely white glandular; peduncle 1–1.5 cm; bracts linear, ca. 2 mm. Calyx 5-dentate, densely white glandular, sparsely puberulent to subglabrous. Corolla greenish white, outside pubescent, inside glabrous except for a ring of hairs at throat; lobes 4, rounded. Anthers purple-brown, subrounded. Fruit oblong, glabrous. Fl. May.

• Moist places; 1000 m. Yunnan (Ruili Xian).

18. *Premna tapintzeana* Dop, Bull. Soc. Bot. France 70: 836. 1923.

大坪子豆腐柴 da ping zi dou fu chai

Shrubs 1–4 m tall. Branches spreading, shiny, yellow-brown, puberulent when young, glabrescent. Petiole 1–5 cm; leaf blade ovate, subrounded, or cordate, 7–15 × 4–10 cm, papery, base rounded to cordate, margin subentire to slightly dentate to subentire, apex acuminate to obtuse; veins 6 or 7 pairs, abaxially elevated, 3-veined near base. Inflorescences 3–4(–7) × 6–8 cm, puberulent; bracts

lanceolate, ca. 3 mm. Calyx ca. 3 mm, puberulent; teeth 5, obtuse. Corolla greenish white, villous in throat. Stamens not exserted. Ovary flattened globose, glabrous. Style shorter than corolla. Fruit dark purple to black, obovate, tuberculate.

• Mixed forests; 1700–2400 m. NW Yunnan.

Allied to *Premna crassa* but differs in having calyces equally 5-dentate and corolla tubes slender and shorter than calyx.

19. *Premna crassa* Handel-Mazzetti, Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 58: 230. 1921.

石山豆腐柴 shi shan dou fu chai

Shrubs 1–5 m tall, nearly climbing. Branches brown; branchlets with small yellow lenticels. Leaves unequal in pairs, easily deciduous; petiole robust, 0.5–6 cm; leaf blade elliptic to ovate, (3–)5–11 × (2–)4–8 cm, papery, abaxially tomentose, adaxially pubescent, base rounded to subcordate and oblique, margin entire or dentate below middle, apex acuminate to obtuse; veins (4 or) 5–7 pairs, abaxially elevated, 3-veined near base. Inflorescences 1.5–5(–6) cm across; peduncle 0.5–1.8 cm; bracts linear-lanceolate, 4–8 mm. Calyx campanulate, 2–3 mm, slightly 2-lipped, 5-dentate, outside minutely hirsute and glandular. Corolla white or yellowish green, tube longer than calyx, slightly 2-lipped, lower lip deeply 3-lobed, upper lip slightly 2-lobed, villous in throat. Anthers brown. Ovary glabrous. Style as long as stamens. Fruiting calyx ca. 5 mm in diam. Fruit dark black when mature, obovate to globose, 2–4 mm in diam., tuberculate.

500–1800 m. W Guangxi, SW Guizhou, Yunnan [Vietnam].

1a. Corolla white 19a. var. *crassa*
1b. Corolla yellowish green 19b. var. *yui*

19a. *Premna crassa* var. *crassa*

石山豆腐柴 shi shan dou fu chai

Branchlets, leaves, and inflorescences yellow-brown pubescent, glabrescent. Corolla white. Fl. May, fr. Oct.

Mixed forests on mountain slopes in calcareous soil; 500–1600 m. W Guangxi, SW Guizhou, SE Yunnan [Vietnam].

Medicinal.

19b. *Premna crassa* var. *yui* Moldenke, Phytologia 18: 421. 1967.

凤庆豆腐柴 feng qing dou fu chai

Branchlets, leaves, and inflorescences subglabrous. Corolla yellowish green. Fl. Jun.

• Open forests; 1500–1800 m. Yunnan (Fengqing Xian and Longling Xian).

20. *Premna glandulosa* Handel-Mazzetti, Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 58: 232. 1921.

腺叶豆腐柴 xian ye dou fu chai

Shrubs 1–1.5 m tall; branchlets, petioles, and inflorescences densely circinate pubescent when young, glabrescent. Branches slender, erect to horizontal; branchlet brown with sparse small round lenticels. Leaves easily deciduous; petiole slender, 0.5–1.5 mm; leaf blade ovate, 2.5–4.5(–5) × 1.5–3(–4) cm, submembranous, minutely hirsute on veins and purple-red glandular, base broadly rounded to subcordate and usually oblique, margin serrulate, apex acuminate, obtuse, or emarginate; veins 3 or 4 pairs,

abaxially with densely pitted reticulate veins. Inflorescences 1.5–2.5 cm across; peduncle 0.6–1.7 cm; bracts linear to lanceolate, 4–5 mm. Calyx campanulate, 1.5–2 mm, scaly pubescent, glandular; teeth 5, narrowly triangular to ovate. Corolla violet to pinkish, 4.5–5 mm, 2-lipped, lower lip ca. 1/2 as long as upper lip, outside white puberulent, inside glabrous but white villous in throat. Stamens as long as style, shorter than corolla. Ovary globose, apically glandular. Fl. Jul.

• Roadsides; 1500–1900 m. Yunnan (Dayao Xian and Chuxiong Xian).

21. *Premna henryana* (Handel-Mazzetti) C. Y. Wu, Fl. Yunnan. 1: 433. 1977.

蒙自豆腐柴 meng zi dou fu chai

Premna steppicola Handel-Mazzetti var. *henryana* Handel-Mazzetti, Symb. Sin. 7: 902. 1936.

Shrubs. Branchlets dark brown, robust, short, striate, with white lenticels, dusty yellow puberulent when young, glabrescent. Petiole 1–1.5 cm, pilose; leaf blade ovate to broadly ovate, 4–7 × 2–4.5 cm, papery, abaxially gray puberulent and deep red glandular, adaxially puberulent and orange glandular, base rounded to subcordate, margin crenate to basally subentire, apex acute to acuminate; veins 3 or 4 pairs, adaxially slightly elevated. Inflorescences ca. 1.5 cm across, pilose. Calyx 5-dentate, teeth triangular-lanceolate, pilose, deep red glandular. Corolla ca. 6 mm, 2-lipped, outside puberulent, deep red glandular, white villous in throat. Ovary basally pilose, glandular.

• Mixed forests; 1300–1500 m. SW Sichuan, NW Yunnan.
Medicinal.

22. *Premna punicea* C. Y. Wu, Fl. Yunnan. 1: 433. 1977.

玫红豆腐柴 mei hong dou fu chai

Shrubs; branchlets, petioles, and peduncles pilose when young, glabrescent. Branchlets dark gray, slender, short, with tuberculate lenticels. Petiole ca. 5 mm, circinate pilose; leaf blade oblong, 2–3.5 × 1–1.5 cm, papery, minutely hirsute and orange glandular, base rounded, margin subentire or only serrate at middle, apex slightly acuminate to acute or rarely obtuse to slightly emarginate; veins 2 or 3 pairs, abaxially slightly elevated. Inflorescences ca. 1 cm across; peduncle ca. 5 mm. Calyx campanulate, ca. 8 mm, deeply 5-dentate below middle, minutely hirsute and orange glandular; teeth linear-lanceolate, ca. 6 mm. Corolla pinkish, 6–8 mm, slightly 2-lipped; tube glabrous outside, white villous in throat, lobes 4, outside white pilose and orange glandular. Ovary obovate, pilose, apically white glandular. Style robust, ca. 4 mm, slightly puberulent. Fl. Jul–Aug.

• Mixed forests; 1600 m. Yunnan (Heqing Xian).

23. *Premna rubroglandulosa* C. Y. Wu, Fl. Yunnan. 1: 431. 1977.

红腺豆腐柴 hong xian dou fu chai

Shrubs ca. 1 m tall; branchlets, petioles, and peduncles yellowish brown glandular when young, glabrescent. Branchlets slender, with sparse gray elliptic lenticels. Petiole 1–1.5 cm; leaf blade ovate, 3–6.5 × 2–4 cm, papery, abaxially sparsely pubescent when young, densely orange glandular puberulent on veins, base rounded to subcordate, margin dentate, apex acuminate to acute, veins 3 or 4 pairs, 3-veined at

base. Inflorescences 1.5–2.5 cm; peduncle ca. 1 cm. Calyx 6–7 mm, outside densely puberulent, inside sparsely puberulent, both surfaces orange glandular; teeth 5, narrowly triangular, ca. 2 × as long as tube. Fruit black, obovate, ca. 4 × 3 mm, 4-veined when dry, glabrous, without glands.

• Mountain slopes along roadsides; 1100 m. SW Yunnan.

24. *Premna urticifolia* Rehder in Sargent, Pl. Wilson. 3: 458. 1917.

麻叶豆腐柴 ma ye dou fu chai

Shrubs 1–3 m tall. Branchlets with small elliptic and round lenticels, pilose when young, glabrescent. Petiole 1–4 cm, circinate pubescent; leaf blade ovate, 3–9 × 2–6 cm, submembranous, sparsely pubescent, glandular, usually pitted by deciduous glands, base rounded to cordate, apex acuminate. Inflorescences subglobose, 1.5–2.5 × 2–3.5 cm; peduncle 1–2.6 cm; bracts linear, ca. 6 mm, densely pubescent. Pedicel densely pilose, glandular. Calyx cup-shaped, ca. 2 mm, slightly 2-lipped, both surfaces pilose and glandular; teeth 5, obtusely triangular, 0.5–0.8 mm. Corolla pinkish, ca. 6 mm, slightly 2-lipped, 4-lobed, outside pilose and glandular, villous in throat; upper lip entire, covering other 3 lobes in bud. Ovary glabrous, apically yellow and purple-red glandular. Fruit black, ovate, 3–5 × 2–4 mm, longer than calyx. Fl. and fr. Jul–Sep.

• Mixed forests on mountain slopes; 1600 m. S Yunnan.

Medicinal.

Allied to *Premna glandulosa* and *P. rubroglandulosa* but differs in having yellow glandular leaf blades pitted by deciduous glands.

25. *Premna parvilimba* P'ei, Mem. Sci. Soc. China 1(3): 62. 1932.

小叶豆腐柴 xiao ye dou fu chai

Celastrus yunnanensis H. Léveillé (1916), not *P. yunnanensis* W. Smith (1916), not *P. yunnanensis* Dop (1923).

Shrubs. Branchlets and petioles densely pubescent. Branchlets slender. Petiole terete, 2–6 mm; leaf blade lanceolate to ovate-lanceolate, 0.5–3.8 × 0.3–1.1 cm, papery, sparsely pubescent, base rounded, margin apically sparsely serrate, apex obtuse; veins 3 or 4 pairs, abaxially elevated. Inflorescences to 2.5 cm across, few to 25-flowered, densely pubescent, glandular; peduncle ca. 5 mm; bracts lanceolate, ca. 4 mm. Pedicel ca. 2 mm. Calyx tube ca. 2 mm, teeth 5, pubescent and glandular but more densely so outside. Corolla pinkish, ca. 6 mm, villous in throat, 2-lipped, lower lip concave, outside pubescent and glandular. Stamens slightly exerted. Style glabrous. Ovary with few hairs, glandular.

• Valleys; 400 m. Yunnan (Jinsha Jiang valley).

Allied to *Premna steppicola* but differs in having leaf blades lanceolate to ovate-lanceolate, bracts lanceolate, and stamens exerted.

26. *Premna steppicola* Handel-Mazzetti, Symb. Sin. 7: 902. 1936.

草坡豆腐柴 cao po dou fu chai

Shrubs. Branchlets, petioles, and inflorescences densely puberulent when young, glabrescent. Branchlets slender. Petiole 4–5 mm; leaf blade broadly ovate, 1.5–3.5 × 1.2–2 cm, abaxially densely puberulent along veins, adaxially minutely hirsute, base subrounded, margin slightly dentate near base, apex acuminate, veins 3 or 4 pairs. Inflorescences ca. 1.5–2 cm across; bracts linear, densely white pilose. Calyx campanulate,

3–4 mm; teeth 5, lanceolate, ca. 2/3 calyx length, sparsely minutely hirsute, densely glandular. Corolla ca. 6 mm, sparsely minutely hirsute, densely glandular, villous in throat, slightly 2-lipped, lower lip 3-lobed, upper lip emarginate. Stamens nearly included. Ovary apically glandular. Fruit black, ca. 2.5 mm in diam. Fr. Oct.

• Valleys or waste places; 1400–1500 m. SW Sichuan, NW Yunnan.

Medicinal.

27. *Premna oligantha* C. Y. Wu, Fl. Yunnan. 1: 434. 1977.

少花豆腐柴 shao hua dou fu chai

Shrubs 30–100 cm tall, much branched. Branchlets grayish when young, becoming dark gray, dark striate. Petiole slender, 1–2 mm, puberulent; leaf blade ovate-lanceolate, ovate, or subrounded, (2.5–)5–6 × (0.3–)1–1.5 cm, abaxially puberulent on veins, adaxially dark green and minutely hirsute, yellow glandular, base cuneate to subrounded, margin entire or serrate, apex obtuse; veins 2 or 3 pairs, abaxially elevated. Inflorescences 2–4(–6)-flowered; peduncle 1–2 mm; bracts linear. Calyx ca. 5 mm, 5-dentate to middle, puberulent, glandular. Corolla purplish, ca. 6 mm, 2-lipped, tube outside glabrous and glandular; lower lip with 3 rounded lobes; upper lip rounded, lobes densely puberulent, glandular. Ovary black-brown, obovate, ca. 1.5 mm, glabrous, apically glandular. Style capillary, puberulent. Fruit black. Fl. and fr. Jun–Oct.

• Dry mountain slopes; 2100–3200 m. Sichuan, SE Xizang, NW Yunnan.

28. *Premna acutata* W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 119. 1916.

尖齿豆腐柴 jian chi dou fu chai

Shrubs 1–4 m tall. Branchlets sparsely lenticellate, dusty yellow tomentose when young, becoming yellow-brown and glabrous. Leaves pairs unequal; petiole 4–12 mm, pubescent, glandular; leaf blade ovate-lanceolate to ovate, 4–8 × 2–4 cm, glandular, abaxially yellow-green and subglabrous, adaxially dark green and minutely hirsute especially on veins, base cuneate to subrounded, margin deeply and sharply serrate, apex acuminate to caudate-acuminate; veins 3 or 4 pairs, 3-veined at base. Inflorescences subsessile, 1.5–2.5 cm across. Calyx 5–8 mm, tube ca. 1.5 mm, deeply 5-dentate, minutely hirsute and yellow glandular. Corolla rose red, slightly longer than calyx, 2-lipped, outside puberulent and glandular, inside villous. Stamens nearly as long as corolla. Ovary with a few hairs, glandular. Fruit black, ovate-globose, ca. 4 mm in diam. Fl. and fr. summer-autumn.

• Thicket edges; 2700–3000 m. SW Sichuan, NW Yunnan.

Species 28–33 in this account are very similar, and their status requires further investigation. Key characters such as flower color and corolla indumentum show more variation than has traditionally been accepted.

29. *Premna mekongensis* W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 120. 1916.

澜沧豆腐柴 lan cang dou fu chai

Shrubs ca. 1 m tall, erect. Branchlets yellow-brown, becoming dark brown, with striate lenticels, grayish circinate tomentellous when young. Petiole ca. 1 cm, grayish puberulent; leaf blade ovate-lanceolate to ovate, 0.8–5.5 ×

0.4–3 cm, papery, abaxially densely tomentellous, adaxially grayish puberulent, base rounded, margin subentire, repand, or serrulate, apex acuminate to obtuse. Inflorescences few to 12-flowered, 1–2.5 cm across; peduncle subsessile or very short, grayish pilose; bracts linear, densely pilose. Pedicel very short, grayish pilose. Calyx cup-shaped, 6–7 mm, 5-dentate basally to middle, densely grayish pilose, sparsely yellow glandular; teeth linear-lanceolate, subequal. Corolla yellow or white, ca. 8 mm, slightly longer than calyx, white villous in throat, 2-lipped, tube outside glabrous; lower lip 3-lobed; upper lip rounded, emarginate; lobes puberulent, sparsely glandular. Stamens included; filaments glabrous. Ovary ovate, glabrous. Fruiting calyx ca. 1 cm. Fruit black, globose, ca. 4 mm in diam., glabrous, apically glandular. Fl. and fr. Jun–Sep.

• 1800–2700 m. NW and W Yunnan.

The corolla exterior of the holotype of *Premna mekongensis* is distinctly hairy.

1a. Leaf blade 2.5–5.5 × 2–3 cm 29a. var. *mekongensis*
1b. Leaf blade 0.8–2 × 0.4–0.7 cm 29b. var. *meiophylla*

29a. *Premna mekongensis* var. *mekongensis*

澜沧豆腐柴 lan cang dou fu chai

Leaf blade 2.5–5.5 × 2–3 cm. Inflorescences 6–12-flowered; peduncle short.

• Mixed forests on mountain slopes; 1800–2700 m. NW and W Yunnan.

29b. *Premna mekongensis* var. *meiophylla* W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 120. 1916.

小叶澜沧豆腐柴 xiao ye lan cang dou fu chai

Branchlets more slender than in var. *mekongensis*. Leaf blade 0.8–2 × 0.4–0.7 cm. Inflorescences subsessile, few flowered.

• Grasslands; 2100–2400 m. Yunnan (Lijiang Xian).

30. *Premna yunnanensis* W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 120. 1916.

云南豆腐柴 yun nan dou fu chai

Shrubs 0.8–2 m tall. Branchlets grayish minutely tomentose when young, glabrescent. Petiole terete, 5–10 mm; leaf blade ovate-lanceolate to ovate, 2–6 × 1.5–3 cm, papery, golden glandular, abaxially densely gray circinate pilose, adaxially dark green and pilose, base subrounded and slightly oblique, margin subentire to serrate, apex acuminate to acute. Calyx ca. 4 mm, deeply 5-dentate below middle, teeth narrowly triangular, both surfaces pubescent and golden glandular. Corolla pinkish to purple, ca. 6 mm, tube subglabrous but densely villous in throat, 2-lipped; lower lip 3-lobed; upper lip ca. 4 mm, subrounded; lobes puberulent, outside glandular. Stamens slightly exerted; filaments glabrous but villous at base. Ovary obovate, glabrous, apically glandular. Fruit black, 3–5 × 2–3 mm. Fl. and fr. May–Sep.

• Grasslands; 1800–2200 m. SW Sichuan, W Yunnan.

Allied to *Premna mekongensis* but differs in corollas pinkish to purple, fruit as long as fruiting calyces, and calyx teeth narrowly triangular. Some of the *P. yunnanensis* paratype collections of G. Forrest are described as having yellowish flowers but are otherwise indistinguishable from the holotype.

31. *Premna velutina* C. Y. Wu, Fl. Yunnan. 1: 428. 1977.

黄绒豆腐柴 huang rong dou fu chai

Shrubs ca. 50 cm tall. Branches, petioles, and axis of inflorescences densely dusty villous. Branches terete, striate. Petiole robust, (1-)2-3 cm; leaf blade cordate, (2.5-)6-9 × (1-)3.5-6 cm, abaxially densely dusty tomentose and glandular, adaxially dark green, densely dusty yellow villous, orange glandular, margin serrate, apex acuminate to acute; veins 5 or 6 pairs, curve apically along margins and anastomose. Inflorescences capitate to nearly conical; peduncle ca. 5 mm; bracts linear lanceolate, densely pilose. Calyx ca. 4 mm, slightly 2-lipped, lower lip 2-dentate with lanceolate teeth, upper lip 3-dentate with triangular teeth, outside minutely hirsute and orange. Corolla yellow, ca. 5 mm; tube glabrous outside, dark villous in throat; lower lip 3-lobed; upper lip rounded, lobes outside glandular and puberulent. Ovary ca. 1 mm, obovate, glabrous, glandular. Style glabrous. Fruit brownish, oblong, 3-4 mm. Fl. and fr. Jun-Sep.

- Mixed forests; 1500 m. SW Yunnan.

32. *Premna tenii* P'ei, Mem. Sci. Soc. China 1(3): 66. 1932.

圆叶豆腐柴 yuan ye dou fu chai

Shrubs. Branches, branchlets, leaves, and inflorescences densely pubescent. Petiole ca. 3 mm, densely circinate pilose; leaf blade broadly ovate to subrounded, 2-8 × 0.9-5.7 cm, membranous, densely pubescent, sparsely glandular, base cuneate to rounded, margin subentire, undulate, or crenate, apex obtuse to rounded, veins 3-6 pairs. Inflorescences subsessile. Calyx deeply 5-dentate, teeth ca. 6 mm, both surfaces villous and sparsely glandular. Corolla ca. 7 mm, outside villous, throat villous and sparsely glandular. Stamens slightly exerted; filaments and style glabrous. Ovary with few hairs, glandular.

- Mixed forests; 1300-1600 m. Yunnan (Dayao Xian).

Allied to *Premna acutata* but differs in leaf blade shape and margins.

33. *Premna subcapitata* Rehder in Sargent, Pl. Wilson. 3: 458. 1917.

近头状豆腐柴 jin tou zhuang dou fu chai

Premna pilosa P'ei.

Shrubs 1-2 m tall. Branches brown to brownish, with elliptic to rounded yellowish lenticels, yellowish pilose when young, subglabrescent. Petiole 4-10 mm; leaf blade ovate-oblong to ovate, 2.5-8.5 × 1.5-4.8 cm, abaxially tomentose and glandular, adaxially dark yellow-green pilose and yellow glandular, base rounded to truncate, margin serrate except for apex and base, apex acuminate to acute. Inflorescences 0.6-2.5 × 1-3.5 cm; peduncle 0.5-2 cm; bracts linear to sub-lanceolate, 5-10 mm. Calyx cup-shaped, ca. 4 mm, deeply 5-dentate, both surfaces pubescent and yellowish glandular; teeth lanceolate to narrowly triangular, ca. 2 × 1 mm. Corolla yellow-green to greenish, ca. 6 mm, outside puberulent and glandular, throat villous, 2-lipped, tube ca. 3 mm, lower lip 3-lobed with lobes rounded, upper lip entire. Stamens slightly exerted. Ovary sparsely puberulent, densely glandular. Style ca. 6 mm. Fruit dark black, ovate, 3-4 × 2-3 mm, sparsely pubescent, yellowish glandular. Fl. and fr. May-Aug.

- Mixed forests on mountain slopes; 2600 m. SW Sichuan, NE Yunnan.

34. *Premna fohaiensis* P'ei & S. L. Chen ex C. Y. Wu, Fl. Yunnan. 1: 436. 1977.

勐海豆腐柴 meng hai dou fu chai

Shrubs or trees. Branchlets, petioles, and inflorescences yellow-brown circinate tomentose. Branchlets with small lenticels, becoming grayish yellow and glabrous. Petiole 3-4.5 cm; leaf blade elliptic-lanceolate, elliptic, or broadly ovate, 14-18 × 7-9.5 cm, papery, abaxially tea brown when dry and tomentose when young, adaxially dark brown when dry and densely minutely hirsute, base rounded to truncate, margin entire, apex acuminate; veins 7-9 pairs, curve apically along margins and slightly anastomose. Inflorescences 5-8 × 8-13 cm. Calyx cup-shaped, ca. 1 cm, slightly 2-lipped, pilose, 4-toothed; teeth ovate, with small yellow glands. Corolla yellow-green, ca. 2 mm; tube ca. 1.5 mm, glabrous except for a ring of hairs inside above throat; lobes 4, oblong, spreading. Stamens and style exerted. Ovary glabrous, apically glandular. Fruit black, ovate, sparsely yellowish glandular. Fl. and fr. May-Jul.

- Forests; 1500-1800 m. S Yunnan.

35. *Premna szemaensis* P'ei, Mem. Sci. Soc. China 1(3): 76. 1932.

思茅豆腐柴 si mao dou fu chai

Trees (4-)7-12 m tall. Branchlets, petioles, and inflorescences brown tomentose. Branchlets lenticellate, nodes usually with a rounded or half rounded leaf scar, with gland-tipped hairs when young, glabrescent. Petiole terete, 0.5-6 cm; leaf blade broadly ovate to ovate-lanceolate, 8-18 × 6-14 cm, papery, abaxially densely brown tomentose, adaxially sparsely pubescent, base broadly cuneate to subrounded, margin entire or irregularly serrate, apex acuminate to acute; veins 6-8 pairs, abaxially elevated. Inflorescences 5-12 × 7-23 cm; peduncle 1.5-3 cm; bracts linear, 4-15 mm. Calyx campanulate, ca. 1.5 mm, subtruncate to slightly 2-lipped; lips usually slightly 2-dentate, pubescent, yellow glandular. Corolla greenish to yellowish, 3.5-4 mm, outside puberulent, inside glabrous except villous at throat. Stamens and style exerted; filaments puberulent at base. Ovary glabrous, apically yellow glandular. Fruit black, obovate to rounded, 5-7 × 4-5 mm. Fl. and fr. Jun-Sep.

- Open forests; 500-1500 m. S Yunnan.

Medicinal.

Allied to *Premna fohainensis* but differs in having subtruncate to slightly 2-lipped calyces, lips usually slightly 2-dentate, and branchlet nodes with a rounded or half rounded leaf scar.

36. *Premna paisehensis* P'ei & S. L. Chen in S. L. Chen, Fl. Reipubl. Popularis Sin. 65(1): 211. 1982.

百色豆腐柴 bai se dou fu chai

Trees ca. 13 m tall; bark gray. Branchlets green pubescent when young, becoming brown, glabrous, and striate. Leaf blade narrowly elliptic to elliptic, 9-15 × 3-6.5 cm, sub-membranous, abaxially yellowish green, adaxially minutely hispid, densely brown tomentose, and yellowish glandular, base obtuse to broadly cuneate, margin entire or slightly irregularly undulate, apex acute to subacuminate; veins

5 or 6 pairs, abaxially elevated. Inflorescences lax, spreading, dichotomous, 12–15 × 10–20 cm; peduncle 4–6 cm, densely yellow-brown pubescent; bracts linear, 2–9 mm. Fruiting calyx subtruncate, outside sparsely pubescent and glandular. Fruit purple, globose to ovate, 5–6 × 4–5 mm, pubescent, glandular. Fr. Jul-Aug.

- Mixed forests on mountain slopes; 1000 m. Guangxi (Bose Xian).

Allied to *Premna szemaensis* but differs in having narrower submembranous leaf blades.

37. *Premna scoriarum* W. Smith, Notes Roy. Bot. Gard. Edinburgh 12: 219. 1920.

腾冲豆腐柴 teng chong dou fu chai

Trees 20 m tall. Branchlets black when young, becoming gray-brown, terete, with sparse linear lenticels. Petiole 1.5–3.5 cm; leaf blade narrowly elliptic, ovate-lanceolate, or ovate, 10–15(–21) × 5–9(–10) cm, thickly papery, both surfaces glabrous and with elevated veins, abaxially green, adaxially shiny and dark green but black when dry, veins 6 or 7 pairs. Inflorescences lax corymbs, 8–10 × 14 cm, 3–5 × dichotomously branched; peduncle ca. 3 cm, sparsely puberulent; bracts linear-lanceolate, ca. 5 mm, sparsely puberulent. Calyx campanulate, ca. 1 mm, 4-dentate to middle, outside puberulent; teeth oblong, subequal, apex obtuse. Fruit dark green, oblong-obovate, 2.5–3(–4) mm.

Dense forests; 1300–1700 m. W Yunnan [Myanmar].

38. *Premna scandens* Roxburgh, Fl. Ind. ed. 1832, 3: 82. 1832.

藤豆腐柴 teng dou fu chai

Plants climbing. Branchlets and inflorescences sparsely puberulent when young, glabrescent. Branchlets terete, brown, lenticellate. Petiole black, 1–3.5 cm, glabrous; leaf blade lanceolate, elliptic, ovate, or rarely obovate, 10–16 × (4–)5–8 cm, abaxially brown when dry, midvein elevated, reticulate veins slightly evident, adaxially black and shiny, base rounded to cordate and oblique, apex abruptly acuminate to acute. Inflorescences spreading, 7–10 × (9–)20–30 cm; branches 5 or 6 pairs, puberulent; bracts lanceolate, 3–6 mm. Flowers subsessile, 4–5 mm. Calyx cup-shaped, ca. 1.5 mm, truncate to slightly 2-lipped; lips slightly 2-dentate, puberulent. Corolla grayish yellow, ca. 3 mm; tube ca. 2 mm, villous in throat, outside glabrous; lobes 4, subequal, apex obtuse to rounded. Stamens as long as style, slightly exerted. Ovary glabrous. Fruit blue-black, obovate, 7–8 × 4–6 mm, tuberculate. Fl. and fr. May-Jul.

Mixed forests; 500 m. Yunnan (Mengla Xian) [Bangladesh, Bhutan, India, Myanmar, Vietnam].

39. *Premna odorata* Blanco, Fl. Filip. 488. 1837.

毛鱼臭目 mao yu xiu mu

Premna vestita Schauer.

Trees, small. Branchlets pubescent. Petioles 3–7 cm; leaf blade oblong to ovate, 10–12(–20) × 6–7 cm, base rounded to somewhat cordate, abaxially uniformly densely softly pubescent, margin entire or crenulate, apex acute, veins 6 pairs. Inflorescences 8–20 cm wide. Calyx 2-lipped, 5-lobed. Corolla greenish white to nearly white, 4–5 mm. Fruit dark purple, globose, ca. 4 mm in diam.

Thickets and forests near seashore. N and S Taiwan [Philippines].

Specimens of this species have not been seen by the authors. Typical material from Philippines reportedly has leaf blades ovate to broadly ovate and to 20 cm long.

40. *Premna serratifolia* Linnaeus, Mant. Pl. 253. 1771.

伞序臭黄荆 san xu xiu huang jing

Cornutia corymbosa N. L. Burman; *Premna corymbosa* Rottler & Willdenow; *P. corymbosa* (N. L. Burman) Merrill (1917), not Rottler & Willdenow (1803); *P. integrifolia* Linnaeus; *P. integrifolia* var. *obtusifolia* (R. Brown) Pei; *P. obtusifolia* R. Brown.

Shrubs or trees, 1–8 m tall, erect or rarely climbing. Branchlets with elliptic yellowish lenticels, densely pubescent when young, subglabrescent. Petiole 0.3–5 cm, puberulent; leaf blade oblong to broadly ovate, 3–15 × 2.5–9.5 cm, papery, subglabrous or pubescent only along veins, base broadly cuneate, rounded, or truncate, margin entire, slightly undulate, or crenate, apex acute to rarely acuminate or obtuse. Inflorescences 1.5–15 × 2.5–24 cm; peduncle 0.8–3 cm; bracts linear to lanceolate, to 6 mm, puberulent. Calyx cup-shaped, 1.5–3 mm, 2-lipped, lower lip subentire to shortly 3-dentate, upper lip longer than lower lip and 2-dentate, outside puberulent and yellow glandular. Corolla yellowish green, outside glandular, villous in throat, slightly 2-lipped; lower lip 3-lobed, lobes subequal or middle lobe slightly longer and broader; upper lip entire or emarginate. Ovary glabrous, apically glandular. Style 3.5–4 mm. Fruit globose, 2–4 mm in diam. Fl. and fr. Apr-Oct.

Mixed and open forests on mountain slopes and along streams; 100–300 m. Guangdong, Guangxi, Taiwan [S and SE Asia, Australia, Pacific Islands].

41. *Premna hainanensis* Chun & How, Acta Phytotax. Sin. 7: 77. 1958.

海南臭黄荆 hai nan xiu huang jing

Shrubs 1–3 m tall, erect to climbing. Branchlets and inflorescences mealy when young, subglabrescent. Branchlets brown striate, conspicuously lenticellate. Petiole 0.8–1.2 cm; leaf blade dark green when dry, elliptic to ovate-elliptic, 4–9 × 2–4.5 cm, papery to subleathery, shiny, glabrous or pubescent along veins, midvein abaxially raised and adaxially impressed, base broadly cuneate to subrounded, margin entire, apex acuminate to obtuse; veins 5 or 6 pairs, curve apically along margins and anastomose. Inflorescences 2–5 cm across; peduncle 0.5–1.5 mm; bracts awl-shaped, ca. 1.5 mm. Calyx 1.8–2 mm, puberulent to subglabrous. Corolla yellow or white, outside puberulent, white villous in throat, slightly 2-lipped, tube 3–4 mm, lower lip 3-lobed with middle lobe longer than laterals, upper lip emarginate. Stamens exerted. Ovary subrounded, glabrous. Style ca. 3 mm. Fruiting calyx 2-lipped to subtruncate, lower lip subentire to slightly 2-dentate, upper lip 2-dentate. Fruit green when young, becoming brown, obovate, 2–3 mm in diam. Fl. and fr. Sep-Nov.

- Thickets on mountain slopes; 200–400 m. Hainan.

Allied to *Premna serratifolia* but differs in having papery to subleathery leaf blades, lateral veins adaxially obscure, and calyxes with lower lip subentire to slightly 2-dentate.

42. *Premna laevigata* C. Y. Wu, Fl. Yunnan. 1: 440. 1977.

平滑豆腐柴 ping hua dou fu chai

Shrubs 2–3 m tall. Branchlets purple-brown when young but becoming brown, terete, striate, glabrous, with sparse small yellow lenticels, mealy. Petiole 2.7–3 cm, glabrous; leaf blade ovate-oblong to elliptic, 7–14 × 3–7 cm, leathery, glabrous, abaxially yellow-green, adaxially brownish green to tea green, base cordate to subrounded, margin serrate above middle, apex acuminate to caudate-acuminate; veins 6 or 7 pairs, midvein abaxially raised and adaxially slightly compressed, reticulate veins obscure. Inflorescences 3–8 × 2–3.5 cm; peduncle 1–1.5 cm; bracts linear-lanceolate, ca. 3 mm, easily deciduous. Calyx 3–3.5 mm, 2-lipped, lips entire or lower lip emarginate and upper lip with 3 minute emergences. Corolla 3–6 mm, 2-lipped, lower lip 3-lobed, upper lip entire and larger than lower lip, villous in throat. Stamens shorter than corolla; filaments glabrous. Ovary globose, glabrous. Style ca. 4 mm, glabrous. Fruiting calyx tuberculate. Fruit dark brown, 6 × 4–4.5 mm. Fr. Sep-Nov.

- Mixed forests; 500–600 m. Yunnan (Mengla).

43. *Premna racemosa* Wallich ex Schauer in A. de Candolle, Prodr. 11: 633. 1847.

总序豆腐柴 zong xu dou fu chai

Shrubs (3–)5–6 m tall, erect to climbing. Branchlets, petioles, inflorescence rachises, and leaf veins rust colored hirsute. Branchlets terete, becoming yellowish brown to red-brown and subglabrous, nodes with an elevated leaf scar. Petiole 8–10 mm; leaf blade rhomboid-elliptic to ovate, 6–10 × 3.7–6 cm, subleathery, minutely hirsute especially on veins, base broadly cuneate to subrounded, margin entire or rarely obscurely serrulate, apex acuminate, acute, or rarely obtuse; veins 6 or 7 pairs, slightly elevated on both surfaces. Inflorescences racemelike thyrses; bracts lanceolate to ovate, sparsely minutely hispid. Calyx with a tube ca. 2 mm, 2-lipped; lips entire, sparsely minutely hirsute, glandular. Corolla white, 4-lobed, exerted from calyx, tube ca. 4 mm, outside sparsely glandular, inside puberulent, yellowish villous in throat. Stamens conspicuously exerted. Ovary glabrous. Styles shorter than stamens; stigmas 2. Fruit narrowly obovate, ca. 4 mm, apically glabrous. Fl. and fr. May-Jul.

Mixed forests; 1400–2900 m. Xizang, SE Yunnan [Bangladesh, India, Myanmar, Nepal].

44. *Premna interrupta* Wallich ex Schauer in A. de Candolle, Prodr. 11: 633. 1847.

间序豆腐柴 jian xu dou fu chai

Shrubs, erect to slightly climbing. Branchlets brownish, pubescent when young, glabrescent. Petiole 3–4 mm or leaves subsessile; leaf blade ovate-oblong to obovate, 8.5–13 × 4–8 cm, papery, pubescent especially on veins or abaxially subglabrous and yellow glandular, base acuminate to rarely cuneate or rounded, margin entire or obscurely serrulate above middle, apex acuminate. Inflorescences spikelike thyrses, ca. 7 × 1.5 cm; peduncle ca. 1.8 cm, densely velvety; bracts lanceolate, ca. 1 cm, pilose. Calyx campanulate, ca. 2 mm, 2-lipped; lips entire or upper lip emarginate and ciliate, subglabrous to sparsely puberulent, yellow glandular. Corolla white or yellowish green, 4-lobed, subglabrous, outside glandular, villous in throat. Stamens exerted. Ovary glabrous or sparsely pubescent, glandular. Fruit black, obovate, apically yellow glandular. Fl. and fr. May-Aug.

Mixed forests; 1500–2600 m. Guangxi, Sichuan, SE Xizang, Yunnan [Bhutan, India, Myanmar, Nepal].

45. *Premna bracteata* Wallich ex C. B. Clarke in J. D. Hooker, Fl. Brit. Ind. 4: 572. 1885.

苞序豆腐柴 bao xu dou fu chai

Trees ca. 13 m tall. Branchlets and inflorescences densely dusty yellow to gray velvety. Branchlets purple-brown, with sparse oblong to linear lenticels, subglabrescent, nodes with a prominent leaf scar. Petiole 1.5–2 cm; leaf blade elliptic to broadly ovate, 6.5–17 × 5.5–10 cm, subleathery, abaxially pubescent, adaxially shiny, base subrounded, apex abruptly acuminate; veins 6–8 pairs, midvein abaxially very prominent. Inflorescences spikelike thyrses with sessile cymes laxly arranged on axis; bracts ovate, ca. 5 × 2 mm, minutely tomentose. Calyx ca. 2 mm, 2-lipped; lips entire, yellowish velvety. Corolla exerted from calyx, 4-lobed, tube ca. 2 mm, pilose in throat. Stamens and style exerted; filaments glabrous. Ovary apically pubescent. Fruit globose, 1.5–2 mm in diam. Fl. May.

Mixed forests; 600–1300 m. SE Xizang, S Yunnan [Bangladesh, Bhutan, India].

46. *Premna herbacea* Roxburgh, Fl. Ind. ed. 1832, 3: 80. 1832.

千解草 qian jie cao

Premna humilis Merrill; *P. nana* Collett & Hemsley; *P. obovata* Merrill; *Pygmaopremna herbacea* (Roxburgh) Moldenke.

Subshrubs ca. 9 cm tall. Rhizomes woody. Branches sparsely yellow-brown pilose or glabrous. Leaves rosulate; leaf blade obovate-oblong to spatulate, 3–14 × 2–6(–9) cm, sparsely pubescent and yellow glandular, base cuneate, margin serrate to sparsely crenulate above middle or rarely entire, apex rounded. Inflorescences paniculate capitate corymbs, 1–2.3 × 1–2.4 cm, ca. 10-flowered; peduncle 5–13 mm, densely puberulent; bracts linear to lanceolate, 3–8 mm. Calyx cup-shaped, ca. 2.5 mm, outside pubescent and yellow glandular. Corolla purple in bud, white in bloom, slightly 2-lipped, 4-lobed, outside puberulent. Ovary 2-locular. Fruit ca. 5 × 4 mm. Fr. Jun.

Dry places; 200–1700 m. Hainan, W Yunnan [Bhutan, Cambodia, India, Laos, Myanmar, Nepal, New Guinea, Philippines, Thailand, Vietnam; Australia].

10. TSOONGIA Merrill, Philipp. J. Sci. 23: 264. 1923.

假紫珠属 jia zi zhu shu

Shrubs or small trees, erect; branchlets, petioles, and peduncles rust colored tomentose when young. Leaves opposite, simple, lobed, or palmately 3-foliolate; petiole long. Cymes axillary, lax, few flowered; peduncle shorter than petioles. Calyx small, campanulate, 2-lipped, lower lip 2-lobed, upper lip entire, outside glandular. Corolla weakly 2-lipped, with elongated tube, throat not bearded but with a ring of minute hairs near base; lobes 4 or 5, subequal, much shorter than tube. Stamens 4, didynamous, inserted at middle of corolla tube, slightly exserted. Ovary 2-locular; ovules 1 or 2 per locule. Style elongate; stigma slightly 2-cleft.

Monotypic: China, Myanmar, and Vietnam.

1. *Tsoongia axillariflora* Merrill, Philipp. J. Sci. 23: 264. 1923.

假紫珠 jia zi zhu

Tsoongia axillariflora var. *trifoliolata* H. L. Li.

Shrubs or small trees, 1–7 m tall. Branchlets purple-red, terete. Petiole 2–5.5 cm, pubescent, glandular; leaf blade elliptic to ovate-elliptic, 6–15 × 3–6.5 cm, submembranous, sparsely pubescent and glandular especially abaxially, base

broadly cuneate, margin entire, apex acuminate to acute; veins 4–7 pairs, abaxially prominent. Bracts and bractlets persistent. Calyx 2–3 mm. Corolla yellow, tube ca. 9 mm, outside glandular. Ovary apically densely yellow glandular. Fruit black-brown when mature, nearly ovoid, ca. 4 mm in diam., shiny, sparsely glandular. Fl. and fr. May–Sep.

Dense forests in mountain valleys; 900–1000 m. Guangdong, Guangxi, Hainan, SE Yunnan [Myanmar, Vietnam].

11. VITEX Linnaeus, Sp. Pl. 2: 638. 1753.

牡荆属 mu jing shu

Trees or shrubs. Branches glabrous or sparsely pubescent. Leaves opposite, palmately (1–)3–8-foliolate; leaflets petiolulate, margin entire, dentate, serrate, or incised. Inflorescences terminal or axillary cymes, thyrses, or panicles; bracts usually small, often early deciduous. Calyx campanulate, tubular, or funnelform, sometimes 2-lipped, usually truncate or shortly 5-dentate. Corolla blue, white, or yellow, 2-lipped, lower lip 3-lobed with middle lobe greatly elongated, upper lip usually 2-lobed. Stamens 4, didynamous, sometimes exserted; anther locules attached only at tip, becoming divaricate. Ovary 2–4-locular; ovules 1 or 2 per locule. Style filiform; stigma 2-cleft. Drupes subtended by enlarged calyx, globose, ovoid, or obovoid, normally 4-locular and 4-seeded but often some locules suppressed and base of pyrene forming a hollowed cavity, endocarp a bony pyrene, mesocarp generally fleshy. Seeds obovoid or oblong, endosperm absent; cotyledons usually fleshy.

About 250 species: chiefly tropical, few in temperate regions of both hemispheres; 14 species in China.

1a. Inflorescences axillary, subtended by normal leaves.

2a. Leaflets glabrous; inflorescences thyrses with a well-defined main axis and short lateral cymes 10. *V. peduncularis*

2b. Leaflets pubescent; inflorescences cymes, usually rounded.

3a. Leaves often with more than 3 leaflets; cymes to 3, produced in succession from 1 axil 11. *V. burmensis*

3b. Leaves always 3-foliolate; cymes rarely more than 1 per axil.

4a. Corolla yellow, tube slender and cylindric 12. *V. vestita*

4b. Corolla white flushed with pink or blue, tube funnelform to campanulate.

5a. Cyme branches narrowly divergent; corolla to 1.7 cm 13. *V. yunnanensis*

5b. Cyme branches widely divergent; corolla to 1 cm 14. *V. duclouxii*

1b. Inflorescences terminal, not subtended by normal leaves.

6a. Peduncles, pedicels, and calyces glabrous or subglabrous.

7a. Leaflets serrate; calyx distinctly dentate 3. *V. sampsonii*

7b. Leaflets entire; calyx teeth rudimentary.

8a. Branchlet lenticels obscure; corolla outside puberulent 1. *V. kwangsiensis*

8b. Branchlet lenticels conspicuous; corolla outside glabrescent 2. *V. tripinnata*

6b. Peduncles, pedicels, and calyces pubescent.

9a. Leaflets abaxially pubescent only along main veins.

10a. Leaflets lanceolate to oblong-lanceolate; bractlets persistent in flower 4. *V. pierreana*

10b. Leaflets obovate to elliptic or oblong; bractlets early deciduous 5. *V. quinata*

9b. Leaflets abaxially densely pubescent.

11a. Leaflets with glandular hairs, adaxially glabrescent and grayish dotted; bracts deciduous 6. *V. canescens*

11b. Leaflets puberulent, not adaxially dotted; bracts persistent.

12a. Prostrate shrubs 8. *V. rotundifolia*

12b. Erect shrub or small trees.

13a. Leaves (1–)3(–5)-foliolate; middle leaflet sessile; calyx with 5 obscure teeth, shorter than fruit

..... 7. *V. trifolia*

13b. Leaves 3–7-foliolate; middle leaflet distinctly petiolulate; calyx with 5 distinct teeth, as long as fruit 9. *V. negundo*

1. *Vitex kwangsiensis* P'ei, Mem. Sci. Soc. China 1(3): 93. 1932.

广西牡荆 *guang xi mu jing*

Trees. Branchlets grayish green, obscurely lenticellate. Leaves 2–5-foliolate; petiole 2–7 cm; petiolules 1–1.5 cm; leaflets ovate-lanceolate to ovate, abaxially bluish green, glabrous, and yellow glandular, adaxially green and glabrescent except pubescent along veins especially along midvein, base cuneate, margin entire, apex acuminate to caudate-acuminate; central leaflet 3–6.5 × 2–3.5 cm, lateral leaflets smaller. Panicles 6–10 cm; peduncle subglabrous. Calyx ca. 2.5 mm, minutely and regularly 5-dentate, outside glabrous and glandular. Corolla yellow; tube 3.5–6 mm, outside puberulent and glandular. Stamens exerted; filaments puberulent on basal half. Ovary glabrous. Style glabrous. Fruit globose. Fl. May–Jun, fr. Jul–Sep.

• Sparse forests on mountain slopes; 300–600 m. Guangxi (Longzhou Xian and Ningming Xian).

2. *Vitex tripinnata* (Loureiro) Merrill, Trans. Amer. Philos. Soc., n.s. 24(2): 335. 1935.

越南牡荆 *yue nan mu jing*

Tripinna tripinnata Loureiro, Fl. Cochinch. 2: 391. 1790; *Vitex annamense* Dop.

Shrubs or trees, 4–8 m tall. Branches gray-brown; branchlets black-purple when dry, conspicuously lenticellate. Leaves 3-foliolate; petiole 2–5 mm; petiolules 0.5–1.7 cm; leaflets narrowly elliptic, narrowly ovate, ovate, or obovate, glabrous, abaxially greenish and yellow glandular, base cuneate to subrounded, margin entire, apex acuminate to short caudate-acuminate; central leaflet 3–11 × 2–4 cm. Panicles 6–11 cm; branches dichotomous or trichotomous; peduncle 5–10 mm. Calyx 2–3 mm, minutely 5-dentate, subglabrous, yellow glandular. Corolla yellow to purplish; tube ca. 5 mm, outside subglabrous and glandular, villous in throat. Stamens exerted. Ovary glabrous. Fruit black when dry, globose, ca. 1 cm in diam. Fl. May, fr. Jun–Jul.

Forest edges on mountain slopes; 300–600 m. Hainan [Cambodia, Vietnam].

3. *Vitex sampsonii* Hance, J. Bot. 6: 115. 1868.

广东牡荆 *guang dong mu jing*

Shrubs 1–2 m tall. Branchlets sparsely pubescent to subglabrous; buds yellowish brown puberulent. Leaves 3–5-foliolate; petiole 1–3 cm; leaflets subsessile to very short petiolulate, elliptic-lanceolate, obovate-lanceolate, or obovate, base acuminate to cuneate, margin coarsely dentate with 1–5 teeth per side, apex acuminate, acute, or obtuse; central leaflet 1.5–4 × 1–2 cm. Panicles 10–20 cm. Calyx ca. 3 mm, teeth acuminate at maturity, both surfaces slightly pubescent to subglabrous. Corolla bluish purple, ca. 1 cm, both surfaces densely pubescent. Filaments pilose at base. Ovary apically with a few hairs. Fruiting calyx equal or longer than fruit. Fruit subglobose, ca. 3 mm in diam.

• Mountain slopes along roadsides; 400–600 m. Guangdong, Guangxi, Hunan, Jiangxi.

4. *Vitex pierreana* Dop, Bull. Soc. Hist. Nat. Toulouse 57: 205. 1928.

莺哥木 *ying ge mu*

Trees 6–15 m tall; bark gray-brown. Branchlets pilose to subglabrous. Leaves (3- or) 5-foliolate; petiole 2.5–7 cm, sparsely hairy; petiolules 5–15 mm; central leaflet lanceolate to oblong-lanceolate, 9–14 × 2.5–5 cm, glabrous except puberulent along midvein, abaxially yellow glandular, adaxially grayish, base cuneate to slightly decurrent, margin entire, apex acuminate. Panicles terminal, 13–20 cm; bracts linear, ca. 3 mm, pubescent. Calyx cup-shaped, ca. 2 mm, minutely 5-dentate, outside pubescent and glandular. Corolla yellowish white, 5–6 mm, outside puberulent and glandular. Filaments pilose at base. Ovary yellow glandular. Fruit black, obovoid to subglobose, glabrous, glandular. Fl. Mar–May, fr. May–Jul.

Mixed forests on mountain slopes; 300–500 m. Hainan [Laos, Vietnam].

5. *Vitex quinata* (Loureiro) Williams, Bull. Herb. Boissier, sér. 2, 5: 431. 1905.

山牡荆 *shan mu jing*

Trees 4–12 m tall, evergreen; bark brown. Branchlets pubescent and glandular when young, glabrescent. Leaves 3–5-foliolate; petiole 2.5–6 cm; petiolules 0.5–2 cm; leaflets obovate-elliptic to obovate or oblong to elliptic, thickly papery, both surfaces shiny, abaxially yellow glandular, base cuneate, margin entire or sometimes apically crenulate dentate, apex acuminate, acute, or obtuse; central leaflet 5–20 × 2.5–8.5 cm. Panicles terminal, lax, 9–18 cm, densely yellowish brown pubescent. Calyx 2–3 mm, rudimentarily dentate, densely yellowish brown pubescent, glandular. Corolla yellowish, 6–8 mm, 2-lipped, 5-lobed, outside pubescent and glandular. Stamens exerted. Ovary glandular. Fruiting calyx truncate. Fruit black, obovoid to globose, ca. 8 mm in diam. Fl. May–Jul, fr. Aug–Sep.

200–1700 m. Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hunan, Jiangxi, Taiwan, Xizang, Yunnan, Zhejiang [India, Indonesia, Japan, Malaysia, Philippines, Thailand].

- 1a. Filaments glabrous at base 5a. var. *quinata*
- 1b. Filaments distinctly pilose at base 5b. var. *puberula*

5a. *Vitex quinata* var. *quinata*

山牡荆 *shan mu jing*

Cornutia quinata Loureiro, Fl. Cochinch. 2: 387. 1790; *Vitex heterophylla* Roxburgh.

Central leaflet obovate-elliptic to obovate, 5–9 × 2.5–4 cm, adaxially subglabrous, with appressed hairs on midvein, and grayish dotted. Filaments widened and glabrous at base. Fl. May–Jul, fr. Aug–Sep.

Forests on mountain slopes; 200–1200 m. Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Taiwan, Zhejiang [India, Japan, Malaysia, Philippines].

5b. *Vitex quinata* var. *puberula* (H. J. Lam) Moldenke, Phytologia 3: 489. 1951.

微毛布惊 *wei mao bu jing*

Vitex heterophylla Roxburgh var. *puberula* H. J. Lam, Verben. Malay. Archip. 189. 1919.

Central leaflet oblong to elliptic, 15–20 × 5–8.5 cm, adaxially glabrescent. Filaments distinctly pilose at base.

Mixed forests on mountain slopes and along roadsides; 700–1700 m. Guangxi, Guizhou, Hainan, Taiwan, Xizang, Yunnan [Philippines, Thailand].

6. *Vitex canescens* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 42(2): 101. 1873.

灰毛牡荆 hui mao mu jing

Vitex kweichowensis Pei.

Trees 3–15(–20) m tall; bark black-brown. Branchlets densely gray-yellow pubescent. Leaves 3–5-foliolate; petiole (3.5–)7–10 cm; petiolules 0.5–3 cm; leaflets elliptic-lanceolate, elliptic, or ovate, 6–18 × 2.5–9 cm, papery, abaxially densely softly pubescent, sometimes glabrescent, and glandular, adaxially pubescent, base cuneate to subrounded and sometimes oblique, margin entire or obscurely undulate, apex acuminate to acute. Thyrses 10–30 cm; peduncle densely gray-yellow pubescent; bracts deciduous. Calyx minutely 5-dentate, outside densely pubescent and glandular, inside pubescent. Corolla yellowish, outside densely pubescent and glandular, pilose at insertion of stamens. Stamens exserted. Ovary apically glandular. Style glabrous. Drupes yellow, becoming black, globose, shiny, smooth.

Mixed forests; 200–1600 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Xizang, Yunnan [Cambodia, India, Laos, Malaysia, Myanmar, Thailand, Vietnam].

Medicinal, timber.

7. *Vitex trifolia* Linnaeus, Sp. Pl. 2: 638. 1753.

蔓荆 man jing

Shrubs or small trees, 1.5–5 m tall, erect. Branchlets densely pubescent. Leaves 1–3(–5)-foliolate; petiole 1–3 cm; leaflets sessile, oblong, lanceolate, or obovate, abaxially densely gray tomentose, adaxially green and glabrous or subglabrous, base cuneate, margin entire, apex obtuse, veins ca. 8 pairs and slightly prominent on both surfaces; central or single leaflet 2.5–9 × 1.7–3 cm. Panicles 3–15 cm; peduncle densely gray tomentose. Calyx slightly 5-dentate, outside gray pubescent, inside glabrous. Corolla purplish to bluish purple, 6–10 mm, outside scaly white, pubescent at filament bases and on inside of lower lobe. Stamens exserted. Ovary glabrous, with or without glands. Style glabrous. Fruit black, subglobose, ca. 5 mm in diam. Fl. Apr–Aug, fr. Aug–Nov.

100–1700 m. Anhui, Fujian, Guangdong, Guangxi, Hebei, Jiangsu, Jiangxi, Liaoning, Shandong, Taiwan, Yunnan, Zhejiang [S and SE Asia, Australia, Pacific Islands].

1a. Ovary without glands 7c. var. *taihangensis*
1b. Ovary glandular.

2a. Leaves usually 3(–5)-foliolate 7a. var. *trifolia*

2b. Leaves both simple and compound
..... 7b. var. *subtrifecta*

7a. *Vitex trifolia* var. *trifolia*

蔓荆 man jing

Vitex bicolor Willdenow; *V. negundo* Linnaeus var. *bicolor* (Willdenow) H. J. Lam; *V. trifolia* var. *bicolor* (Willdenow) Moldenke; *V. trifolia* var. *trifoliolata* Schauer.

Leaves 3(–5)-foliolate; middle leaflet 5–9 × 1.7–3 cm. Fl. Jul, fr. Sep–Nov.

Open places or along river banks; 100–400 m. Fujian, Guangdong, Guangxi, Taiwan, Yunnan [SE Asia, Australia, Pacific Islands].

7b. *Vitex trifolia* var. *subtrifecta* (Kuntze) Moldenke, Phytologia 8: 88. 1961.

异叶蔓荆 yi ye man jing

Vitex agnuscastus Linnaeus var. *subtrifecta* Kuntze, Revis. Gen. Pl. 2: 510. 1891.

Shrubs, erect. Leaves both simple and compound; compound leaves usually 3-foliolate. Fl. Apr–Jul, fr. Sep–Nov.

Mixed forests on mountain slopes and along roadsides; 300–1700 m. Guangdong, S Yunnan [S and SE Asia, Australia, Pacific Islands].

7c. *Vitex trifolia* var. *taihangensis* (L. B. Guo & S. Q. Zhou) S. L. Chen, Novon 1: 58. 1991.

太行荆 tai hang jing

Vitex taihangensis L. B. Guo & S. Q. Zhou, Bull. Bot. Res., Harbin 9(4): 61. 1989.

Shrubs, erect, 40–90 cm tall. Leaves simple or rarely compound; blade lanceolate to ovate-lanceolate. Ovary glabrous, without glands. Fl. Aug.

• Mountain slopes in calcareous soil; 1400 m. Shanxi (Taihang Shan).

8. *Vitex rotundifolia* Linnaeus f., Suppl. Pl. 294. 1781 (publ. 1782).

单叶蔓荆 dan ye man jing

Vitex ovata Thunberg; *V. trifolia* var. *ovata* (Thunberg) Makino; *V. trifolia* var. *simplicifolia* Chamisso; *V. trifolia* var. *unifoliolata* Schauer.

Shrubs, prostrate. Stems prostrate to creeping, rooting at nodes; branchlets silky tomentose when young. Leaves mostly 1(–3)-foliolate, sessile or short petiolate; blade obovate-spatulate, ovate-elliptic, broadly oblong-elliptic, or circular, 2.5–5 × 1.5–3 cm, abaxially velvety to minutely silky tomentose, adaxially usually pale dull green and pubescent, base attenuate to rounded, margin entire, apex abruptly subacuminate to rounded. Inflorescences terminal thyrses, 3–10 × 1–2.5 cm. Calyx cup-shaped, 4–5 mm, slightly 2-lipped, 5-denticulate, outside minutely silky tomentose and glandular, inside glabrous. Corolla purplish mauve to lilac blue, salverform, outside minutely silky tomentose and glandular, villous in tube and inside on lower half of large anterior lobe of lower lip. Stamens and style exserted. Ovary globose, glabrous, densely glandular. Fruit dark brown when dry, globose. Fl. Jul–Sep, fr. Sep–Nov.

Open sandy areas, usually near sea. Anhui, Fujian, Guangdong, Hebei, Jiangsu, Jiangxi, Liaoning, Shandong, Taiwan, Zhejiang [Japan; SE Asia, Pacific Islands].

Medicinal.

9. *Vitex negundo* Linnaeus, Sp. Pl. 2: 638. 1753.

黄荆 huang jing

Shrubs or small trees. Branchlets densely gray tomentose. Leaves 3–7-foliolate; central leaflet distinctly petiolulate. Calyx campanulate, 5-dentate, gray tomentose. Corolla

2-lipped, 5-lobed, outside puberulent. Stamens exerted. Ovary subglabrous.

100–3200 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Japan; E Africa, S and SE Asia, Pacific Islands].

Fiber, medicinal.

- 1a. Leaflets distinctly serrate.
- 2a. Leaflets regularly serrate, abaxially sparsely pubescent 9d. var. *cannabifolia*
- 2b. Leaflets irregularly serrate, abaxially densely gray tomentose 9e. var. *heterophylla*
- 1b. Leaflets entire, rarely sparsely serrate.
- 3a. Inflorescences racemelike thyrses, ultimate cymes lax 9c. var. *thyrsoides*
- 3b. Inflorescences spikelike thyrses, ultimate cymes compact.
- 4a. Central leaflet 4–13 × 1–4 cm ... 9a. var. *negundo*
- 4b. Central leaflet 1.5–4 × 0.5–1 cm 9b. var. *microphylla*

9a. *Vitex negundo* var. *negundo*

黄荆 huang jing

Vitex arborea Fischer; *V. negundo* f. *alba* P'ei; *V. negundo* f. *laxipaniculata* P'ei; *V. paniculata* Lamarck.

Leaves usually (3–)5-foliolate; leaflets lanceolate, oblong-lanceolate, broadly lanceolate, or ovate, abaxially scaly white, adaxially green or scaly white, base cuneate, margin entire or rarely with 1–3 teeth along apical part; central leaflet 4–13 × 1–4 cm. Inflorescences 10–27 cm; peduncle densely gray tomentose. Fl. Apr–Jun, fr. Jul–Oct.

Mixed thickets on mountain slopes; 200–1400 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Qinghai, Shaanxi, Sichuan, Taiwan, Xizang, Yunnan, Zhejiang [Japan; E Africa, S and SE Asia, Pacific Islands].

9b. *Vitex negundo* var. *microphylla* Handel-Mazzetti, Symb. Sin. 7: 906. 1936.

小叶荆 xiao ye jing

Vitex microphylla (Handel-Mazzetti) P'ei ex C. Y. Wu.

Leaves (3–)5(–7)-foliolate; leaflets elliptic-lanceolate, abaxially scaly white, adaxially green, base cuneate, margin entire, apex acuminate; middle leaflet 1.5–4 × 0.5–1 cm. Inflorescences 5–11 cm. Fruit pubescent. Fl. and fr. Jul–Nov.

• Thickets along stream banks; 1200–3200 m. Sichuan, Xizang, Yunnan.

9c. *Vitex negundo* var. *thyrsoides* P'ei & S. L. Liou in S. L. Liou, Fl. Reipubl. Popularis Sin. 65(1): 212. 1982.

拟黄荆 ni huang jing

Leaves 3–5-foliolate; leaflets lanceolate to narrowly elliptic, abaxially gray tomentose, adaxially sparsely pubescent or only pubescent along veins. Inflorescences large, lax, racemelike thyrses. Fl. and fr. Aug–Oct.

• Mixed forests on mountain slopes; 300–2100 m. Guangdong, Sichuan.

9d. *Vitex negundo* var. *cannabifolia* (Siebold & Zuccarini) Handel-Mazzetti, Acta Horti Gothob. 9: 67. 1934.

牡荆 mu jing

Vitex cannabifolia Siebold & Zuccarini, Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 4(3): 152. 1846; *V. negundo* f. *intermedia* P'ei.

Shrubs or small trees. Leaves (3–)5-foliolate; leaflets lanceolate to elliptic-lanceolate, abaxially greenish, minutely pilose, adaxially green, base cuneate, margin regularly coarse serrate, apex acuminate. Panicles 10–20 cm. Corolla purplish. Fruit black, globose. Fl. Jun–Jul, fr. Aug–Nov.

Mixed thickets on mountain slopes and along roadsides; 100–1100 m. Guangdong, Guangxi, Guizhou, Hebei, Henan, Hunan, Sichuan [India, Nepal; SE Asia].

9e. *Vitex negundo* var. *heterophylla* (Franchet) Rehder, J. Arnold Arbor. 28: 258. 1947.

荆条 jing tiao

Vitex incisa Lamarck var. *heterophylla* Franchet, Nouv. Arch. Mus. Hist. Nat., sér. 2, 6: 112. 1883; *V. chinensis* Miller; *V. incisa* Lamarck; *V. negundo* var. *incisa* (Lamarck) C. B. Clarke.

Leaflets deeply incised, essentially pinnatifid, abaxially densely gray tomentose.

Mixed thickets on mountain slopes and along roadsides; 200–1800 m. Anhui, Gansu, Guizhou, Hebei, Henan, Hunan, Jiangsu, Jiangxi, Nei Mongol, Ningxia, Shaanxi, Shandong, Shanxi, Sichuan [India; SE Asia].

10. *Vitex peduncularis* Wallich ex Schauer in A. de Candolle, Prodr. 11: 687. 1847.

长序荆 chang xu jing

Trees 5–15 m tall. Branchlets sparsely pubescent when young, glabrescent. Leaves 3-foliolate; petiole 4–7 cm; petiolules 5–12 mm; leaflets broadly lanceolate to oblong, glabrous, abaxially densely glandular, base cuneate and slightly oblique, margin entire or slightly undulate and ciliate, apex acuminate to acute; central leaflet 10–15 × 4–5 cm. Thyrses 7–17 cm; bracts linear, early deciduous. Calyx 1.8–2.5 cm, outside pubescent and glandular, inside glabrous. Corolla white, outside puberulent, lower lip pilose inside. Stamens included; filaments glabrous. Ovary glabrous. Fruiting calyx minutely 5-dentate to subtruncate. Fruit black, subglobose, ca. 7 mm in diam., with longitudinal veins when dry. Fl. and fr. Jul–Aug.

Mixed forests; 600–1200 m. S Yunnan [Bangladesh, Cambodia, India, Laos, Myanmar, Nepal, Thailand, Vietnam].

11. *Vitex burmensis* Moldenke, Phytologia 8: 30. 1961.

长叶荆 chang ye jing

Vitex lanceifolia S. C. Huang; *V. lanceolata* P'ei (1932), not Turczaninow (1863).

Shrubs or trees 2–12 m tall. Branches and branchlets pubescent, densely yellowish glandular. Leaves 3–5-foliolate; petioles 2–12 cm; petiolules 0.3–2 cm; leaflets oblong, lanceolate, or ovate-lanceolate, papery, abaxially yellow glandular, adaxially sparsely pubescent and glandular, base cuneate to subrounded and sometimes oblique, margin entire, apex caudate-acuminate to acute, veins 13–15 pairs and abaxially prominent; central leaflet 7–17 × 2.5–8 cm. Panicles axillary, 1–3 per axil; peduncle 1.5–7 cm, densely short pubescent, sparsely glandular. Calyx slightly 2-lipped, 5-dentate, outside pubescent and glandular, inside glabrous.

Corolla pink, ca. 1 cm, tube ca. 6 mm, both surfaces pubescent especially on central lobe of lower lip. Stamens slightly exerted; filaments pubescent on basal half; anthers divaricate. Ovary glabrous, apically glandular. Style as long as corolla tube. Fruit globose, ca. 1 cm in diam. Fl. Jun, fr. Oct.

Dense forests in moist valleys; 1300–2400 m. Guangxi, Guizhou, Xizang, Yunnan [Myanmar].

12. *Vitex vestita* Wallich ex Schauer in A. de Candolle, Prodr. 11: 692. 1847.

黄毛牡荆 huang mao mu jing

Shrubs or small trees, 1–5(–8) m tall. Branchlets densely yellow-brown pubescent when young, glabrescent. Leaves 3-foliolate; petiole 2–6 cm; petiolules ca. 1 cm; leaflets elliptic-oblong to elliptic, membranous, abaxially softly tawny pubescent villous on veins and glandular, adaxially sparsely hispid and glandular dotted, base cuneate to rounded, margin entire or sparsely serrate above middle, apex acuminate to acute; central leaflet largest, 2.5–15 × 1.5–8 cm. Cymes axillary, sometimes to 3 per axil, 2.5–4 cm, dichotomous or trichotomous, tawny pubescent; peduncle shorter than petioles, densely pilose; bracts linear, pilose. Calyx with a tube ca. 3 mm, minutely 5-dentate to subtruncate, outside densely pubescent and glandular. Corolla yellowish, tube slender and 1–1.2 cm, outside yellow glandular, inside glabrous except villous below insertion of stamens. Stamens included. Ovary apex densely glandular. Fruiting calyx enlarged, saucer-shaped. Drupes black, obovoid, 5–9 × 4–8 mm. Fl. Jun–Sep, fr. Oct–Nov.

Mixed forests on mountain slopes; 800–1800 m. Yunnan [SE Asia].

Some Chinese collections are described as having white or pink flowers.

13. *Vitex yunnanensis* W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 141. 1916.

滇牡荆 dian mu jing

Shrubs or small trees, 1–5 m tall. Branchlets and peduncles densely minutely tomentose when young, subglabrescent. Leaves 3–5-foliolate; petiole 1–6 cm, yellow-brown minutely tomentose; petiolules 2–4 mm; leaflets elliptic-oblong, ovate-oblong, or ovate, abaxially greenish to yellowish green and yellow glandular pilose on veins, adaxially green and sparsely yellow glandular pubescent on veins, base broadly cuneate to subrounded, margin subentire and usually ciliate, apex acuminate, acute, or obtuse; central leaflet 2.5–5.5 cm. Cymes 3–7-flowered; peduncle shorter than petioles. Calyx campanulate, ca. 3 mm, minutely 5-dentate, teeth broadly triangular, outside pilose and glandular. Corolla white flushed with pink or blue, to 1.7 cm; tube ventricose, outside puberulent and glandular, villous at insertion of filaments. Stamens slightly exerted. Ovary and style glabrous. Fruit globose, ca. 1 cm in diam. Fl. and fr. May–Nov.

• Mixed forests on mountain slopes; 1800–3500 m. Sichuan, Yunnan.

14. *Vitex duclouxii* Dop, Bull. Soc. Hist. Nat. Toulouse 57: 208. 1928.

金沙荆 jin sha jing

Shrubs or trees; bark dark brown. Branchlets glandular yellow-brown pubescent when young, glabrescent. Leaves (3–)5-foliolate; petiole 2–6 cm; petiolules 1–1.5 cm; leaflets oblong-lanceolate, abaxially pilose on veins densely so when young, adaxially subglabrous, both surfaces yellowish glandular, base cuneate and slightly oblique, margin entire, apex acuminate to nearly caudate; central leaflet 5–10 × 2–3 cm. Cymes dichotomous, pubescent to subglabrous; bracts small. Calyx campanulate, ca. 4 mm, outside pubescent and densely glandular; teeth 5, triangular. Corolla ca. 1 cm, 2-lipped, tube ca. 6 mm, lower lip 3-lobed, upper lip 2-lobed and larger than lower lip, outside puberulent and glandular except at base, inside puberulent on lower lip and villous at insertion of filaments. Stamens included. Ovary glabrous. Style as long as stamens. Fruit globose, ca. 1 cm in diam.

• Thickets along streams; 1000–2300 m. Sichuan, Xizang (Médog), Yunnan.

12. GMELINA Linnaeus, Sp. Pl. 2: 626. 1753.

石梓属 shi zi shu

Trees, tall shrubs, or rarely subshrubs, often climbing when young. Branchlets tomentose, often spiny. Leaves opposite, simple, sometimes lobed, usually with large gland patches near base, often abaxially gray mealy. Inflorescences usually terminal cymes or panicles, sometimes 1-flowered in leaf axils; cymules axillary, decussate, few flowered, short; bracts leaflike. Calyx persistent, campanulate, enlarged in fruit, truncate, 4- or 5-dentate or lobed, often somewhat unequal or oblique, usually with large glands. Corolla zygomorphic, ventricose funnelform, tube narrow at base, throat wide; limb oblique, ca. 2-lipped, upper lip 2-lobed or entire, lower lip 3-lobed with middle lobe larger. Stamens 4, distinctly didynamous, inserted on basal part of corolla tube, usually included, sometimes slightly exerted; anthers divaricate, opening by longitudinal slits. Ovary (2–)4-locular; ovules pendulous or laterally attached, often with a central cavity. Style slender, usually unequally 2-lobed or stigma awl-shaped. Fruit a succulent drupe, endocarp bony, mesocarp fleshy. Seeds 4 or by abortion 2 or 3.

About 35 species: Asia, Australia, and New Guinea; seven species in China.

- 1a. Bracts rounded to broadly ovate, persistent 1. *G. szechwanensis*
 1b. Bracts linear, lanceolate, to ovate, deciduous before anthesis.
 2a. Calyx distinctly dentate or lobed.
 3a. Subshrubs or shrubs; branchlets slender; leaf blade 1.5–2.5(–5) cm 2. *G. delavayana*
 3b. Trees; branchlets robust; leaf blade more than 5 cm.
 4a. Calyx 1.5–1.8 cm, teeth ovate-triangular; ovary mealy; fruit shorter than calyx 3. *G. hainanensis*
 4b. Calyx 0.3–0.5 cm, teeth sharply triangular; ovary glabrous; fruit much longer than calyx 4. *G. arborea*
 2b. Calyx truncate.
 5a. Climbing shrubs; branchlets with axillary spines; ovary glabrous 5. *G. asiatica*

5b. Trees; branchlets without spines; ovary pubescent or mealy.

- 6a. Leaves glabrous; corolla 4-lobed, glabrous 6. *G. chinensis*
6b. Leaves densely puberulent; corolla 5-lobed, puberulent 7. *G. lecomtei*

1. *Gmelina szechwanensis* K. Yao in S. L. Chen & K. Yao, Fl. Reipubl. Popularis Sin. 65(1): 211. 1982.

四川石梓 *si chuan shi zi*

Trees ca. 12 m tall, deciduous; bark dark brown. Branchlets terete, slender, striate, with elliptic white lenticels, leaf scars prominent, white puberulent when young, glabrescent. Petiole 2–5 cm, puberulent; leaf blade ovate to obovate, 5–9 × 4–6.5 cm, papery, abaxially grayish green, sparsely puberulent, and densely glandular, adaxially glabrous, base cuneate to broadly cuneate and oblique, margin entire, apex obtuse to acuminate, veins 3 or 4 pairs. Inflorescences terminal; peduncle densely grayish puberulent; bracts persistent, with petioles ca. 5 mm, blade rounded to broadly ovate, 1–2 × 1–1.5 cm, outside densely puberulent and glandular, inside sparsely puberulent. Calyx unequally 4- or 5-dentate, outside sparsely puberulent, inside glabrous in fruit. Ovary ovoid, glabrous. Fruit black when dry, obovoid, 1–1.5 cm in diam., shorter than persistent calyx.

• Mixed forests on mountain slopes and along streams; 1200–3000 m. SW Sichuan.

Described from fruiting material. Allied to *Gmelina delavayana* but differs in having bracts and bractlets persistent, broadly ovate to rounded, and densely puberulent and calyces much longer than fruit. *Gmelina hainanensis* can have a similar calyx to *G. szechwanensis*, and these species need further study.

2. *Gmelina delavayana* Dop, Bull. Soc. Bot. France 61: 321. 1914.

小叶石梓 *xiao ye shi zi*

Gmelina montana W. Smith.

Subshrubs to shrubs, 0.3–3 m tall. Branchlets terete, slender, striate, with sparse small lenticels, puberulent when young, glabrescent. Petiole 3–8 mm; leaf blade broadly ovate to ovate-rhomboid, 1.5–2.5(–5) cm, abaxially glandular, adaxially glabrous, base cuneate to broadly cuneate and slightly oblique, margin entire or coarsely serrate below middle, apex acuminate, veins 3 or 4 pairs. Inflorescences lax terminal thyrses, terminal flowers solitary, basal bracts leaflike, bractlets lanceolate. Calyx campanulate, 6–8 mm, 5-dentate, grayish glandular, outside with several disc-shaped black glands. Corolla bluish to reddish purple, base yellow, 3–4 cm, 2-lipped; lower lip 3-lobed, central lobe largest, hooded; upper lip entire or slightly 2-cleft, puberulent. Stamens slightly exerted. Ovary glabrous, sparsely glandular. Style ± as long as stamens, glabrous. Fruit black when dry, obovoid, 1–1.5 cm, longer than persistent calyx. Fl. May–Jul, fr. Jul–Sep.

• Thickets on mountain slopes; 1500–3000 m. SW Sichuan, NW Yunnan.

3. *Gmelina hainanensis* Oliver, Hooker's Icon. Pl. 19: t. 1874. 1889.

苦梓 *ku zi*

Trees ca. 15 m tall; bark gray. Branchlets yellowish, leaf scars and lenticels very prominent, pubescent when young, glabrescent; buds brownish woolly. Petiole brown, 2–4(–6.5) cm, pubescent; leaf blade ovate to broadly ovate, 5–16 × 4–8 cm, papery, abaxially bluish green mealy, adaxially shiny green and glabrous, base cuneate to truncate, apex short

acuminate to acute; veins 3 or 4 pairs, abaxially prominently elevated. Inflorescences terminal, cymose paniculate; peduncle 6–8 cm, yellowish pubescent; bracts sessile, leaflike, ovate-lanceolate to ovate, 0.8–1 × 0.5–2.5 cm, gray pubescent, with circular gland patches. Calyx 1.5–1.8 cm, 2-lipped, outside pubescent and glandular, accrescent and spreading in fruit; teeth 5, ovate-triangular. Corolla pinkish white, red, or rarely yellowish, darker in center, 3.5–4.5 cm, tube ca. 2.5 cm. Stamens sparsely glandular. Ovary pubescent. Fruit ovoid, 2–2.2 × 1.5 cm, as long as fruiting calyx. Fl. May–Jun, fr. Jun–Sep.

Open grassy hillsides, sparse forests; 300–500 m. Guangdong, Guangxi, Hainan, S Jiangxi [Vietnam].

Fine timber.

4. *Gmelina arborea* Roxburgh, Pl. Coromandel 3: 41. 1815.

云南石梓 *yun nan shi zi*

Trees ca. 15 m tall; bark grayish brown; branchlets, petioles, and inflorescences densely yellow-brown tomentose. Branchlets slightly 4-angled when young, becoming terete, lenticellate, leaf scars prominent. Petiole terete, 3.5–10 cm; leaf blade broadly ovate, 8–19 × 4.5–15 cm, thickly papery, base broadly cuneate to subcordate, apex acuminate; veins 3–5 pairs, abaxially prominent. Inflorescences terminal, narrow thyrses; peduncle 15–30 cm. Calyx 3–5 mm, with several black discoid gland patches; teeth 5, sharply triangular. Corolla yellow, 3–4 cm, 2-lipped, sparsely glandular; lower lip 3-lobed, outside yellowish brown puberulent, inside glabrous; upper lip entire or slightly 2-cleft. Ovary glabrous, glandular. Stigma unequally 2-cleft. Drupes yellow when ripe and black when dry, ellipsoid to obovoid-ellipsoid, 1.5–2 cm. Fl. Apr–May, fr. May–Jul.

Open forests along roadsides and near farm houses; below 1500 m. S Yunnan [Bangladesh, Bhutan, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam].

Allied to *Gmelina asiatica* but differs in having erect inflorescences and larger leaves.

5. *Gmelina asiatica* Linnaeus, Sp. Pl. 2: 626. 1753.

亚洲石梓 *ya zhou shi zi*

Shrubs, climbing, 1–3(–10) m tall, usually with spines and minute yellowish brown hairs on young shoots. Petiole 0.5–4.5 cm; leaf blade ovate to obovate, 3–5(–9) × 2.2–3(–8.5) cm, papery, abaxially dark brown villous and glandular, adaxially glabrescent, base cuneate, margin entire or ca. 3–5-lobed, apex acuminate, veins 3 or 4 pairs. Inflorescences terminal, usually pendulous, few to many flowered; primary floral branches very short, 1–5-flowered; bracts leaflike, small to large. Flowers pendulous. Calyx 3–6 × 2.5–4 mm, outside densely dark brown pubescent and with 2 to several disc-shaped glands, inside glabrous. Corolla yellow, 2–5 cm, 2-lipped and 4-lobed, lower lip 3-lobed, upper lip entire, outside with scattered appressed hairs, inside with dense glandular hairs. Filaments with dense glandular hairs. Ovary 4-locular, glabrous. Style slender, hardly exerted, apically curved; stigma unequally 2-cleft. Drupes yellow, ovoid to obovoid, glabrous.

Mixed forests; 400–800 m. Guangdong, S Guangxi [Bangladesh, Cambodia, India, Indonesia, Malaysia, Myanmar, Sri Lanka, Thailand, Vietnam].

Differs from other species in its climbing habit, branch spines, small leaves, and long narrow corollas.

6. *Gmelina chinensis* Benth. Fl. Hongk. 272. 1861.

石梓 shi zi

Trees or shrubs, 3–12 m tall; bark gray. Branchlets yellow-brown pubescent when young, glabrescent. Petiole 2–5.5 cm, channeled, pubescent when young, glabrescent; leaf blade ovate-elliptic to ovate, 5–15 × 3–7(–9) cm, papery to thickly papery, abaxially bluish green mealy with gland patches scattered to almost absent, adaxially glabrous, base cuneate, margin entire, apex acuminate, veins 3–5 pairs. Inflorescences terminal thyrses; bracts leaflike, deciduous. Calyx truncate, 5–12 mm, outside densely gray downy and with several disc-shaped glands, inside glabrous and sparsely glandular. Corolla white or pinkish, 3–3.5 cm, throat ca. 2.5 cm in diam., outside densely glandular, inside sparsely glandular. Ovary apically densely pubescent, basally glabrous. Drupes obovoid, ca. 2.2 × 1.5 cm, apex truncate. Fl. Apr–May, fr. Aug.

• Mixed forests on mountain slopes; 500–1200 m. Fujian, Guangdong, Guangxi, Guizhou.

7. *Gmelina lecomtei* Dop, Bull. Soc. Bot. France 61: 322. 1914.

越南石梓 yue nan shi zi

Trees ca. 15 m tall. Branchlets 4-angled and densely yellow pubescent when young, becoming terete and glabrous, sparsely lenticellate. Petiole terete, 6–7 cm, channeled, yellow puberulent; leaf blade ovate-elliptic to ovate, 9–20 × 6–12 cm, abaxially bluish green, yellowish brown puberulent, and gray glandular, adaxially subglabrous except pubescent along veins, base broadly cuneate to subrounded, margin entire, apex acuminate to acute; veins 3 or 4 pairs, abaxially very prominent, reticulate, adaxially pitted. Inflorescences terminal cymose panicles, cymes narrowly divergent, proximal cymes as long as panicle; bracts deciduous, linear to linear-lanceolate, 5–7 mm, densely puberulent, black disc-shaped glandular. Calyx cup-shaped, almost rotate in fruit, 5–8 mm. Corolla yellow, ca. 3 cm; lobes 5, equal, rounded. Stamens slightly exerted. Ovary ovoid, pubescent. Style sparsely glandular. Fruit obovoid, 2.5–4 cm, fleshy. Fl. Jun–Jul, fr. Jul–Sep.

Open forests; 200–1000 m. Yunnan (Hekou Xian and Pingbian Xian) [Laos, Vietnam].

13. *GARRETTIA* Fletcher, Bull. Misc. Inform. Kew 1937: 71. 1937.

辣蕈属 la you shu

Shrubs. Leaves opposite, simple or 3-lobed. Cymes usually axillary, with monochasial branches. Flowers minute. Calyx campanulate, minutely 5-dentate or subtruncate. Corolla 2-lipped, lower lip 3-lobed, upper lip usually 2-lobed, lobes entire. Stamens didynamous, shorter or longer than corolla. Ovary 2-locular when young, becoming 4-locular; ovules 1 per locule. Stigma 2-cleft. Fruiting calyx inflated. Schizocarp globose, reticulately ridged, breaking into 4 mericarps each enclosing 1 seed.

One or two species: SE Asia, one species in China.

1. *Garrettia siamensis* Fletcher, Bull. Misc. Inform. Kew 1937: 71. 1937.

辣蕈 la you

Shrubs 1–1.5(–4) m tall. Branchlets 4-angled and brown puberulent when young, becoming terete and glabrous. Petiole 1.5–5 cm, puberulent; leaf blade ovate, 4.5–8 × 2–4 cm, papery, abaxially greenish, adaxially green, both surfaces puberulent and golden glandular especially abaxially, base rounded to slightly cordate, margin serrulate, apex acuminate,

veins 4–6 pairs. Cymes with up to 4 monochasial branches; peduncle 1–1.5 cm; bracts linear-lanceolate. Calyx ca. 1.5 mm, membranous. Corolla with a tube 1.5–2 mm, 2-lipped, lower lip ca. 2 mm, upper lip ca. 1 mm, pilose at insertion of filaments. Stamens slightly exerted. Schizocarp globose, 1.5–2 mm in diam., densely yellow glandular, surface reticulate, apex truncate, flattened.

Open forests on mountain slopes in calcareous soil; 600–1200 m. SE Yunnan [Indonesia, Thailand].

14. *CLERODENDRUM* Linnaeus, Sp. Pl. 2: 637. 1753.

大青属 da qing shu

Shrubs or small trees, rarely subshrubs or herbs, erect or rarely climbing, deciduous or evergreen. Branchlets usually 4-angled when young. Leaves simple, opposite or rarely whorled. Inflorescences loosely cymose or capitate, in terminal or rarely axillary paniculate thyrses. Calyx campanulate or cup-shaped, ca. 5-dentate or deeply 5-lobed. Corolla with a slender tube; lobes 5, spreading. Stamens 4, ± exerted. Ovary 4-locular; ovules pendulous or laterally attached. Style with 2 acute stigmatic lobes. Fruiting calyx ± inflated. Fruit a drupe with 4 1-seeded pyrenes, sometimes separating into 2 2-loculed or 4 1-locular mericarps.

About 400 species: mostly tropical and subtropical, few in temperate Asia, Africa, and America; 34 species in China.

1a. Corolla tube 5 cm or longer; leaves in whorls of 3–5 1. *C. indicum*

1b. Corolla tube less than 5 cm; leaves opposite, rarely in whorls of 3.

2a. Calyx truncate or subtruncate at anthesis.

3a. Subshrubs 0.3–0.5 m tall; leaf blade membranous; calyx ca. 2 mm; corolla tube ca. 5 mm, lobes ca. 5 mm

..... 33. *C. subscaposum*

- 3b. Shrubs 1–4 m tall; leaf blade papery; calyx ca. 5 mm; corolla tube ca. 7 mm, lobes 6–12 mm 34. *C. serratum*
- 2b. Calyx 5-lobed or 5-dentate at anthesis.
- 4a. Inflorescences 3–10-flowered.
- 5a. Corolla tube equal or slightly longer than calyx; calyx lobes triangular-ovate to broadly ovate 10. *C. fortunatum*
- 5b. Corolla tube much longer than calyx; calyx lobes triangular-lanceolate.
- 6a. Leaf blade papery; inflorescences terminal; calyx deeply lobed, lobes ca. 1 cm, triangular-lanceolate 31. *C. griffithianum*
- 6b. Leaf blade thick papery; inflorescences axillary or rarely subterminal; calyx dentate or subtruncate in fruit 32. *C. inerme*
- 4b. Inflorescences more than 10-flowered.
- 7a. Leaf blade abaxially with numerous peltate glands usually covered with a sand-colored secretion.
- 8a. Leaf blade shallowly palmately 3–5-lobed 4. *C. paniculatum*
- 8b. Leaf blade not lobed.
- 9a. Stamens ca. 2 cm 2. *C. intermedium*
- 9b. Stamens 4.5–7.5 cm 3. *C. japonicum*
- 7b. Leaf blade abaxially with few or no peltate glands.
- 10a. Leaf blade 2–3 × as long as wide.
- 11a. Inflorescences capitate or flat-topped cymes with a short axis.
- 12a. Leaf blade densely yellow glandular on both surfaces 11. *C. luteopunctatum*
- 12b. Leaf blade without glands or glands only on 1 surface.
- 13a. Inflorescences capitate, ca. 5.5 cm; calyx lobes lanceolate, reflexed at anthesis 12. *C. ervatamioides*
- 13b. Inflorescences flat-topped, 7–16 cm; calyx lobes triangular-lanceolate, erect at anthesis.
- 14a. Leaf blade papery; corolla tube ca. 1 cm; calyx 3–4 mm 13. *C. cyrtophyllum*
- 14b. Leaf blade membranous; corolla tube 2–3 cm; calyx 6–7 mm 14. *C. kwangtungense*
- 11b. Inflorescences thyrsoïd with an elongated axis.
- 15a. Branchlets 4-angled, winged 5. *C. wallichii*
- 15b. Branchlets terete or slightly 4-angled, not winged.
- 16a. Inflorescences more than 15 cm; leaf blade usually membranous 9. *C. longilimbum*
- 16b. Inflorescences less than 15 cm; leaf blade usually papery.
- 17a. Leaf pairs with unequal blades and petioles 6. *C. garrettianum*
- 17b. Leaf pairs with equal blades and petioles.
- 18a. Leaves black when dry; inflorescences slightly pendulous, racemously arranged thyrses; calyx lobes ovate-oblong 7. *C. henryi*
- 18b. Leaves green when dry; inflorescences thyrsoïd cymes; calyx lobes triangular-lanceolate 8. *C. hainanense*
- 10b. Leaf blade less than to 2 × as long as wide.
- 19a. Cymes not crowded.
- 20a. Inflorescences without a distinct axis.
- 21a. Leaf blade adaxially sparsely pubescent to subglabrous, abaxially puberulent; calyx densely pubescent; corolla lobes without glands 24. *C. colebrookianum*
- 21b. Leaf blade adaxially sparsely strigose, abaxially strigose only on veins; calyx puberulent; corolla lobes glandular outside 25. *C. kaichianum*
- 20b. Inflorescences with a distinct axis.
- 22a. Inflorescences rounded 26. *C. villosum*
- 22b. Inflorescences flat topped.
- 23a. Calyx 3–6 mm, teeth awl-shaped or narrowly triangular.
- 24a. Leaf blade papery, abaxially densely glandular; calyx ca. 6 mm, teeth narrowly triangular 27. *C. kiangsiense*
- 24b. Leaf blade subleathery, abaxially without glands; calyx 3–4 mm, teeth awl-shaped 28. *C. mandarinorum*
- 23b. Calyx 11–15 mm, teeth ovate-elliptic or ovate.
- 25a. Branchlets, petioles, and peduncles densely tomentose and glandular; stamens equal to or slightly longer than corolla tube; style slightly longer than stamens 29. *C. brachystemon*
- 25b. Branchlets, petioles, and peduncles ± pubescent to subglabrous; stamens exerted; style shorter than stamens 30. *C. trichotomum*
- 19b. Cymes crowded.
- 26a. Inflorescences axillary.
- 27a. Leaf blade subglabrous; bracts deciduous in fruit 15. *C. peii*
- 27b. Leaf blade densely pubescent; bracts persistent in fruit 16. *C. bracteatum*
- 26b. Inflorescences terminal.
- 28a. Plants densely villous; calyx longer than fruit, without peltate glands 17. *C. canescens*

- 28b. Plants pilose or tomentose; calyx shorter than fruit, with peltate glands.
- 29a. Calyx and bracts pubescent with densely purplish red jointed glands 18. *C. tibetanum*
- 29b. Calyx and bracts pubescent but not as above.
- 30a. Calyx lobes linear-lanceolate or lanceolate.
- 31a. Corolla lobes elliptic to ovate, ca. 10 mm 19. *C. chinense*
- 31b. Corolla lobes obovate, 5–7 mm 20. *C. lindleyi*
- 30b. Calyx lobes narrowly triangular, triangular, triangular-lanceolate, or ovate-lanceolate.
- 32a. Corolla tube shorter than or equal to calyx; leaf blade adaxially strigose, abaxially densely yellowish brown pubescent especially on veins 21. *C. yunnanense*
- 32b. Corolla tube longer than calyx; leaf blade adaxially sparsely pubescent, abaxially sparsely glandular pubescent, subglabrous, or pubescent on veins.
- 33a. Bractlets lanceolate, ca. 1.8 cm; calyx 2–6 mm, lobes narrowly triangular to triangular, not longer than calyx tube 22. *C. bungei*
- 33b. Bractlets linear, 0.5–0.8 cm; calyx 10–15 mm, lobes triangular-lanceolate, longer than calyx tube 23. *C. confine*

1. *Clerodendrum indicum* (Linnaeus) Kuntze, Revis. Gen. Pl. 2: 506. 1891.

长管大青 chang guan da qing

Siphonanthus indica Linnaeus, Sp. Pl. 1: 109. 1753;
Clerodendrum siphonanthus R. Brown.

Subshrubs to shrubs 1–2 m tall. Branchlets purple to purplish, channeled, smooth. Leaves whorled with 3–5 per node or opposite, sessile or subsessile, with nodal hairs at petiole base; leaf blade narrowly lanceolate to oblong-lanceolate, 10–21 × 1.3–2.5 cm, membranous, glabrous, base attenuate, margin entire or sinuate, apex short acuminate; midvein prominent, veins 10–12 pairs. Inflorescences terminal leafy thyrses, 20–45 × 10–15 cm; cymes red, few flowered; peduncle to 3 cm; bracts linear-lanceolate to lanceolate, 1–2 cm; bractlets awl-shaped. Calyx 1–1.5 cm, divided 3/4 to base, densely minute round glandular; lobes ovate-lanceolate, 8–15 × 3–6 mm, apex acute. Corolla white, becoming cream colored; tube funnellform, curved, 5–9 cm; lobes spreading, lanceolate, elliptic, or ovate-oblong, 8–15 × 3–6 mm, apex obtuse. Stamens long exserted. Ovary glabrous. Style longer than stamens. Fruiting calyx crimson, to 3.8 cm in diam., leathery. Drupes dark blue, ca. 1.2 cm in diam., 2–4-lobed depending on number of pyrenes. Fl. and fr. Aug–Nov.

Roadsides on mountain slopes; 500–1000 m. Guangdong, Yunnan [Bhutan, Cambodia, India, Laos, Malaysia, Myanmar, Nepal, Thailand].

Medicinal, ornamental.

2. *Clerodendrum intermedium* Chamisso, Linnaea 7: 105 (typ. err. 150). 1832.

垦丁苦林盘 ken ding ku lin pan

Shrubs 1–2 m tall. Branches 4-angled. Leaf blade ovate, 8–20 cm, abaxially glandular dotted, base cordate, margin shallowly dentate, apex acuminate. Panicles terminal, bright red, to 25 cm. Flowers odorless. Corolla tube slender, ca. 1 cm; lobes oblong, subequal, spreading. Stamens red to purplish, ca. 2 cm, deflexed to recurved. Fruiting calyx enlarged, red, spreading to reflexed. Fruit blue, depressed globose, ca. 1 cm in diam.

300–500 m. S Taiwan [Indonesia, Philippines].

Specimens of this species have not been seen by the authors.

3. *Clerodendrum japonicum* (Thunberg) Sweet, Hort. Brit. 322. 1826.

??桐 cheng tong

Volkameria japonica Thunberg, Nova Acta Regiae Soc. Sci. Upsal. 3: 203. 1780; *Clerodendrum darrisii* H. Léveillé; *C. esquirolii* H. Léveillé; *C. japonicum* var. *album* Pei; *C. kaempferi* (Jacquin) Siebold; *C. kaempferi* var. *album* (Pei) Moldenke; *C. squamatum* Vahl; *Volkameria kaempferi* Jacquin.

Shrubs 1–4 m tall. Branchlets 4-angled, pubescent to subglabrous, nodes sometimes villous. Petiole 0.5–15(–27) cm, densely yellow-brown pubescent; leaf blade subcordate, 8–35 × 6–27 cm, sparsely pubescent, abaxially densely covered with numerous peltate glands often covered with a sand-colored secretion, base cordate, margin sparsely serrulate to dentate, apex acuminate to acute. Inflorescences terminal thyrses, 15–34 × 13–35 cm; bracts and bractlets usually reddish. Calyx red, 1–1.5 cm, deeply 5-lobed, pubescent, outside sandy glandular; lobes ovate-lanceolate to ovate, 0.7–1.3 cm. Corolla white or red, tube 1.5–2.2 cm; lobes oblong, 1–1.5 cm. Stamens and style 3 × or more longer than corolla tube. Fruiting calyx much longer than fruit, becoming reflexed. Drupes green when young, blue-black at maturity, subglobose, 7–10 mm in diam. Fl. and fr. May–Nov.

Thickets in valleys, along streams, in grassy openings; 100–1200 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangsu, S Jiangxi, Sichuan, Taiwan, Xizang, Yunnan, S Zhejiang [Bangladesh, Bhutan, India, Indonesia, Laos, Malaysia, Vietnam].

Medicinal, ornamental.

4. *Clerodendrum paniculatum* Linnaeus, Mant. Pl. 90. 1767.

圆齿大青 yuan chi da qing

Clerodendrum pyramidale Andrews; *Volkameria angu-lata* Loureiro.

Shrubs ca. 1 m tall. Branchlets 4-angled, subglabrous to pubescent, nodes villous. Leaves palmately lobed; petiole 3–11 cm, yellow-brown pubescent; leaf blade broadly ovate to subrounded, 5–17 × 7.5–19 cm, abaxially sparsely pubescent and sandy glandular, adaxially sparsely pubescent to subglabrous, base cordate, margin entire or minutely denticulate, apex acute. Inflorescences conical to rounded thyrses, 15–26 × 16–22 cm; peduncle long; bracts ovate-lanceolate to ovate; bractlets linear. Calyx ca. 7 mm, deeply 5-lobed, dotted; lobes usually lanceolate, ca. 5 mm. Corolla red to orange, tube 1–1.5 cm, dotted, outside pubescent, inside subglabrous; lobes oblong to ovate, spreading. Stamens and style 4 × as long as corolla tube. Drupes globose, 5–9 mm in diam. Fl. and fr. Apr–Feb.

Wet places; 100–500 m. Fujian, Guangdong, Taiwan [Bangladesh, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

5. *Clerodendrum wallichii* Merrill, J. Arnold Arbor. 33: 220. 1952.

垂茉莉 chui mo li

Clerodendrum nutans Wallich ex D. Don (1825), not Jack (1820).

Shrubs or small trees, 2–4 m tall, erect. Branchlets 4-angled, ± winged, glabrous. Petiole ca. 1 cm; leaf blade oblong to oblong-lanceolate, 11–18 × 2.5–4 cm, subleathery, glabrous, base narrowly cuneate, margin entire, apex acuminate to acute; veins 7 or 8 pairs, adaxially slightly distinct. Inflorescences pendent thyrses, 20–33 cm, glabrous, axis and peduncle 4-angled or winged; bracts small, linear to awl-shaped. Calyx red to purple, ca. 1 cm, tube very short; lobes ovate-lanceolate, 7–8 mm. Corolla white, tube ca. 1.1 cm; lobes ovate, 1.1–1.5 cm. Stamens and style exerted. Fruiting calyx red to purple, inflated, thickened. Drupes yellow-green when young, black and shiny at maturity, globose, 1–1.3 cm in diam. Fl. and fr. Oct–Apr.

Open forests on mountain slopes; 100–1200 m. SW Guangxi, Xizang, SW Yunnan [Bangladesh, India, Myanmar, Vietnam].

6. *Clerodendrum garrettianum* Craib, Bull. Misc. Inform. 1911: 444. 1911.

泰国垂茉莉 tai guo chui mo li

Shrubs 1–2 m tall, usually climbing; bark yellow-brown, gray-brown, or brown. Branchlets slender, pubescent when young, glabrescent. Petiole 0.5–7 cm, unequally paired, pubescent; leaf blade oblong to elliptic, 4–17 × 2–7 cm, pairs usually unequal, thinly papery to papery, pubescent, base broadly cuneate to truncate, margin entire and ciliate, apex acuminate to short caudate; veins 5–7 pairs, midvein and lateral veins distinct. Panicles of thyrsoid cymes, 3.5–11 cm; bracts lanceolate, 0.5–2 cm, apex acuminate. Calyx ca. 0.7 mm, deeply 5-lobed, outside pubescent; lobes narrowly lanceolate, ca. 5 mm. Corolla greenish to yellowish greenish, outside pubescent; tube slender, ca. 1.5 cm; lobes 6–8 mm. Stamens and style exerted. Fruiting calyx slightly inflated, reflexed. Drupes red, globose, ca. 6 mm. Fl. and fr. Aug–Nov.

Dense forests on mountain slopes; 500–1100 m. S and SW Yunnan [Laos, Thailand].

7. *Clerodendrum henryi* P'ei, Mem. Sci. Soc. China 1(3): 152. 1932.

南垂茉莉 nan chui mo li

Shrubs 1.5–3 m tall. Branchlets slightly 4-angled when young, becoming terete, glabrous. Petiole 2–7 cm, glabrous; leaf blade ± black when dry, lanceolate, elliptic-lanceolate, or elliptic, 7–21 × 2–7 cm, papery, subglabrous, base cuneate to broadly cuneate, margin entire, slightly undulate, or irregularly dentate, apex acuminate to caudate; veins 7 or 8 pairs, abaxially prominent. Inflorescences racemously arranged thyrses, slightly pendulous, 9–15 cm; peduncle slender, glabrous; bracts linear, lanceolate, or elliptic-lanceolate, 0.5–1.7 cm. Calyx purplish, 6–9 mm, glabrous; lobes ovate-oblong, 4–6 mm. Corolla white, yellowish, or rarely purplish, tube 1–1.9 cm, outside puberulent; lobes ovate, 6–8 mm. Stamens and styles exerted. Fruiting calyx purple,

enlarged. Drupes black, globose, 1–1.2 cm in diam. Fl. and fr. Sep–Jan.

• Forests on mountain slopes or along valleys; 700–1200 m. SW Yunnan.

8. *Clerodendrum hainanense* Handel-Mazzetti, Oesterr. Bot. Z. 80: 343. 1931.

海南??桐 hai nan cheng tong

Shrubs 1–4 m tall. Branchlets green, 4-angled, sub-glabrous to pubescent when young, becoming yellowish brown to gray, terete, and glabrous. Petiole 0.5–2.5 cm; leaf blade oblanceolate, narrowly elliptic, or obovate, 7–26 × 2–8 cm, membranous to papery, glabrous, abaxially densely small yellowish glandular, base narrowly cuneate to cuneate, margin entire, apex short caudate, veins 6–11 pairs. Inflorescences terminal, rarely axillary, lax thyrses, 8–14 cm, lateral cymes dichasial with peduncle to 3 cm; bracts linear to awl-shaped, 2–8 mm. Calyx pinkish to purple, ca. 5 mm; lobes triangular-lanceolate, ca. 4 mm. Corolla white, 0.5–4 cm, tube slender, outside puberulent and glandular; lobes obovate, 6–8 mm. Stamens long exerted. Ovary glabrous. Style longer than stamens. Fruiting calyx rotate, leathery. Drupes purple, globose, ca. 1 cm in diam. Fl. and fr. Sep–Dec.

• Forests on mountain slopes; 200–900 m. Guangxi, Hainan.

9. *Clerodendrum longilimum* P'ei, Mem. Sci. Soc. China 1(3): 151. 1932.

长叶大青 chang ye da qing

Shrubs 1–3 m tall. Branchlets 4-angled, glabrous. Petiole 2–6 cm; leaf blade elliptic, 2–20 × 4–8 cm, membranous, subglabrous or adaxially sparsely puberulent, base broadly cuneate to rounded, margin entire or slightly undulate, apex acuminate; veins 7 or 8 pairs, abaxially distinct. Panicles terminal, narrow; peduncle slender; bracts linear to lanceolate, deciduous in fruit. Calyx campanulate, 7–9 mm, deeply 5-lobed, glabrous or sparsely puberulent; lobes oblong to elliptic, 4–6 mm. Corolla yellowish or white, tube 1.5–1.8 cm, outside puberulent and glandular; lobes spatulate, ca. 8 mm. Stamens and style long exerted. Fruiting calyx red, inflated. Drupes globose. Fl. and fr. Aug–Dec.

Dense forests on mountain slopes; 400–2400 m. W Guangxi, S Yunnan [Vietnam].

Allied to *Clerodendrum wallichii* but differs in having elliptic membranous leaf blades and corolla tubes 1.5–1.8 cm.

10. *Clerodendrum fortunatum* Linnaeus, Sp. Pl. ed. 2, 889. 1763.

白花灯笼 bai hua deng long

Clerodendrum castaneifolium Hooker & Arnott; *C. lividum* Lindley; *C. oxysepalum* Miquel; *C. pentagonum* Hance; *C. pumilum* (Loureiro) Sprengel; *Volkameria pumila* Loureiro.

Shrubs ca. 2.5 m tall. Branches densely yellow-brown pubescent when young; branchlets dark brown. Petiole 0.5–3(–4) cm, densely yellow-brown pubescent; leaf blade elliptic, ovate-lanceolate, or rarely ovate-elliptic, 5–17.5 × 1.5–5 cm, papery, abaxially pubescent and densely small yellow glandular, adaxially pubescent, base cuneate to broadly cuneate, margin entire, undulate, or sparsely dentate-serrate, apex acuminate. Cymes axillary, shorter than subtending

leaves, 3–9(–18)-flowered; peduncle 1–4 cm, densely brown pubescent; bracts linear, densely brown pubescent. Calyx purple, deeply 5-lobed, outside pubescent, inside glabrous; lobes broadly ovate, forming 5 angles with their united edges. Corolla white or pinkish, salverform; tube straight, somewhat funnellform, slightly longer than calyx; limb oblique; lobes oblong, ca. 6 mm, reflexed. Stamens longer than corolla, declinate, inserted at ± middle of tube, base pubescent; anthers dark brown, sagittate, smooth. Style filiform, shorter than stamens. Fruiting calyx inflated. Drupes dark blue-green, subglobose, ca. 5 mm in diam., enclosed by calyx. Fl. and fr. Jun–Nov.

Mountain slopes along roadsides; 1000 m. Fujian, Guangdong, Guangxi, Jiangxi [Philippines, Vietnam].

Medicinal.

11. *Clerodendrum luteopunctatum* P'ei & S. L. Chen in P'ei, L. K. Fu, G. Y. Sheng, & T. D. Zhuang, Fl. Reipubl. Popularis Sin. 65(1): 212. 1982.

黄腺大青 huang xian da qing

Shrubs 2–4 m tall. Branchlets and stems with yellowish elliptic lenticels, densely rust colored pubescent. Petiole 1–5 cm, densely pubescent; leaf blade oblong-lanceolate, 7–15 × 2.5–5 cm, papery, pubescent especially on veins, densely yellow glandular, base broadly cuneate to rounded and rarely oblique, margin entire and ciliate, apex acuminate to caudate, veins 4–7 pairs, adaxially prominent. Inflorescences terminal corymbose cymes; bracts purple, lanceolate, 10–15 × 2–4 mm, apex acute, yellow glandular. Calyx red, campanulate, ca. 1.3 cm, submembranous, deeply 5-lobed, glandular; lobes lanceolate, ca. 9 mm. Corolla white, tube 2–2.5 cm; lobes oblong, ca. 5 mm. Stamens exserted. Ovary glabrous. Style shorter than or equal to stamens. Drupes subglobose, ca. 6 mm in diam., enclosed in calyx. Fl. and fr. Jun–Oct.

• Thicket on mountain slopes and along roadsides; 600–1200 m. Guizhou, Hubei, Sichuan.

12. *Clerodendrum ervatamioides* C. Y. Wu, Fl. Yunnan. 1: 460. 1977.

狗牙大青 gou ya da qing

Shrubs 0.8–3 m tall, erect to climbing. Branchlets grayish brown to brown, 4-angled when young, becoming subterete, sparsely lenticellate, densely minutely hirsute to subglabrous. Petiole 0.5–1.6 cm, densely minutely hirsute; leaf blade oblong to elliptic, 5.5–12.5 cm, subleathery, adaxially subglabrous, base broadly cuneate to subrounded, margin entire or slightly undulate, apex caudate; veins 5 or 6 pairs, abaxially prominent. Cymes terminal, capitate, erect, ca. 5.5 cm; peduncle ca. 7 mm; bracts linear, 4–7 mm, densely minutely hirsute. Pedicel densely minutely hirsute. Calyx red, campanulate, 1–1.3 cm, outside sparsely minutely hirsute and glandular, inside glabrous and sparsely scaly glandular; lobes reflexed. Corolla white, ca. 3.3 cm, tube slender, outside glandular; lobes ovate-lanceolate, ca. 6 mm. Stamens exserted. Style longer than stamens. Fruiting calyx enlarged, thickened. Drupes subglobose, ca. 1 cm in diam. Fl. and fr. Apr–May.

• Mixed forests on mountain slopes; 100–700 m. Yunnan.

Allied to *Clerodendrum garrettianum* but differs in having shorter capitate inflorescences and longer corolla tube with shorter lobes.

13. *Clerodendrum cyrtophyllum* Turczaninow, Bull. Soc. Imp. Naturalistes Moscou 36(3): 222. 1863.

大青 da qing

Shrubs or small trees, 1–10 m tall. Branchlets yellow-brown, pubescent. Petiole 1–8 cm; leaf blade oblong, oblong-lanceolate, elliptic, or ovate-elliptic, 6–20 × 3–9 cm, papery, glabrous or sparsely pubescent along veins, abaxially glandular, base rounded to cuneate, margin entire or rounded serrate, apex acuminate to acute, veins 6–10 pairs. Inflorescences corymbose, formed from terminal and subterminal cymes, 7–16 × 8–25 cm; bracts linear, 3–7 mm. Flowers small, fragrant. Calyx yellow-brown, cup-shaped, 3–4 mm, outside minutely tomentose and glandular, inside glabrous; lobes ca. 1 mm. Corolla white, ca. 1 cm, tube slender, sparsely puberulent, glandular; lobes ovate, ca. 5 mm. Stamens and style exserted. Ovary glabrous. Fruiting calyx red. Drupes blue-purple, obovate to globose, 5–10 mm in diam. Fl. and fr. Jun–Feb.

500–1700 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Korea, Malaysia, Vietnam].

1a. Leaf blade entire 13a. var. *cyrtophyllum*

1b. Leaf blade rounded serrate 13b. var. *kwangsiense*

13a. *Clerodendrum cyrtophyllum* var. *cyrtophyllum*

大青 da qing

Clerodendrum amplius Hance; *C. formosanum* Maximowicz; *Cordia venosa* Hemsley.

Leaf blade oblong, oblong-lanceolate, ovate-elliptic, or elliptic, margin entire, apex acuminate to acute. Inflorescences 10–16 × 20–25 cm. Fl. and fr. Jun–Feb.

Forests on mountain slopes or along streams; below 1700 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hubei, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Korea, Malaysia, Vietnam].

13b. *Clerodendrum cyrtophyllum* var. *kwangsiense* S. L. Chen & T. D. Zhuang in P'ei, L. K. Fu, G. Y. Sheng, & T. D. Zhuang, Fl. Reipubl. Popularis Sin. 65(1): 212. 1982.

广西大青 guang xi da qing

Leaf blade oblong, margin rounded serrate, apex obtuse. Inflorescences 7–12 × 8–15 cm.

• Thickets on mountain slopes; 500–1000 m. Guangxi.

14. *Clerodendrum kwangtungense* Handel-Mazzetti, Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 59: 111. 1922.

广东大青 guang dong da qing

Shrubs 2–3 m tall. Branchlets yellowish brown, pubescent. Petiole 1–4(–7) cm, slightly pubescent; leaf blade oblong to ovate, 6–18 × 2–7 cm, membranous, both surfaces glabrous except for pubescent veins, base broadly cuneate to subrounded, margin entire, irregularly serrate, or slightly undulate, apex acuminate to caudate, veins 4–6 pairs. Inflorescences erect, lax corymbose cymes, 7–12 × 8–15 cm, densely pubescent; bracts lanceolate to ovate-lanceolate, 0.8–1.2 cm; bractlets linear to lanceolate. Calyx 6–7 mm, tube as long as lobes, deeply 5-lobed, lobes lanceolate to triangular, outside sparsely puberulent. Corolla white, 2–3 cm, tube slender; lobes oblong, 4–5 mm. Stamens and style exserted.

Fruiting calyx red, inflated. Drupes globose, 5–6 cm in diam. Fl. and fr. Aug–Nov.

• Forests, forest edges; 600–1300 m. N Guangdong, NE Guangxi, NE Guizhou, Hunan, Yunnan.

Medicinal.

15. *Clerodendrum peii* Moldenke, Geogr. Distr. Avicenn. 79. 1942.

长梗大青 chang geng da qing

Shrubs 1–3(–7) m tall. Branchlets 4-angled, densely yellowish brown pubescent when young, glabrescent. Petiole 6–11.5 cm, yellowish brown pubescent when young, glabrescent; leaf blade broadly ovate to cordate, 6–17.5 × 6.2–12.5 cm, when young both surfaces puberulent especially on veins and small glandular, glabrescent, with several large glands near base, base broadly cuneate, truncate, or cordate, margin entire or sparsely undulate, apex acuminate. Cymes axillary, capitate; bracts lanceolate to ovate-lanceolate, ca. 1.9 cm, puberulent, sparsely glandular, deciduous in fruit. Calyx cup-shaped, ca. 8 mm, outside pubescent and large glandular; lobes triangular, ca. 2 mm. Corolla white or pink, ca. 1.4 cm, tube funnelliform. Stamens and style exerted. Fruiting calyx red, ca. 6 mm, reflexed. Drupes green when young, blue-black at maturity, subglobose, 5–7 mm in diam. Fl. and fr. Jun–Oct.

• Forests along streams and roadsides; 1400–2400 m. S Yunnan.

16. *Clerodendrum bracteatum* Wallich ex Walpers, Repert. Bot. Syst. 4: 106. 1845.

苞花大青 bao hua da qing

Shrubs or small trees, 3–4(–10) m tall. Branchlets 4-angled, densely yellowish brown tomentose. Petiole 2.5–4.5 cm, densely pubescent; leaf blade ovate to broadly ovate, 11–16 × 6–10 cm, abaxially densely villous, adaxially strigose-minutely hirsute, both surfaces yellow to orange glandular dotted, base broadly cuneate to subtruncate, margin entire or subentire, apex acuminate. Inflorescences axillary, cymelike capitula; peduncle 3.5–13 cm; bracts persistent, elliptic to ovate, 1–3 cm, apex acuminate to caudate, pubescent, glandular. Calyx red, ca. 1.6 cm, membranous, deeply 5-lobed, outside puberulent, with several small and large glands, inside glabrous; lobes ovate-lanceolate, ca. 1.1 cm, acuminate. Corolla white, 1.8–3.5 cm; tube slender, outside puberulent and glandular, inside glabrous; lobes oblong, 6–8 mm. Stamens equal or slightly longer than style. Drupes enclosed in calyx, green when young, purple-black at maturity, subglobose, ca. 6 mm in diam. Fl. and fr. Jul–Nov.

Bamboo or mixed forests on mountain slopes; 900–1900 m. NW Xizang, Yunnan [Bangladesh, Bhutan, India].

Allied to *Clerodendrum peii* but differs in having densely yellow-brown tomentose branchlets, petioles, and peduncles, persistent bracts, and stamens and styles as long as corolla.

17. *Clerodendrum canescens* Wallich ex Walpers, Repert. Bot. Syst. 4: 105. 1845.

灰毛大青 hui mao da qing

Clerodendrum haematocalyx Hance.

Shrubs 1–3.5 m tall; petioles and peduncles densely yellowish to brownish tomentose to nearly villous. Branchlets 4-angled. Petiole 1.5–12 cm; leaf blade broadly ovate or

cordate, rarely ovate, 6–18 × 4–15 cm, villous especially on veins, base cordate to subtruncate, margin entire or sparsely mucronate-dentate, apex acuminate. Inflorescences terminal, subconical; peduncle robust, 1.5–11 cm; bracts leaflike, elliptic to ovate, 0.5–2.4 cm. Calyx green when young, ca. 1.3 cm, membranous, deeply 5-lobed, lobes ovate to broadly ovate. Corolla white or pinkish, outside puberulent; tube slender, ca. 2 cm; lobes obovate-oblong, 5–6 mm, reflexed. Stamens and style exerted. Fruiting calyx red. Drupes green when young, dark blue to black at maturity, subglobose, ca. 7 mm in diam. Fl. and fr. Apr–Oct.

Open forests on mountain slopes; 200–800 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [India, Vietnam].

18. *Clerodendrum tibetanum* C. Y. Wu & S. K. Wu, Acta Phytotax. Sin. 16(4): 122. 1978.

西藏大青 xi zang da qing

Herbs 2–3 m tall. Branchlets gray-green, sparsely pubescent. Petiole 4–5 cm, densely rust colored pubescent; leaf blade elliptic, ca. 27 × 18 cm, 6–8 × 4–4.5 cm just below inflorescences, papery, abaxially densely pilose along veins, adaxially many-celled pilose, base broadly cuneate to subrounded, margin mucroserrulate and ciliate; veins 6–8 pairs, abaxially prominent. Inflorescences terminal, corymbose cymes, densely purplish red jointed glandular pubescent; bracts lanceolate, ca. 1.5 × 3 cm. Calyx ca. 1.3 cm, deeply 5-lobed; lobes linear-lanceolate, ca. 1 cm. Corolla purple, tube 1–2 cm; lobes elliptic, much shorter than tube, acute. Filaments compressed, glabrous. Ovary glabrous. Style shorter than stamens. Fl. and fr. Aug.

• Mixed forests on mountain slopes; 900 m. Xizang.

19. *Clerodendrum chinense* (Osbeck) Mabblerley, Pl.-Book, repr. ed. 707. 1989.

重瓣臭茉莉 chong ban xiu mo li

Shrubs 0.5–1.2 m tall. Branchlets nearly 4-angled to terete, pubescent when young, glabrescent. Petiole 3–17 cm, pubescent to tomentose; leaf blade broadly ovate to sub-cordate, 9–22 × 8–21 cm, abaxially pubescent especially on veins and with several large glands near base, adaxially strigose, base truncate, broadly truncate, or subcordate, margin sparsely irregularly dentate, apex acuminate. Inflorescences terminal, dense corymbose cymes; peduncle tomentose; bracts lanceolate, 1.5–3 cm; pubescent, with several large glands. Flowers single or double, fragrant. Calyx 1.5–2.5 cm, deeply 5-lobed, pubescent, with several large glands; lobes linear-lanceolate or lanceolate, 0.7–1.6 cm. Corolla white, pinkish, or red, lobes elliptic or ovate.

• Wild in Guangxi, Guizhou, and Yunnan [cultivated in tropical and subtropical Asia].

- 1a. Flowers double; corolla lobes ovate 19a. var. *chinense*
- 1b. Flowers single; corolla lobes elliptic 19b. var. *simplex*

19a. *Clerodendrum chinense* var. *chinense*

重瓣臭茉莉 chong ban xiu mo li

Cryptanthus chinense Osbeck, Dagb. Ostind. Resa 215. 1757; *Clerodendrum fragrans* (Ventenat) Willdenow var.

multiplex Sweet; *C. fragrans* var. *pleniflorum* Schauer; *C. philippinum* Schauer; *Volkameria fragrans* Ventenat.

Flowers double. Calyx 1.5–1.7 cm; lobes linear-lanceolate, 7–10 mm. Corolla red, pinkish, or white, lobes ovate.

• Cultivated in Fujian, Guangdong, Guangxi, Taiwan, and Yunnan [widely cultivated ornamental in tropical and subtropical Asia].

19b. *Clerodendrum chinense* var. *simplex* (Moldenke) S. L. Chen, *Novon* 1: 58. 1991.

臭茉莉 xiu mo li

Clerodendrum philippinum var. *simplex* Moldenke, *Phytologia* 20: 338. 1970.

Plants densely pubescent. Flowers simple. Calyx 1.5–2.5 cm; lobes lanceolate, 1–1.6 cm. Corolla white or pinkish, tube 2–3 cm; lobes elliptic, ca. 1 cm. Drupes enclosed by persistent inflated calyx, blue-black, 8–10 mm in diam.

• Forests along streams; 700–1500 m. Guangxi, Guizhou, Yunnan.

Medicinal.

20. *Clerodendrum lindleyi* Decaisne ex Planchon, *Fl. Serres Jard. Eur.* 9: 17. 1853.

尖齿臭茉莉 jian chi xiu mo li

Shrubs 0.5–3 m tall. Branchlets pubescent, nearly 4-angled when young, becoming subterete. Petiole 2–11 cm, pubescent; leaf blade broadly ovate to cordate, 6.5–12.5(–22) × 5.5–10(–20) cm, papery, pubescent especially abaxially, with several peltate glands at base, base truncate to cordate, margin irregularly undulate, apex acuminate. Inflorescences terminal, dense, capitate corymbose cymes; peduncle pubescent; bracts lanceolate, 2.5–4 cm, puberulent, with several peltate glands. Calyx 1–1.5 cm, deeply 5-lobed, densely puberulent, with several peltate glands; lobes linear-lanceolate, 4–10 mm. Corolla pinkish to purple, tube 2–3 cm; lobes obovate, 5–7 mm. Stamens exerted. Style exceeding stamens. Drupes enclosed in purple, inflated, persistent calyx, blue-black, subglobose, 5–6 mm in diam. Fl. and fr. Jun–Nov.

• Mixed forests on mountain slopes and along roadsides; 1200–2800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang.

Medicinal.

21. *Clerodendrum yunnanense* Hu ex Handel-Mazzetti, *Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz.* 61: 168. 1924.

滇常山 dian chang shan

Shrubs 1–3 m tall. Branchlets distinctly lenticellate, densely yellow-brown tomentose when young, glabrescent. Petiole 1.5–6 cm; leaf blade ovate, broadly ovate, or cordate, 4–14 × 3–10 cm, papery, abaxially densely yellowish or yellow-brown pubescent especially on veins and with several peltate glands near base, adaxially strigose, base broadly cuneate, rounded, or cordate, margin entire or irregularly sparsely serrate, apex acuminate to acute. Inflorescences terminal, dense flat-topped cymes; bracts ovate-elliptic, 2–3.5 cm, deciduous; bractlets linear, 1–2.2 cm. Calyx campanulate, 6–9 mm, minutely tomentose, with several large glands; lobes linear lanceolate or triangular, ca. 2 mm. Corolla white or pinkish, 4–7 mm, lobes oblong to ovate. Stamens exerted.

Style exceeding stamens. Drupes mostly enclosed by persistent inflated calyx, blue-black, subglobose, ca. 7 mm in diam. Fl. and fr. Apr–Oct.

• 2000–3000 m. SW Sichuan, Yunnan.

1a. Calyx lobes triangular 21a. var. *yunnanense*

1b. Calyx lobes linear-lanceolate 21b. var. *linearilobum*

21a. *Clerodendrum yunnanense* var. *yunnanense*

滇常山 dian chang shan

Calyx lobes triangular. Corolla tube ± shorter than calyx.

• Thickets on mountain slopes and in valleys; 2000–3000 m. SW Sichuan, Yunnan.

21b. *Clerodendrum yunnanense* var. *linearilobum* S. L. Chen & G. Y. Sheng in P'ei, L. K. Fu, G. Y. Sheng & T. D. Zhuang, *Fl. Reipubl. Popularis Sin.* 65(1): 213. 1982.

线齿滇常山 xian chi dian chang shan

Calyx lobes linear-lanceolate. Corolla tube slightly longer to rarely shorter than calyx.

• Thickets along streams; 2000–2300 m. Yunnan.

22. *Clerodendrum bungei* Steudel, *Nomencl. Bot., ed. 2*, 1: 382. 1840.

臭牡丹 xiu mu dan

Shrubs 1–2 m tall. Branchlets subterete, distinctly lenticellate. Petiole 4–17 cm, densely brown, yellow-brown, or purplish pubescent when young, glabrescent; leaf blade ovate to broadly ovate, 8–20 × 5–15 cm, papery, abaxially sparsely glandular pubescent to subglabrous and with several peltate glands near base, adaxially sparsely pubescent, base cuneate, truncate, or cordate, margin serrate, apex acuminate to acute, veins 4–6 pairs. Inflorescences terminal, dense, capitate, flat-topped cymes; bracts lanceolate to ovate-lanceolate, ca. 3 cm, deciduous; bractlets lanceolate, ca. 1.8 cm. Calyx campanulate, tube 2–6 mm, pubescent, with several peltate glands; lobes narrowly triangular to triangular, 1–10 mm. Corolla pinkish, red, or purple, tube 2–3 cm; lobes obovate, 5–8 mm. Stamens and style exerted. Drupes blue-black, subglobose, 6–12 mm in diam. Fl. and fr. May–Nov.

1100–2500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Vietnam].

Medicinal.

1a. Inflorescences dense; calyx teeth 1–3 mm

..... 22a. var. *bungei*

1b. Inflorescences lax; calyx teeth ca. 10 mm

..... 22b. var. *megacalyx*

22a. *Clerodendrum bungei* var. *bungei*

臭牡丹 xiu mu dan

Clerodendrum fragrans (Ventenat) Willdenow var. *foetidum* (Bunge) Bakhuizen; *C. yatschuense* H. Winkler; *Pavetta esquirolii* H. Léveillé.

Inflorescences dense. Calyx teeth 1–3 mm.

Mixed forests on mountain slopes and along roadsides; below 2500 m. Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Ningxia, Qinghai, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Vietnam].

Medicinal.

22b. *Clerodendrum bungei* var. *megacalyx* C. Y. Wu ex S. L. Chen in P'ei, L. K. Fu, G. Y. Sheng, & T. D. Zhuang, Fl. Reipubl. Popularis Sin. 65(1): 213. 1982.

大萼臭牡丹 *da e xiu mu dan*

Inflorescences lax. Calyx teeth ca. 10 mm.

- Forest edges on mountain slopes; 1100 m. Sichuan.

23. *Clerodendrum confine* S. L. Chen & T. D. Zhuang in P'ei, L. K. Fu, G. Y. Sheng, & T. D. Zhuang, Fl. Reipubl. Popularis Sin. 65(1): 213. 1982.

川黔大青 *chuan qian da qing*

Shrubs 1–2 m tall. Branchlets yellow-brown to purplish, subterete to nearly 4-angled, with elliptic lenticels, pubescent. Petioles 3–5.5 cm, densely pubescent; leaf blade elliptic to ovate-elliptic, 6–15 × 3.5–7 cm, papery, abaxially pubescent on veins and glandular, adaxially sparsely pubescent, base broadly cuneate to rounded or rarely truncate, margin entire or rarely several dentate, apex acuminate, veins 6 or 7 pairs. Inflorescences terminal, lax corymbose cymes; peduncle 2–3.5 cm, densely pubescent; bracts deciduous; bractlets linear, 5–8 mm. Calyx 1–1.5 cm, submembranous, deeply 5-lobed, puberulent, with several peltate glands; lobes triangular-lanceolate, as long as tube. Corolla pinkish, tube 1–2 mm; lobes spatulate, ca. 1 cm. Stamens and style exerted.

- Thickets; 1400–2000 m. Guizhou, Sichuan.

24. *Clerodendrum colebrookianum* Walpers, Repert. Bot. Syst. 4: 114. 1845.

腺茉莉 *xian mo li*

Shrubs or small trees, 1.5–3(–6) m tall. Branchlets robust, 4-angled, densely yellow-brown puberulent when young, glabrescent. Petiole 2–20 cm; leaf blade broadly ovate to elliptic-cordate, 7–17 × 6–21 cm, papery, abaxially puberulent and with several peltate glands near base, adaxially sparsely pubescent to subglabrous, base cuneate to cordate, margin entire to slightly undulate, apex acuminate to acute. Inflorescences terminal corymbose cymes, 4–6-branched; peduncle robust, 1.5–13 cm; bracts lanceolate, ca. 1.5 cm, deciduous. Calyx campanulate, 3–5 mm, tube 1–3 mm, densely pubescent, with several peltate glands; teeth triangular, less than 1 mm. Corolla white or rarely pinkish, tube 1.2–2.5 cm, without glands; lobes oblong, 3–6 mm. Stamens and style exerted. Fruiting calyx purple, inflated. Drupes blue-green, becoming black when dry, subglobose, ca. 1 cm in diam. Fl. and fr. Aug-Dec.

Forests or thickets on mountain slopes and along roads; 500–2000 m. Guangdong, Guangxi, Xizang, Yunnan [Bangladesh, Bhutan, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Thailand, Vietnam].

25. *Clerodendrum kaichianum* Hsu, Observ. Fl. Hwang-shan. 165. 1965.

浙江大青 *zhe jiang da qing*

Shrubs or small trees, 2–5 m tall. Branchlets nearly 4-angled, densely yellow-brown, brown, or reddish brown pubescent when young. Petiole 3–6 cm; leaf blade elliptic-ovate to ovate, 8–18 × 5–11 cm, papery, abaxially strigose only on veins and with several peltate glands near base, adaxially sparsely strigose, base broadly cuneate to subtruncate

and slightly oblique, margin entire, apex acuminate, veins 5 or 6 pairs. Inflorescences terminal, corymbose cymes, 4- or 5-branched near base; bracts deciduous. Calyx pinkish, ca. 3 mm, outside puberulent and glandular; teeth triangular, ca. 1 mm. Corolla cream white to pinkish, tube 1–1.5 cm, outside glandular; lobes oblong, ca. 6 × 3 mm. Stamens exerted; filaments longer than style. Fruiting calyx purplish, inflated. Drupes blue-green, obovate to globose, ca. 1 cm in diam. Fl. and fr. Jul-Oct.

- Valleys; 500–1300 m. Anhui, Fujian, Jiangxi, Zhejiang.

26. *Clerodendrum villosum* Blume, Bijdr. 811. 1826.

绢毛大青 *juan mao da qing*

Shrubs 2.5–4 m tall, sometimes climbing. Branchlets 4-angled, densely yellow-brown sericeous. Petiole terete, 3–14 cm, densely sericeous; leaf blade broadly ovate-cordate to cordate, 11–21 × 7–16 cm, villous especially on veins, base truncate to cordate, margin entire, apex acuminate, veins prominent on both surfaces. Inflorescences terminal cymose panicles, 15–25 × 14–20 cm, densely sericeous; bracts ovate, 4.5–6.5 cm, persistent; bractlets ovate, 6–10 mm, deciduous, with several peltate glands. Calyx campanulate, ca. 7 mm, outside densely sericeous and with peltate glands, inside pubescent; lobes subsecund, obovate-oblong, as long as tube. Corolla white or pinkish yellow, tube equal or slightly longer than calyx, limb subsecund, outside densely sericeous, inside glabrous; lobes obovate-oblong, ca. 7 mm. Stamens exerted, as long as style. Drupes green-black, globose, 8–10 mm in diam. Fl. and fr. Mar-Apr.

Forests or thickets in valleys and along roadsides; 700–900 m. Yunnan [Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

27. *Clerodendrum kiangsiense* Merrill ex H. L. Li, J. Arnold Arbor. 25: 426. 1944.

江西大青 *jiang xi da qing*

Shrubs 2–3 m tall. Branchlets densely brown pubescent. Petiole 2–4.5 cm, pubescent; leaf blade lanceolate to ovate, (5–)10–13 × (3–)5–6(–9) cm, papery, both surfaces pubescent, abaxial glands small and inconspicuous, base subrounded to subtruncate, margin entire or subentire, apex acuminate to short caudate, veins 4–7 pairs. Inflorescences terminal, corymbose thyrses, 3–10 × 7–19 cm; bracts oblong, 8–10 × 3–4 mm, pubescent glandular. Calyx campanulate, ca. 6 mm, teeth triangular, outside pubescent glandular. Corolla white or pinkish, puberulent; tube slender, 7–10 × 1 mm; lobes oblong, ca. 6 mm. Stamens exerted. Style longer than stamens. Drupes green, subglobose. Fl. and fr. Jun-Oct.

- Forests; 100–400 m. Jiangxi, Zhejiang.

28. *Clerodendrum mandarinorum* Diels in Engler, Bot. Jahrb. Syst. 29: 549. 1900.

海通 *hai tong*

Clerodendrum bodinieri H. Léveillé; *C. cavaleriei* H. Léveillé; *C. kwangtungense* Handel-Mazzetti var. *puberulum* H. L. Li; *C. tsaii* H. L. Li.

Shrubs or trees 2–20 m tall. Branchlets nearly 4-angled, densely yellow-brown tomentose. Leaf blade ovate-elliptic, broadly ovate, or cordate, 10–27 × 6–20 cm, subleathery, abaxially densely gray tomentose, adaxially green, base truncate to subcordate and suboblique, apex acuminate. Inflorescences terminal, lax, corymbose, many branched,

densely yellow-brown tomentose; bracts 4–5 mm, deciduous; bractlets linear, ca. 3 mm. Flowers fragrant. Calyx campanulate, 3–4 mm, densely pubescent, with several peltate glands; teeth awl-shaped, 1.5–2.5 mm. Corolla white or pinkish, 7–10 mm, tube slender; lobes oblong, ca. 3.5 mm. Stamens and style exerted. Fruiting calyx red to pink, inflated, thickened, enclosing 2/3 of drupe. Drupes blue-black, subglobose, reflexed. Fl. and fr. Jul-Dec.

Thickets along streams and roadsides; 300–2200 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan [Vietnam].

Medicinal.

Allied to *Clerodendrum kaichianum* but differs in having much branched inflorescences and calyx teeth narrowly triangular and longer than tube.

29. *Clerodendrum brachystemon* C. Y. Wu & R. C. Fang, Fl. Yunnan. 1: 475. 1977.

短蕊大青 duan rui da qing

Shrubs 4 m tall, densely yellow-brown tomentose on branches, petioles, leaves abaxially, peduncles, and pedicels. Branchlets 4-angled, glandular. Petiole 3.5–8 cm, glandular; leaf blade 10–20 × 5–10 cm, glandular, adaxially densely pubescent, base rounded to truncate, margin entire, apex acuminate. Inflorescences dichotomous, lax; peduncle 2–7 cm; bracts deciduous; bractlets elliptic-lanceolate, ca. 1 cm. Calyx campanulate, ca. 1.5 cm, yellow-brown pubescent, glandular, with several peltate glands; lobes lanceolate to ovate, ca. 9 mm, acuminate. Corolla white, 3–3.5 cm, tube slender, pilose, outside glandular; lobes ovate, 7–10 mm. Stamens equal or slightly longer than corolla tube. Style slightly longer than stamens. Drupes enclosed in inflated persistent calyx, globose, ca. 4 mm. Fl. and fr. Aug-Oct.

• Open forests along valleys; 800–1400 m. Xizang (Médog), Yunnan (Xishuangbanna Zizhizhou).

Allied to *Clerodendrum trichotomum* but differs in stamens and styles not as exerted and petioles densely yellow-brown tomentose.

30. *Clerodendrum trichotomum* Thunberg, Nova Acta Regiae Soc. Sci. Upsal. 3: 201. 1780.

海州常山 hai zhou chang shan

Shrubs or small trees, 1.5–10 m tall. Branchlets lenticellate. Petiole 2–8 cm; leaf blade greenish abaxially and dark green adaxially, ovate-elliptic, triangular-ovate, or ovate, 5–16 × 2–13 cm, papery, base broadly cuneate, truncate, or rarely cordate, margin entire or rarely undulate, apex acuminate, veins 3–5 pairs. Inflorescences axillary or terminal, lax, corymbose cymes, dichotomous, 8–18 cm; peduncle 3–6 cm; bracts elliptic, deciduous. Flowers fragrant. Calyx greenish, becoming purple, deeply 5-lobed; lobes triangular-lanceolate to ovate, acute. Corolla white or pinkish, ca. 2 cm, tube slender; lobes oblong, 5–10 × 3–5 mm. Style shorter than stamens, both exerted. Drupes blue-purple, subglobose, ca. 6–8 mm in diam.

Below 2400 m. Throughout China except Nei Mongol, Xinjiang, and Xizang [India, Japan, Korea; SE Asia].

- 1a. Branchlets, leaves, and inflorescences slightly puberulent or glabrous 30a. var. *trichotomum*
1b. Branchlets, leaves, and inflorescences densely rust colored tomentose 30b. var. *ferrugineum*

30a. *Clerodendrum trichotomum* var. *trichotomum*

海州常山 hai zhou chang shan

Clerodendrum fargesii Dode; *C. koshunense* Hayata; *C. serotinum* Carrière; *C. trichotomum* var. *fargesii* (Dode) Rehder; *C. trichotomum* var. *villosum* Hsu; *Siphonanthus trichotomum* (Thunberg) Nakai; *S. trichotomum* var. *fargesii* (Dode) Nakai.

Branchlets, petioles, and peduncles ± yellow-brown pubescent to subglabrous. Leaf blade 5–16 × 2–13 cm, gray pubescent when young, glabrescent.

Thickets on mountain slopes; below 2400 m. Throughout China except Nei Mongol, Xinjiang, and Xizang [India, Japan, Korea; SE Asia].

30b. *Clerodendrum trichotomum* var. *ferrugineum* Nakai, Bot. Mag. (Tokyo) 31: 109. 1917.

锈毛海州常山 xiu mao hai zhou chang shan

Branchlets and inflorescences rust colored tomentose. Leaf blade 5–10 × 3–6 cm, densely rust colored tomentose.

- Below 2400 m. S Taiwan.

Specimens of this variety have not been seen by the authors. The variety is possibly close to *Clerodendrum brachystemon*.

31. *Clerodendrum griffithianum* C. B. Clarke in J. D. Hooker, Fl. Brit. Ind. 4: 590. 1885.

西垂茉莉 xi chui mo li

Shrubs 1–4 m tall; branchlets, petioles, peduncles, pedicels, and calyces viscid pubescent. Petiole 1.5–4 cm; leaf blade elliptic-lanceolate to elliptic, 5–12 × 2.5–6 cm, papery, pubescent or adaxially subglabrous, base cuneate to subrounded, margin usually entire, apex acuminate to caudate. Inflorescences terminal, few to many 3-flowered cymes; bracts linear, 1–1.5 cm. Calyx purple, ca. 1.5 cm, tube short. Corolla white, ca. 4 cm, outside densely yellow glandular; tube slender, ca. 3 cm; lobes spatulate, ca. 1 cm. Fruiting calyx enlarged; teeth triangular-lanceolate, overtopping drupe. Drupes black, globose, ca. 1 cm in diam. Fl. and fr. Nov-Jun.

Forests; 800–1700 m. S Yunnan [India, Myanmar].

32. *Clerodendrum inerme* (Linnaeus) Gaertner, Fruct. Sem. Pl. 1: 271. 1788.

苦郎树 ku lang shu

Volkameria inermis Linnaeus, Sp. Pl. 2: 637. 1753; *Clerodendrum nerifolium* (Roxburgh) Schauer; *V. nerifolia* Roxburgh.

Shrubs. Branches and branchlets pubescent. Petiole ca. 1 cm to leaf subsessile; leaf blade elliptic-lanceolate, ovate-lanceolate, or elliptic, thick papery, abaxially pubescent, adaxially subglabrous and glandular, base obtuse, margin entire, apex obtuse. Inflorescences usually 3-flowered, pubescent; peduncle 2–4 mm; bracts linear, ca. 2 cm. Calyx subtruncate, with minute rudimentary teeth, outside pubescent, inside glabrous, sparsely glandular. Corolla white; tube 2–3 cm, ca. 2 mm in diam. at throat; lobes elliptic, ca. 7 mm. Stamens exerted, pubescent at base of filaments. Style and ovary glabrous. Drupes gray-yellow, obovoid to subglobose, 6–11 mm in diam. Fl. and fr. Mar-Dec.

Sea coast; 100–200 m. Fujian, Guangdong, Guangxi, Taiwan [S and SE Asia, Australia, Pacific Islands].

Medicinal.

33. *Clerodendrum subscaposum* Hemsley, Hooker's Icon. Pl. 27: t. 2675. 1900.

抽葶大青 chou ting da qing

Subshrubs 30–50 cm tall. Branchlets greenish when young, becoming gray-brown, shiny, and glabrous. Petiole subglabrous, 7–18 cm but leaf subsessile below inflorescence; leaf blade ovate, 5.5–15 × 4.5–13 cm, membranous, abaxially gray and subglabrous to sparsely small glandular especially along veins, adaxially pubescent and gray glandular, base cordate, margin irregularly serrate, apex acuminate to acute. Thyrses of 3–5-flowered cymes, 30–40 cm; peduncle purple, sparsely small glandular; bracts linear to narrowly lanceolate, 3–7 mm; bractlets linear, ca. 2 mm. Pedicel slender, 1.5–2.5 cm. Calyx campanulate, ca. 2 × 2–4 mm, truncate to minutely 5-dentate, glabrous. Corolla bluish purple, deeply 5-lobed, sparsely glandular; tube slender, ca. 5 mm; lobes elliptic to obovate, ca. 5 mm. Stamens and style long exerted. Fruiting calyx not enlarged. Drupes ca. 3 mm in diam., apically glandular.

Mountain slopes; 1400–2100 m. S Yunnan [India, Vietnam].

34. *Clerodendrum serratum* (Linnaeus) Moon, Cat. Pl. Ceylon 46. 1824.

三对节 san dui jie

Shrubs 1–4 m tall. Branchlets densely yellow pubescent especially on nodes when young, becoming dark brown to gray-yellow and glabrous. Leaves opposite or in threes; petiole to 5 cm or leaf subsessile; leaf blade oblong, obovate-oblong, elliptic, or ovate, 6–30 × 2.5–11 cm, papery, pubescent, margin subentire to serrulate or sparsely coarse serrate, apex acuminate to acute; veins 10 or 11 pairs, abaxially prominent. Inflorescences terminal thyrses, densely yellow-brown pubescent, cymes sometimes monochasial; bracts sessile, ovate to broadly ovate, 1.5–4.5 × 0.5–1.8 cm, pubescent; bractlets lanceolate to ovate. Calyx ca. 5 mm, truncate to minutely 5-dentate, pubescent. Corolla white, bluish, or purplish, tube ca. 7 mm; lobes oblong to obovate, 6–12 mm. Stamens ca. 2–4 cm, long exerted, base pubescent. Ovary glabrous. Style long exerted. Drupes green when young, becoming black, subglobose. Fl. and fr. Jun-Dec.

200–1800 m. Guangxi, Guizhou, Xizang, Yunnan [E Africa, S and SE Asia].

Medicinal.

- 1a. Leaves petiolate with petioles 2–5 cm; filament bases compressed 34d. var. *wallichii*
1b. Leaves sessile or subsessile; filament bases cylindrical.

2a. Base of leaf blade clasping ... 34c. var. *amplexifolium*

2b. Base of leaf blade not clasping.

3a. Inflorescences conical; leaves opposite or in 3s 34a. var. *serratum*

3b. Inflorescences cylindrical; leaves opposite 34b. var. *herbaceum*

34a. *Clerodendrum serratum* var. *serratum*

三对节 san dui jie

Volkameria serrata Linnaeus, Mant. Pl. 90. 1767.

Leaves opposite or in 3s; blade oblong to obovate-oblong, 6–30 × 2.5–11 cm, base decurrent to cuneate, margin serrulate. Inflorescences conical, 10–30 × 9–12 cm.

Forests on mountain slopes and in valleys; 200–1800 m. Guangxi, Guizhou, Xizang, Yunnan [E Africa, S and SE Asia].

34b. *Clerodendrum serratum* var. *herbaceum* (Roxburgh ex Schauer) C. Y. Wu, Fl. Yunnan. 1: 468. 1977.

草本三对节 cao ben san dui jie

Clerodendrum herbaceum Roxburgh ex Schauer in A. de Candolle, Prodr. 11: 675. 1847.

Leaf blade oblanceolate-ovate, (9–)12–16(–18) × (2.5–)4.5–6(–8) cm, margin sparsely coarse serrate. Inflorescences cylindrical.

Mixed forests on mountain slopes; 400–1500 m. Guangxi, Guizhou, Yunnan [E Africa, S and SE Asia].

34c. *Clerodendrum serratum* var. *amplexifolium* Mold-enke, Phytologia 4: 51. 1952.

三台花 san tai hua

Leaves subsessile, base clasping.

- Thickets; 600–1600 m. Guangxi, Guizhou, Yunnan.

34d. *Clerodendrum serratum* var. *wallichii* C. B. Clarke in J. D. Hooker, Fl. Brit. Ind. 4: 592. 1885.

大序三对节 da xu san dui jie

Clerodendrum divaricatum Jack.

Petiole 2–5 cm; leaf blade elliptic to ovate, 10–14(–25) × 6–8(–13) cm, base broadly cuneate to subrounded, margin subentire to serrulate. Inflorescences conical thyrses, spreading. Calyx ± truncate.

Open forests on mountain slopes; 700–1800 m. Xizang, Yunnan [Cambodia, India, Indonesia, Malaysia, Vietnam].

15. **CARYOPTERIS** Bunge, Pl. Mongholic-Chin. 27. 1835.

蕹属 you shu

Cardioteucris C. Y. Wu.

Herbs, subshrubs, or shrubs, erect or climbing. Leaves opposite, simple, entire or dentate, usually with glistening glands. Flowers in lax or dense cymes often aggregate into thyrses, rarely solitary. Calyx (4- or) 5- (or 6)-dentate or -lobed. Corolla short tubed, slightly 2-lipped, margin entire or dentate; lobes 5, spreading; lower lobe larger, concave, fringed. Stamens 4, often strongly

thickly papery, abaxially densely gray tomentose, adaxially green and pubescent, base cuneate, apex obtuse. Inflorescences axillary or terminal, dense corymbose cymes; peduncle densely gray tomentose. Calyx campanulate, 2–4 mm, outside gray tomentose; lobes 5, lanceolate. Corolla greenish white to greenish yellow, ca. 5 mm, tube ca. 2 mm, lower lobe dentate to nearly fringed, both surfaces puberulent especially outside, villous at insertion of filaments. Stamens and style exerted. Ovary pubescent, apically glandular. Fruiting calyx 5–7 mm. Fruit ca. 2 mm in diam., hirsute, apical part glandular, nutlets winged, oblong-oblongate, ca. 3 mm, glabrous or with short spreading hairs near tip.

- 1700–4000 m. Guizhou, Sichuan, Xizang, Yunnan.

- 1a. Lower corolla lobe dentate; leaf blade 2–6 × 0.5–2.5 cm 3a. var. *forrestii*
1b. Lower corolla lobe nearly fringed; leaf blade 0.5–2 × 0.2–0.5 cm 3b. var. *minor*

3a. *Caryopteris forrestii* var. *forrestii*

灰毛蕨 hui mao you

Plants 30–120 cm tall. Leaf blade 2–6 × 0.5–2.5 cm. Lower corolla lobe dentate.

- Thickets on mountain slopes, in valleys, or along roadsides; 1700–3000 m. Guizhou, Sichuan, Xizang, Yunnan.

3b. *Caryopteris forrestii* var. *minor* P'ei & S. L. Chen ex C. Y. Wu, Fl. Yunnan. 1: 481. 1977.

小叶灰毛蕨 xiao ye hui mao you

Plants very short, much branched from base. Leaf blade 5–20 × 2–5 mm. Lower corolla lobe larger, nearly fringed.

- Dry mountain slopes; 2000–4000 m. SW Sichuan, SE Xizang, NW Yunnan.

4. *Caryopteris jinshajiangensis* Y. K. Yang & X. D. Cong, Bull. Bot. Res., Harbin 10(1): 45. 1990.

金沙江蕨 jin sha jiang you

Subshrubs 30–70 cm tall, usually branched from base. Branchlets densely brown tomentose when young, glabrescent. Petiole (0.2–)1–2 cm, densely puberulent; leaf blade broadly ovate to subrounded, (0.3–)1–3.2 × (0.4–)1–3 cm, papery, densely glandular, abaxially glaucous, margin entire or subentire, veins 3 or 4 pairs. Inflorescences axillary or terminal, corymbose cymes; peduncle slender, 0.5–2.2 cm, brown pilose. Calyx campanulate, 1.7–2.2 mm, lobes oblong-lanceolate, outside brown puberulent and glandular. Corolla tube 6–8 mm, puberulent at insertion of stamens, lower lobe slightly dentate. Stamens and style exerted. Ovary subglabrous. Fruit ovate-elliptic, 2.7–3.2 × 2–2.4 mm.

- Valleys; 1400 m. SW Yunnan (Jinsha Jiang valley).

Related to *Caryopteris forrestii* but differs in its broadly ovate to subrounded leaf blades and purplish corollas.

5. *Caryopteris incana* (Thunberg ex Houttuyn) Miquel, Ann. Mus. Bot. Lugduno-Batavum 2: 97. 1865.

兰香草 lan xiang cao

Herbs, perennial, 25–50 cm tall, aromatic, with woody base, pubescent. Petiole 0.3–1.7 mm; leaf blade narrowly lanceolate, lanceolate, oblong, or ovate, 1.5–9 × 0.4–4 cm,

thickly papery, pubescent, yellow glandular, base cuneate, subrounded, or truncate, margin coarsely serrate to rarely subentire, apex obtuse to acute. Inflorescences axillary or terminal, dense corymbose cymes. Calyx cup-shaped, ca. 2 mm, outside pubescent. Corolla purplish to bluish, tube ca. 3.5 mm, lower lobe fringed, both surfaces pubescent. Stamens and style exerted. Ovary pubescent. Fruiting calyx 4–5 mm. Fruit ca. 2.5 mm in diam., hirsute, nutlets with winged edges. Fl. and fr. Jun-Oct.

100–800 m. Anhui, Fujian, Guangdong, Guangxi, Hubei, Hunan, Jiangsu, Jiangxi, Taiwan, Zhejiang [Japan, Korea].

Medicinal.

- 1a. Leaf blade lanceolate, ovate, or oblong, 0.8–4 cm wide 5a. var. *incana*
1b. Leaf blade narrowly lanceolate, 0.4–0.8 cm wide 5b. var. *angustifolia*

5a. *Caryopteris incana* var. *incana*

兰香草 lan xiang cao

Nepeta incana Thunberg ex Houttuyn, Nat. Hist. 2(9): 307. 1778; *Barbula sinensis* Loureiro; *Caryopteris ovata* Miquel; *C. sinensis* (Loureiro) Dippel; *Mastacanthus sinensis* (Loureiro) Endlicher ex Walpers.

Leaf blade lanceolate, oblong, or ovate, 1.5–9 × 0.8–4 cm, apex obtuse to acute. Fl. and fr. Jun-Oct.

Slopes along roadsides; 100–800 m. Anhui, Fujian, Guangdong, Guangxi, Hubei, Hunan, Jiangsu, Jiangxi, Zhejiang [Japan, Korea].

5b. *Caryopteris incana* var. *angustifolia* S. L. Chen & R. L. Guo, Fl. Reipubl. Popularis Sin. 65(1): 213. 1982.

狭叶兰香草 xia ye lan xiang cao

Leaf blade narrowly lanceolate, 3–4.5 × 0.4–0.8 cm, apex acuminate. Fl. and fr. Sep-Oct.

- Thickets in stony places; 300 m. Jiangxi.

6. *Caryopteris tangutica* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, sér. 3, 27: 525. 1881.

光果蕨 guang guo you

Shrubs 0.5–2 m tall, erect. Branchlets gray tomentose. Petiole 0.4–1 cm; leaf blade lanceolate to ovate-lanceolate, 2–5.5 × 0.5–2 cm, abaxially densely gray tomentose, adaxially green pilose, base cuneate to rounded, margin deeply serrate, apex acuminate to obtuse, veins 5–8 pairs. Inflorescences axillary or subterminal, very dense corymbose cymes. Calyx ca. 2.5–4 mm, deeply 5-lobed, outside densely villous; lobes lanceolate, usually longer than tube. Corolla blue-purple, tube 5–7 mm, lower lobe fringed. Stamens and style exerted. Ovary glabrous. Fruiting calyx ca. 6 mm. Fruits obovate-globose, ca. 5 × 4 mm, glabrous, nutlets with broadly winged edges.

- Dry slopes; 2500 m. Gansu, Hebei, Henan, Hubei, Shaanxi, Sichuan.

7. *Caryopteris trichosphaera* W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 18. 1917.

毛球蕨 mao qiu you

Caryopteris incana (Thunberg ex Houttuyn) Miquel var. *brachyodonta* (Handel-Mazzetti) Moldenke; *C. tangutica* Maximowicz var. *brachyodonta* Handel-Mazzetti.

Shrubs 50–100 cm tall, aromatic. Branchlets pubescent and glandular when young. Petiole 3–9 mm or apical leaves subsessile; leaf blade ovate-oblong to broadly ovate, 1–3 × 1.5–3 cm, papery, pubescent, glandular especially abaxially, base rounded to truncate, margin coarsely serrate, apex obtuse; veins 6–8 pairs, abaxially prominent. Inflorescences axillary or terminal, dense cymes, densely villous; peduncle ca. 1 cm. Calyx campanulate, ca. 3 mm, lobes oblong-lanceolate, outside densely villous and glandular. Corolla bluish to purplish, ca. 6 mm, outside glabrous or nearly so except for lobes each with a distinct patch of villous to lanate hairs, pubescent at insertion of stamens, tube ca. 5 mm, lower lobe fringed. Stamens ca. 2 × as long as corolla tube. Ovary and style glabrous. Fruiting calyx ca. 6 mm. Fruit oblong to ovoid, 2–3 × 2 mm, nutlets with winged edges. Fl. and fr. Aug–Sep.

• Thickets on mountain slopes, dry grassy places in valleys; 2700–3300 m. W Sichuan, E Xizang, NW Yunnan.

Related to *Caryopteris tangutica* but differs in having leaf blades ovate-oblong to broadly ovate, both surfaces glandular, and calyces and corollas glandular outside.

8. *Caryopteris nepetifolia* (Benth) Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, sér. 3, 23: 390. 1877.

单花蕨 dan hua you

Teucrium nepetifolium Benth in A. de Candolle, Prodr. 12: 580. 1848.

Herbs, perennial, 30–60 cm tall, prostrate. Branches pubescent, 4-angled. Petiole ca. 3–10 mm, pubescent; leaf blade broadly ovate to subrounded, 1.5–5 × 1.5–4 cm, papery, pubescent, glandular, base broadly cuneate to rounded, margin coarsely serrate, apex obtuse, veins 3–5 pairs. Flowers axillary, solitary; bractlets short, linear. Pedicel slender. Calyx cup-shaped, ca. 6 mm, pubescent, glandular; lobes 5, ovate-lanceolate to ovate. Corolla bluish, tube 6–9 mm, lobes entire, lower lobe largest, outside sparsely puberulent and glandular. Stamens inserted near corolla throat; filaments basally hairy. Ovary densely pubescent. Nutlets ovoid, hirsute, without winged edges. Fl. and fr. May–Sep.

• Forest edges along streams and roadsides; 100–700 m. Anhui, Fujian, Jiangsu, Zhejiang.

Medicinal.

9. *Caryopteris terniflora* Maximowicz, Bull. Soc. Imp. Naturalistes Moscou 54(1): 40. 1879.

三花蕨 san hua you

Caryopteris terniflora f. *brevipedunculata* P'ei & S. L. Chen.

Shrubs 15–60 cm tall, erect, usually branched from base. Petiole 2–15 cm, pubescent; leaf blade lanceolate-oblong to ovate, 1.5–4 × 1–3 cm, papery, pubescent and glandular especially abaxially, base broadly cuneate to rounded, margin serrate, apex acute. Inflorescences axillary cymes, (1–)3(–)5-flowered; peduncle (0.1–)1–3 cm; bracts awl-shaped. Pedicel (0.5–)3–6 mm. Calyx campanulate, (4–)8–9 mm, 5-lobed, lobes lanceolate, both surfaces pubescent and glandular. Corolla pinkish to purple, 1.1–1.8(–)2 cm, 5-lobed, lower lobe broadly obovate to subrounded, outside sparsely puberulent and glandular. Stamens and style exerted. Ovary pubescent. Nutlets ovoid, densely hirsute, with distinctly reticulate veins. Fl. and fr. Jun–Sep.

• Mountain slopes in open places along streams; 600–2600 m. Gansu, Guizhou, Hebei, Henan, Hubei, Jiangxi, Shaanxi, Shanxi, Sichuan, Yunnan.

Medicinal.

10. *Caryopteris aureoglandulosa* (Vaniot) C. Y. Wu, Fl. Yunnan. 1: 484. 1977.

金腺蕨 jin xian you

Ocimum aureoglandulosum Vaniot, Bull. Acad. Int. Géogr. Bot. 14: 171. 1904.

Subshrubs 30–100 cm tall, erect to ascending. Branches 4-angled, densely puberulent. Petiole 1–5 mm; leaf blade ovate-lanceolate to ovate, 2–14 × 1.2–5 cm, membranous, densely puberulent when young, glabrescent, abaxially sparsely yellow glandular, base cuneate to subrounded, margin with 1–3 irregular serrations per side above middle, rarely subsentire, apex acute. Inflorescences axillary, 1–3-flowered, densely puberulent, cymes aggregated into poorly defined thyrses; peduncle 1–3(–)10 mm; bracts and bractlets linear. Pedicel ± as long as peduncle. Calyx campanulate, ca. 5 mm, sparsely puberulent; teeth 4 or 5, lanceolate to ovate-triangular, acuminate. Corolla white or pinkish, ca. 1.2 cm; tube ca. 8 mm, outside puberulent, inside glabrous. Stamens exerted. Ovary apically densely white puberulent. Style as long as stamens. Nutlets ovoid, puberulent, slightly reticulate. Fl. Apr.

• Grasslands; 600–800 m. S to W Guizhou, Hubei, SW Si-chuan, SW Yunnan.

11. *Caryopteris divaricata* Maximowicz, Bull. Acad. Imp. Sci. Saint-Petersbourg, sér. 3, 23: 390. 1877.

蕨 you

Clerodendrum divaricatum Siebold & Zuccarini (1846), not Jack (1820).

Herbs, perennial, ca. 80 cm tall. Branches 4-angled, subglabrous to pubescent. Petiole 0.5–2 cm; leaf blade ovate-oblong to ovate, 12–14 × 1.2–5 cm, membranous, sparsely pubescent, base cuneate to subrounded, margin coarsely serrate, apex acuminate to caudate, veins 3–5 pairs. Inflorescences axillary, cymes, dichotomous, sparsely pubescent; peduncle 2–3(–)11 cm; bracts linear to lanceolate. Calyx cup-shaped, broader than long, 2–4 mm, inside pubescent; teeth 5, triangular, 0.6–1 mm. Corolla pinkish to purple to pinkish, 1–2 cm, outside pubescent, villous in throat, tube 0.8–1.6 cm, lobes entire, lower lobe broadly obovate. Stamens and style exerted. Ovary pubescent, ± glandular, apex rudimentarily 4-lobed. Fruiting calyx twice as long as flowering calyx, broader than long. Nutlets pale brown ovoid, shorter than calyx tube, reticulate, glabrescent. Fl. and fr. Jul–Sep.

Mixed forests on mountain slopes and along roadsides; 700–2900 m. Gansu, Henan, Hubei, Jiangxi, Shaanxi, Shanxi, Sichuan [Japan, Korea].

12. *Caryopteris siccanea* W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 18. 1917.

腺毛蕨 xian mao you

Cardioteucris cordifolia C. Y. Wu.

Herbs, perennial, rhizomatous, 50–90 cm tall, usually unbranched, minutely hirsute, glandular. Petiole 3–8(–)10 cm, much shorter on apical leaves, minutely hirsute and sparsely

glandular; leaf blade broadly ovate, 6–12 × 5–10 cm, membranous, strigose, base cordate, margin with 8–15 serrations per side, apex acute. Inflorescences slender, lax terminal thyrses, sometimes also in most apical leaf axils, densely minutely hirsute, glandular; bracts linear-lanceolate to lanceolate, 1–6(–10) mm, shorter than pedicel. Calyx 5–7 mm, outside minutely hirsute and glandular, 2 lipped, lower lip 2-dentate, upper lip 3-dentate or rarely subentire in fruit. Corolla white, ca. 1.2 cm, outside puberulent. Stamens and style exerted. Fruit shallowly lobed; nutlets ca. 3 mm, glabrous, faintly ridged. Fl. Jun–Aug.

Open or forested slopes; 2000–3000 m. Sichuan, Yunnan [Myanmar].

13. *Caryopteris bicolor* (Roxburgh ex Hardwicke) Mabblerley in Manilal, Bot. Hist. Hort. Malab. 83. 1980.

香蕨 xiang you

Volkameria bicolor Roxburgh ex Hardwicke, Asiat. Res. 6: 366. 1799; *Caryopteris odorata* (D. Don) Robinson; *C. wallichiana* Schauer.

Shrubs 1–3 m tall, spreading. Branchlets 4-angled, gray minutely tomentose. Petiole 5–10 mm; leaf blade lanceolate-elliptic, 5.5–13 × 2–4 cm, papery, abaxially pubescent and glandular, adaxially subglabrous, base cuneate, margin subentire to serrate, apex acuminate. Inflorescences tight terminal thyrses, densely pubescent; bracts and bractlets lanceolate, to 1.5 cm, margins entire. Calyx 3–4.5 mm, usually 6-lobed, pubescent, densely glandular. Corolla bluish purple, tube ca. 5 mm, lobes ca. 8 mm, pubescent, glandular. Stamens

exserted. Ovary pubescent, glandular. Style longer than stamens. Fruiting calyx ca. 6 mm. Fruit subglobose, ca. 4 mm in diam. Fl. Mar.

Dry mountain slopes; 900–2000 m. Yunnan [Bhutan, India, Nepal, Thailand].

14. *Caryopteris paniculata* C. B. Clarke in J. D. Hooker, Fl. Brit. Ind. 4: 597. 1885.

锥花蕨 zhui hua you

Callicarpa esquirolii H. Léveillé; *C. martinii* H. Léveillé.

Shrubs 1–3 m tall, spreading, climbing, much branched, pubescent. Petiole 5–10 mm; leaf blade broadly lanceolate to ovate-lanceolate, 9–14 × 3–6.5 cm, thickly membranous, sparsely pubescent, densely yellow glandular, base broadly cuneate to rounded, margin sparsely serrate, apex caudate-acuminate; veins 5 pairs, abaxially prominent. Inflorescences axillary, paniculate, densely pubescent; bracts and bractlets minute. Calyx ca. 3 mm, 5- or 6-lobed, pubescent, densely glandular. Corolla pinkish, deep red, or purple, ca. 4 mm, tube ca. 2 mm, 5-lobed, outside pubescent and glandular. Stamens exerted. Style slightly longer than stamens. Fruiting calyx ca. 4 mm. Fruit usually orange at maturity, globose, ca. 2 mm in diam., pubescent, glandular, tardily breaking up. Fl. and fr. Mar–Sep.

Mixed forests on mountain slopes, along roadsides; 700–2300 m. Guangxi, W Guizhou, Sichuan, Yunnan [Bhutan, India, Myanmar, Nepal, Thailand].

16. **SCHNABELIA** Handel-Mazzetti, Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 58: 92. 1921.

四棱草属 si leng cao shu

Herbs, perennial. Rhizomes short, thick. Stems and twigs 4-angled, distinctly winged along edges. Leaves opposite, small, simple to deeply 3-lobed and almost palmate, usually early deciduous. Inflorescences axillary, simple cymes or reduced to 1 flower. Flowers usually of 2 kinds, open or cleistogamous. Calyx deeply 4- or 5-lobed, slightly enlarged in fruit, conspicuously 8–10-veined; lobes linear-lanceolate, equal or subequal. Stamens 4, didynamous. Ovary 4-locular; ovules 1 per locule. Stigma slightly 2-cleft. Open flowers with corolla longer than calyx, tube slender, 2-lipped, lower lip 3-lobed, upper lip erect and 2-lobed; stamens exerted; style longer than stamens. Cleistogamous flowers with corolla shorter than calyx; stamens and style shorter than corolla. Nutlets 4, obovate, puberulent, basally obscurely reticulate.

Two species: endemic to China.

The genus is sometimes included in Lamiaceae. There are collections that are somewhat intermediate between the two species.

- 1a. Cymes usually reduced to 1 flower; peduncle longer than 7 mm; calyx 5-dentate 1. *S. oligophylla*
1b. Cymes usually 1–3-flowered; peduncle less than 2 mm; calyx 4-dentate 2. *S. tetradonta*

1. *Schnabelia oligophylla* Handel-Mazzetti, Akad. Wiss. Wien, Math.-Naturwiss. Kl., Anz. 58: 93. 1921.

四棱草 si leng cao

Herbs 60–100(–120) cm tall, erect to climbing. Stems minutely puberulent, soon glabrous; internodes 0.5–8(–12) cm. Petiole 0.3–2.3 cm; leaf blade oblong, triangular-ovate, or ovate, sometimes deeply 3-lobed, 1–5 × 0.8–2 cm, papery, base cuneate, subrounded, or subcordate, margin serrate, apex short acuminate to acute. Cyme usually 1-flowered; bracts awl-shaped. Open flowers: Calyx 10-veined; teeth 5, 5–8 × 1 mm, margin entire, ciliate, apex acuminate. Corolla bluish purple to purple, 1.4–1.8 cm, tube ca. 12 × 2 mm; lower lip wedge-shaped to obovate-triangular, middle lobe 8–5.5 mm, lateral lobes 3–5 mm; upper lip broadly elliptic, ca. 4 × 3 mm. Cleistogamous flowers: Calyx ca. 3 mm. Corolla ca. 1.5 mm,

lower lip with middle lobe ca. 0.5 mm and lateral lobes ca. 0.2 mm; upper lip ovate to subrounded, ca. 0.2 mm. Nutlets ca. 5 × 2.8 mm.

• 600–1900 m. Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Sichuan, NE Yunnan.

Medicinal.

- 1a. Leaf blade 1–3 × 0.8–1.7 cm 1a. var. *oligophylla*
1b. Leaf blade 4–5 × 1.5–2 cm 1b. var. *oblongifolia*

1a. *Schnabelia oligophylla* var. *oligophylla*

四棱草 si leng cao

Petiole 3–9 mm; leaf blade ovate to triangular-ovate, 1–3 × 0.8–1.7 cm. Fl. and fr. Apr–Jun.

• Open forests in valleys in calcareous soil; 700 m. Fujian, Guangdong, Guangxi, Hainan, Hunan, Jiangxi, Sichuan.

1b. *Schnabelia oligophylla* var. *oblongifolia* C. Y. Wu & C. Chen in C. Chen, Acta Phytotax. Sin. 9: 11. 1964.

长叶四棱草 chang ye si leng cao

Petiole 1.8–2.3 cm; leaf blade oblong, 4–5 × 1.5–2 cm. Fl. Apr–May, fr. Oct.

• Forests; 600–1900 m. S Sichuan, NE Yunnan.

2. *Schnabelia tetradonta* (Sun) C. Y. Wu & C. Chen in C. Chen, Acta Phytotax. Sin. 9: 7. 1964.

四齿四棱草 si chi si leng cao

Chienodoxa tetradonta Sun, Acta Phytotax. Sin. 1: 22. 1951.

Herbs 30–70 cm tall. Stems erect, puberulent; internodes 0.5–6 cm. Petiole 3–8 cm; leaf blade ovate, 1–1.4 × 0.7–0.9 cm or smaller, papery, minutely hirsute, base cuneate, margin serrate, apex acute. Cymes 1–3-flowered. Open flowers unknown. Cleistogamous flowers: Calyx 8-veined; teeth 4, linear-lanceolate, 2.5 × 0.8 mm, entire, ciliate. Corolla ca. 1.5 mm, early deciduous, 2-lipped; lower lip 3-lobed, central lobe ca. 0.5 mm, acute, with lateral lobes similar to upper lobes of upper lip; upper lip erect, 2-lobed, lobes ovate, ca. 0.2 mm. Stamens 4, didynamous, shorter than corolla; disc cup-shaped. Ovary pubescent, ca. 0.5 mm. Style as long as ovary, glabrous. Fruiting calyx broadly lanceolate, 3.5–4 × 1.3 mm. Nutlets ca. 3 × 2 mm, pubescent. Fl. and fr. May–Jul.

• Mountain slopes in thickets; 500–1800 m. N Guizhou, C Sichuan.

17. SYMPHOREMA Roxburgh, Pl. Coromandel 2: 46. 1805.

六苞藤属 liu bao teng shu

Shrubs, usually climbing. Hairs stellate. Leaves opposite, simple, margin entire or serrate. Inflorescences pedunculate, capitate cymes, subtended by a whorl of 6 prominent involucre bracts. Calyx 5- or 6-dentate. Corolla white, small, tube cylindrical, lobes 6–16(–18). Stamens 6–16(–18). Ovary 2- or imperfectly 4-locular; ovules 2 per locule, pendulous, only 1 fertile. Capsules indehiscent, included within an enlarged calyx. Cotyledons fleshy, usually with abundant oil.

About three species: India, Myanmar, Philippines, and Thailand; one species in China.

1. *Symphorema involucreatum* Roxburgh, Pl. Coromandel 2: 46. 1805.

六苞藤 liu bao teng

Shrubs, climbing. Branchlets terete, hairy when young. Leaf blade subelliptic to ovate, puberulent when young, abaxially densely stellate tomentose, adaxially glabrescent,

base rounded to slightly cordate, margin subentire to dentate. Peduncle long, pubescent. Involucre bracts oblong, enlarged in fruit. Calyx 4–5 mm, outside tomentose, inside glabrous. Corolla white, 6–8 mm; lobes 6–8, narrowly oblong, 2–3 mm. Fruit subglobose, 4–6 mm in diam.

Forests; 500–800 m. S Yunnan [India, Myanmar, Sri Lanka, Thailand].

18. SPHENODESME Jack, Malayan Misc. 1: 19. 1820.

楔翅藤属 xie chi teng shu

Shrubs, climbing. Hairs simple or stellate. Stems lenticellate when young. Leaves opposite, short petiolate, margin entire. Inflorescences capitate cymes, 3–7-flowered, subtended by a whorl of 5 or 6 prominent involucre bracts. Calyx funnelliform, 5-dentate, sometimes enlarged or inflated in fruit. Corolla tube short cylindrical; lobes 5 (or 6), narrowly lanceolate to ovate-oblong. Stamens 5(–7); anthers ovate. Ovary imperfectly 2-locular; ovules 2 per locule, pendulous from apex of a placenta bearing axis. Stigma 2-cleft. Fruit indehiscent, small, obovoid to globose, included or nearly included in calyx, 1- (or 2)-seeded.

About 16 species: mainly in tropical and subtropical Asia, four species in China.

1a. Cyme 5-flowered; calyx glabrous 1. *S. pentandra*

1b. Cyme 7-flowered; calyx with pilose or stellate hairs.

2a. Hairs simple; involucre bracts oblanceolate-spatulate; calyx usually with accessory teeth; fruit hairy 2. *S. mollis*

2b. Hairs stellate; involucre bracts spatulate-lanceolate or obovate; calyx without accessory teeth; fruit glabrous.

3a. Leaf blade narrowly elliptic to ovate; involucre bracts oblanceolate; flowers 4- or 5-merous; stamens included 3. *S. involucreata*

3b. Leaf blade obovate-elliptic; involucre bracts spatulate-lanceolate; flowers 5- or 6-merous; stamens exerted 4. *S. floribunda*

1. *Sphenodesme pentandra* var. *wallichiana* (Schauer) Munir, Gard. Bull. Straits. Settlements, ser. 3, 21: 360. 1966.

山白藤 shan bai teng

Sphenodesme wallichiana Schauer in A. de Candolle, Prodr. 11: 622. 1847.

Indumentum of simple hairs. Branchlets 4-angled, densely pubescent when young, glabrescent. Petiole 0.5–1.5 cm; leaf blade lanceolate-oblong to elliptic-oblong, 5.5–18 × 2.5–7 cm, papery to thin leathery, subglabrous to pilose, adaxially usually shiny, base cuneate to rounded. Cymes capitate, 5-flowered; peduncle to 3 cm; involucre bracts 5 or 6, oblong-spatulate, 1.5–2.8 × 0.5–1 cm, glabrous. Calyx 4–7

mm, 5-dentate, with indistinct accessory teeth between main teeth, glabrous. Corolla purple, 5-lobed, pubescent in throat. Stamens 5, exserted. Ovary densely hispid, glandular. Capsules globose, ca. 4 mm in diam., yellow hispid. Fl. and fr. Feb-May.

Mixed forests; 500–700 m. Guangdong, Hainan, Yunnan [Bangladesh, Cambodia, India, Laos, Malaysia, Myanmar, Thailand, Vietnam].

Sphenodesme pentandra var. *pentandra* occurs in Indonesia, Laos, Malaysia, Thailand, and Vietnam but is absent from China.

2. *Sphenodesme mollis* Craib, Bull. Misc. Inform. Kew 1912: 154. 1912.

毛楔翅藤 mao xie chi teng

Sphenodesme annamitica Dop.

Indumentum of simple hairs. Branchlets slender, tomentose to pubescent when young, glabrescent. Leaf blade elliptic-oblong, 4–12 × 3.5–6(–8.5) cm, papery to thin leathery, tomentose to subglabrous, base cuneate. Cymes 7-flowered, arranged in loose terminal or axillary panicles; involucre bracts 6, oblanceolate-spatulate to spatulate, abaxially densely appressed pubescent, adaxially pilose. Calyx ca. 5 mm. Corolla mauve to purple, pubescent in throat; lobes 5, oblong. Stamens 5, exserted. Ovary ovate, hispid. Capsules enclosed in calyx, pilose-hispid. Fr. Oct-Nov.

Mixed forests on mountain slopes and along stream banks; 600–1500 m. S Yunnan [Thailand, Vietnam].

3. *Sphenodesme involucrata* (Presl) Robinson, Proc. Amer. Acad. Arts 51: 531. 1916.

爪楔翅藤 zhua xie chi teng

Vitex involucrata Presl, Bot. Bemerkungen 148. 1844; *Symphorema unguiculatum* Kurz.

Indumentum of simple and stellate hairs. Branchlets slender, with stellate hairs when young, glabrescent. Petiole ca. 1 cm, with dense stellate hairs; leaf blade narrowly elliptic to ovate, 6–13 × 3–7 cm, leathery, abaxially with stellate and simple hairs, base cuneate to subrounded, margin entire. Cymes 7-flowered, with rusty pilose and stellate hairs; peduncle with dense stellate hairs; involucre bracts oblanceolate to obovate. Calyx ca. 5 mm, nearly 2-lipped, 4- or 5-dentate, with yellow stellate hairs. Corolla white or pink, 4–6 mm, 4- or 5-lobed. Stamens 4 or 5, included. Ovary yellow, glabrous, apex glandular dotted. Capsules enclosed in calyx, glabrous. Fl. and fr. Nov-Jun.

Mixed forests; 500–700 m. Guangdong, Hainan, Taiwan [India, Malaysia].

4. *Sphenodesme floribunda* Chun & How, Acta Phytotax. Sin. 7: 79. 1958.

多花楔翅藤 duo hua xie chi teng

Bracts and young shoots with stellate hairs. Branchlets terete, prominently lenticellate, grayish rusty tomentose. Petiole 3–9 mm; leaf blade obovate-elliptic, 6–9 × 2–4 cm, glandular, abaxially pilose, base cuneate, margin entire or sinuate-dentate. Cymes 7-flowered; involucre bracts spatulate-lanceolate, 8–15 × 2–4 mm, membranous, densely rusty stellate pubescent. Calyx ca. 5 mm, densely yellowish rusty stellate pubescent; lobes 5 or 6, ovate-triangular, ca. 1 mm. Corolla ca. 9 mm, tube slender, white ciliate; lobes 5 or 6, oblanceolate, ca. 4 mm. Stamens 5, exserted. Ovary ca. 1.2 mm, glabrous. Style ca. 4 mm. Fl. Mar-Apr.

• Mixed forests; 300–700m. Guangdong, Hainan.

19. CONGEA Roxburgh, Pl. Coromandel 3: 90. 1820.

绒苞藤属 rong bao teng shu

Shrubs, climbing. Branchlets subterete, tomentose with stellate and/or simple hairs. Leaves opposite. Cymes capitate, 3–9-flowered, arranged in panicles, pedunculate; involucre bracts 4 or by fusion reduced to 3 with third bract deeply emarginate. Calyx funnelliform or campanulate, 5-dentate, slightly enlarged in fruit. Corolla with a slender tube, outside glabrous, pubescent in throat, 2-lipped, lower lip 3-cleft, upper lip 2-cleft. Stamens 4, didynamous, inserted at corolla throat; anthers subglobose. Ovary obovate, apex glandular, imperfectly 2-locular; ovules 2 per locule. Stigma capitate or shortly 2-cleft. Fruit obovate, indehiscent.

About ten species: mainly in SE Asia, two species in China.

- 1a. Leaf blade narrowly elliptic; involucre bracts narrowly oblong, 5–8 mm wide, basally united for ca. 6 mm, grayish 1. *C. chinensis*
1b. Leaf blade elliptic, broadly elliptic, or ovate; involucre bracts oblong, obovate-oblong, or broadly elliptic, 8–12 mm wide, basally united for 1–3 mm, blue-purple 2. *C. tomentosa*

1. *Congea chinensis* Moldenke, Phytologia 2: 311. 1947.

华绒苞藤 hua rong bao teng

Branchlets densely grayish pilose. Petiole to 7 mm, pilose; leaf blade narrowly elliptic, 8–14.5 × ca. 5 cm, abaxially densely pilose, base subrounded to cordate, margin entire, apex acuminate; veins abaxially prominent, pilose when young. Cymes 5–7-flowered, densely grayish pilose; peduncle 1–2 cm; involucre bracts 4, narrowly oblong, 2.5–3 × 0.5–0.8 cm. Calyx campanulate, 7–8 mm, outside densely white pilose, inside pubescent. Corolla grayish, ca. 7 mm, tube cylindrical. Stamens 4, long exserted. Ovary ca. 2 mm, glabrous. Fl. Oct.

Mixed forests; 700–1500 m. S Yunnan [Myanmar].

2. *Congea tomentosa* Roxburgh, Pl. Coromandel 3: 90. 1820.

绒苞藤 rong bao teng

Congea tomentosa var. *oblongifolia* Schauer.

Branchlets densely yellowish tomentose when young, becoming grayish. Petiole 5–13 mm, densely tomentose; leaf blade elliptic, broadly elliptic, or ovate, 6–16 × 3–9.5 cm, papery, abaxially densely pilose, adaxially densely pilose when young but becoming sparsely pilose to subglabrous, base rounded to subcordate, margin entire, apex acuminate to acute; veins 5 or 6, abaxially prominent. Cymes (5–)7(–9)-flowered, densely white pilose; involucre bracts 3 or 4, purple, oblong, obovate-oblong, or broadly elliptic, 2–3 × 0.8–1.2 cm, pubescent, base pilose. Calyx funnelliform, ca. 7 mm, lobes 1/2 as long as tube, outside densely pilose, inside pubescent. Corolla, glabrous except pilose in throat, tube longer than

calyx. Stamens long exserted. Ovary glabrous. Style exserted. Drupes enclosed in an enlarged calyx. $2n = 34$.

Mixed forests; 600–1200 m. SW Yunnan [Bangladesh, India, Laos, Myanmar, Thailand, Vietnam].

20. AVICENNIA Linnaeus, Sp. Pl. 1: 110. 1753.

海欖雌屬 hai lan ci shu

Shrubs or trees, maritime. Branches terete, sometimes 4-ridged when young. Leaves opposite. Inflorescences small spikes or capitula; bracts and bractlets ovate, shorter than calyx, persistent. Flowers small, opposite, sessile. Calyx cup-shaped, deeply 5-lobed; lobes overlapping, persistent. Corolla nearly actinomorphic, campanulate, shortly inserted on an inconspicuous disc; lobes 4 or 5, upper lobe often broader than others. Stamens 4, adnate to apical part of corolla tube. Ovary imperfectly 4-locular, with a free central winged placenta; ovules pendulous. Capsules subtended by persistent calyx, dehiscent into 2 leathery valves.

About 14 species: maritime in tropics and subtropics of both hemispheres, one species in China.

Avicennia is sometimes placed in the monogeneric family Avicenniaceae.

1. *Avicennia marina* (Forsskål) Vierhapper, Denkschr. Kaiserl. Acad. Wiss., Math.-Naturwiss. Kl. 71: 435. 1907.

海欖雌 hai lan ci

Sceura marina Forsskål, Fl. Aegypt.-Arab. 37. 1775.

Branchlets ridged when young. Leaves sessile; leaf blade elliptic to ovate, $2-7 \times 2-3.5$ cm, leathery, abaxially pubescent, adaxially glabrous and shiny, base acuminate, margin

entire. Inflorescences capitate; peduncle 1–2.5 cm. Flowers ca. 5 mm in diam. Calyx and corolla outside densely pubescent, inside subglabrous, margin densely persistent ciliate. Stamens slightly exserted. Ovary densely pubescent. Style short, 2-cleft. Fruit nearly ovoid, ca. 1.2 cm in diam., pubescent.

Maritime. Fujian, Guangdong, Hainan, Taiwan [E Africa, S and SE Asia, N Australia].