

STERCULIACEAE

梧桐科 wu tong ke

Tang Ya (唐亚)¹; Michael G. Gilbert², Laurence J. Dorr³

Trees or shrubs, rarely herbs or liana; young growth usually stellately hairy; bark mucilaginous and rich in fibers. Leaves alternate; stipules usually present caducous; leaf blade simple, rarely palmately compound, entire, serrate, or parted. Inflorescence axillary or rarely terminal, paniculate, corymbose, racemose, or cymose, rarely solitary. Flowers unisexual, bisexual or polygamous. Sepals (3–)5, ± connate, rarely free, valvate. Petals 5 or lacking, free or adnate to base of androecium, convolutedly imbricate. Androgynophore usually present; filaments usually connate into a single tube; staminodes 5, tongue-like or filiform, opposite to sepals, sometimes lacking; anthers 2-celled, longitudinally dehiscent. Pistil consisting of 2–5 (or 10–12) ± connate carpels, or a single carpel; ovary superior, 2–5 (or 10–12)-loculed; ovules 2 or more per locule; style 1 or as many as carpels. Fruit usually a capsule or follicle, dehiscent or indehiscent, very rarely a berry or nut. Seeds with abundant endosperm or endosperm lacking; embryo straight or curved.

About 68 genera and ca. 1100 species: tropics and subtropics of both hemispheres, a few in temperate regions; 19 genera (two introduced) and 90 species (39 endemic, three introduced) in China.

The Chinese genera fit into four distinct clades which can be treated as subfamilies of an enlarged Malvaceae or as distinct families. These are Sterculioideae/Sterculiaceae s.s. (genera 1–4), Helicteroideae/Helicteraceae (genera 5 and 6), Byttnerioideae/Byttneriaceae (genera 7–13), and Dombeyoideae/Pentapetaceae (genera 14–19).

The record of *Hildegardia* Schott & Endlicher in China (Bayer & Kubitzki, *Fam. Gen. Vasc. Pl.* 5: 265. 2003) was based on *H. major* (W. W. Smith) Kostermans, which is here included within *Firmiana*.

Hsue Hsiang-hao. 1984. Sterculiaceae. *In*: Feng Kuo-mei, ed., *Fl. Reipubl. Popularis Sin.* 49(2): 112–189.

- 1a. Flowers without petals, unisexual or polygamous; fruit apocarpous with separate follicles (Sterculioideae).
 - 2a. Follicles not dehiscent, with wing or prominent keel, 1-seeded; leaf blade abaxially with dense silver-white or yellow-brown scales 4. *Heritiera*
 - 2b. Follicles dehiscent, without wing or keel, 1- or more seeded; leaf blade abaxially without scales.
 - 3a. Seeds long-winged; fruit woody 1. *Pterygota*
 - 3b. Seeds not winged; fruit leathery or membranous, rarely woody.
 - 4a. Fruit leathery, rarely woody, dehiscent when mature 2. *Sterculia*
 - 4b. Fruit membranous, dehiscent before maturity and foliaceous 3. *Firmiana*
- 1b. Flowers with petals, bisexual; fruit usually syncarpous, sometimes dividing into separate mericarps.
 - 5a. Ovary on long androgynophore, at least 2 × as long as ovary, often longer than calyx and petals.
 - 6a. Capsule membranous, inflated; seeds 1 (or 2) in each cell (Byttnerioideae) 7. *Kleinhovia*
 - 6b. Capsule more or less woody, never membranous, not inflated; seeds 2 or more in each cell (Helicteroideae).
 - 7a. Trees or large shrubs, 6–25 m tall; seeds 1 or 2 per locule, with obvious membranous wing, more than 20 mm; inflorescences terminal; anthers sessile on filament tube or nearly so 5. *Reevesia*
 - 7b. Shrubs or subshrubs, 0.45–2 m tall; seeds many per locule, without wing, less than 4 mm; inflorescences axillary; anthers with distinct free filaments 6. *Helicteres*
 - 5b. Ovary sessile or with very short androgynophore (*Pterospermum*).
 - 8a. Flowers without staminodes.
 - 9a. Trees or shrubs; calyx 10–30 mm; stamens 40–50; capsule 3–5 cm, woody or thickly leathery (Dombeyoideae) 14. *Eriolaena*
 - 9b. Herbs or subshrubs; calyx 2–4 mm; stamens 5; capsule 0.3–0.6 cm, membranous (Byttnerioideae).
 - 10a. Capsule 5-celled; styles 5, free or connate at the base only; stigma slightly thickened 8. *Melochia*
 - 10b. Capsule 1-celled; style 1; stigma fimbriate 9. *Waltheria*
 - 8b. Flowers with staminodes.
 - 11a. Flowers cauliflorous, in fascicles on trunk or bases of main branches; fruit fleshy, not dehiscent; seeds without wing (Byttnerioideae) 10. *Theobroma*
 - 11b. Flowers on branchlets; fruit a capsule, dehiscent; seeds with or without wing.
 - 12a. Stamens 5, solitary.
 - 13a. Semi-shrubs or herbs; flowers solitary; petals persistent (Dombeyoideae) 19. *Melhania*
 - 13b. Trees or large woody liana; flowers in cymes; petals not persistent (Byttnerioideae).

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- 14a. Lianas; staminodes obtuse at tip, lower half connate into tube; capsule with robust and rigid spines, loculicidal into 5 valves 12. *Byttneria*
- 14b. Trees; staminodes linear-lanceolate, free; capsule densely hispid, septicidal 13. *Commersonia*
- 12b. Stamens (10 or)15(or 20), in 5 fascicles of (2 or)3(or 4), alternating with staminodes (mostly Dombeyoideae).
- 15a. Herbs.
- 16a. Petals red; capsule ovate-globose 15. *Pentapetes*
- 16b. Petals yellow; capsule long cylindrical 16. *Corchoropsis*
- 15b. Trees or shrubs, rarely woody climbing lianas.
- 17a. Seeds with long membranous wing; staminodes filiform 17. *Pterospermum*
- 17b. Seeds wingless; staminodes tongue-shaped or broadly spatulate.
- 18a. Capsule without wing; staminodes tongue-shaped, glabrous; ovules 2 per cell 18. *Paradombeya*
- 18b. Capsule 5-winged; staminodes broadly spatulate, emarginate and with grooves at tip, hairy; ovules many per cell (Byttnerioideae) 11. *Ambroma*

1. PTERYGOTA Schott & Endlicher, Melet. Bot. 32. 1832.

翅苹婆属 chi ping po shu

Trees. Leaves cordate, usually entire, but lobed when very young. Inflorescence axillary, racemose or paniculate. Flowers unisexual. Calyx campanulate, 5-lobed to base, lobes reflexed at apex. Petals absent. Male flowers: androgynophore cylindrical, enclosed by calyx, apex cup-shaped. Filaments clustered into 5 groups, staminodes usually present; anthers sessile. Female flowers: androgynophore very short, with 5 undeveloped staminodes. Carpels almost free; ovules many per carpel; stigma swollen, radiate. Follicle woody, subglobose, with long stipe and many seeds. Seeds with long and wide apical wing.

About 20 species: African and Asian tropics; one species in China.

1. *Pterygota alata* (Roxburgh) R. Brown, *Pterocymbium*, 234. Jun 1844.

翅苹婆 chi ping po

Sterculia alata Roxburgh, Pl. Coromandel 3: 84. 1811 ["1819"]; *Pterygota roxburghii* Schott & Endlicher, nom. illeg. superfl.

Big trees, up to 30 m tall; bark gray or brown-gray. Branchlets pubescent at first with golden yellow hairs. Stipules subulate, caducous; petiole 5–15 cm; leaf blade cordate or broadly ovate, 13–35 × 10–17 cm, both surfaces glabrescent, base truncate, cordate or rounded, margin nearly entire, apex acute or obtuse. Inflorescence axillary, paniculate, shorter than petiole. Flowers sparse, red; pedicels nearly absent. Calyx campanulate, 17–20 mm, lobes linear-lanceolate, densely puberulent.

Male flowers: androgynophore cylindrical cone-shaped, 1/2 as long as calyx, puberulent. Anthers ca. 20, 3–5 grouped into fascicles on top of androgynophore; undeveloped carpels apparent. Female flowers: androgynophore very short. Ovary globose and puberulent; ovules 40–50 per carpel, in 3 rows; styles 5, curved, pubescent. Follicle woody, compressed globose, ca. 12 cm in diam., puberulent outside, adaxially cork-like. Seeds many, oblong, flat, ca. 7 cm including long and wide wing. Fr. Dec.

Open forests. S Hainan, Yunnan [Bangladesh, Bhutan, India, Malaysia, Myanmar, Philippines, Thailand, Vietnam].

The place of publication of *Pterygota alata* is often given as R. Brown in Bennett, Pl. Jav. Rar. 234. 1844, which was published in November 1844 and was thus predated by Brown's preprint published in June of the same year.

2. STERCULIA Linnaeus, Sp. Pl. 2: 1007. 1753.

苹婆属 ping po shu

Trees or shrubs. Leaves simple, entire or palmately lobed, rarely palmately compound, margin entire or dentate. Inflorescence usually axillary, usually paniculate, rarely racemose. Flowers unisexual. Calyx 5-lobed or 5-partite. Petals absent. Male flowers: anthers clustered at top of androgynophore, enclosing undeveloped carpels. Female flowers: androgynophore very short, staminodes at top of androgynophore in whorl around base of carpels. Carpels 5; ovules 2 to many per carpel; styles connate at base; stigmas as many as carpels, free. Fruit a group of follicles, usually leathery, less often woody, dehiscent when mature. Seeds 1 to many per follicle, usually with endosperm.

Between 100 and 150 species: tropics and subtropics of both hemispheres, most abundant in Asian tropics; 26 species (14 endemic, one introduced) in China.

The fruits of nine species and male and/or female flowers of a further four species have not been recorded, indicating that the Chinese members of this genus require much more study in the field.

Sterculia bodinieri H. Léveillé is the basionym of *Phyllanthus bodinieri* (H. Léveillé) Rehder in the Euphorbiaceae s.l. (see Fl. China 11).

- 1a. Leaves palmately compound, leaflets 7–9.
- 2a. Calyx divided for ca. 1/2 length or slightly more, lobes incurved, calyx tube well developed, campanulate; leaflet blades with lateral veins dense and apparent 1. *S. pexa*
- 2b. Calyx divided to base, lobes recurved, calyx tube absent; leaflet blades with lateral veins lax and obscure 2. *S. foetida*
- 1b. Leaves simple.
- 3a. Leaf blade palmately divided, abaxially and adaxially densely brown tomentose, very densely so abaxially 3. *S. villosa*
- 3b. Leaf blade not divided.
- 4a. Leaf blade abaxially densely hairy.
- 5a. Leaf blade base obtuse, subrounded, or obliquely cordate.
- 6a. Leaf blade usually ovate-elliptic, base more or less obliquely cordate, basal veins 5, petiole ca. 5 cm 11. *S. euosma*
- 6b. Leaf blade elliptic, base rounded or obtuse, basal veins 1, petiole 1–2 cm 12. *S. tonkinensis*
- 5b. Leaf blade base cuneate.
- 7a. Leaf blade with one obvious pair of basal veins, abaxially not very densely hairy; epicalyx lobes as long as pedicels 13. *S. cinnamomifolia*
- 7b. Leaf blade without a pair of basal veins, abaxially very densely hairy; epicalyx lobes much longer than pedicels 14. *S. pinbienensis*
- 4b. Leaf blade abaxially glabrous or sparsely hairy only on veins.
- 8a. Veins of old leaf blade abaxially sparsely stellate.
- 9a. Lateral veins and veinlets apparently impressed adaxially, veinlets prominently raised abaxially, purple-red when dried 4. *S. impressinervis*
- 9b. Lateral veins and veinlets not impressed adaxially, veinlets not impressed abaxially, not purple-red when dried.
- 10a. Lateral veins 16–24 on each side of midrib, petiole 0.8–1 cm; calyx lobes much longer than calyx tube 5. *S. hymenocalyx*
- 10b. Lateral veins 11 or 12 on each side of midrib, petiole 3–8 cm; calyx lobes as long as calyx tube 7. *S. micrantha*
- 8b. Veins of old leaf blade abaxially glabrous.
- 11a. Leaf blade base cordate 10. *S. ceramica*
- 11b. Leaf blade base not or only slightly cordate.
- 12a. Petiole to 1.2 cm 20. *S. brevissima*
- 12b. Petiole at least 1.5 cm.
- 13a. Lateral veins 12–20 on each side of the midrib.
- 14a. Branchlets densely hairy.
- 15a. Leaf blade apex acute, base decurrent, cuneate or obtuse, petiole 1.5–3 cm; calyx green, subglabrous 16. *S. gengmaensis*
- 15b. Leaf blade apex acuminate, base rounded to shallowly cordate, cuneate or acute, petiole 2.5–5.5 cm; calyx red or purple, exterior stellate hairy.
- 16a. Inflorescence rachis indumentum yellow-brown; leaf blade base rounded or cuneate; epicalyx lobes as long as pedicels 17. *S. henryi*
- 16b. Inflorescence rachis indumentum purple; leaf blade base shallowly cordate; epicalyx lobes ca. 1/2 as long as pedicels 18. *S. simaoensis*
- 14b. Branchlets glabrous or nearly so.
- 17a. Calyx tube well developed, campanulate; leaves clustered at branchlet tip 8. *S. kingtungensis*
- 17b. Calyx divided to near base, lobes ± free; leaves not clustered.
- 18a. Leaf blade 12–18 cm wide, petiole 5–12 cm; sepals ca. 20 mm 15. *S. scandens*
- 18b. Leaf blade 2.5–6 cm wide, petiole 1.5–2.5 cm; sepals ca. 6 mm 24. *S. hainanensis*
- 13b. Lateral veins 6–10 on each side of the midrib.
- 19a. Leaf blade obovate or narrowly obovate, 13–26 × 7–10 cm, apex rounded or with short acumen, lateral veins 5–9 25. *S. yuanjiangensis*
- 19b. Leaf blade not as above, apex not rounded.
- 20a. Base and apex of petiole pulvinate.
- 21a. Petiole 2.5–3.5 cm 23. *S. lanceifolia*
- 21b. Petiole 1–1.5 cm 26. *S. guangxiensis*
- 20b. Petiole not pulvinate.
- 22a. Calyx campanulate, lobes as long as calyx tube.

- 23a. Leaf blade oblong or elliptic, base rounded or obtuse 6. *S. monosperma*
 23b. Leaf blade oblanceolate or elliptic-obovate, base acute or
 cuneate 9. *S. subracemosa*
 22b. Calyx divided almost to base, lobes ± free.
 24a. Sepals 10–20 mm, incurved and cohering with each other at
 apex 19. *S. principis*
 24b. Sepals 4–8 mm, spreading, starlike.
 25a. Inflorescence 10–18 cm; sepals ca. 8 mm, apex
 acuminate; leaf blade with 5 basal veins 21. *S. subnobilis*
 25b. Inflorescence less than 10 cm; sepals 4–6 mm, apex
 obtuse or with short acumen; leaf blade with 1–3
 basal veins 22. *S. lanceolata*

1. *Sterculia pexa* Pierre, Fl. Forest. Cochinch. t. 182. 1888.

家麻树 jia ma shu

Sterculia pexa var. *yunnanensis* (Hu) H. H. Hsue; *S. yunnanensis* Hu.

Trees. Branchlets robust. Leaves palmately compound; stipules triangularly lanceolate, ca. 5 mm, pilose; petiole usually 20–23 cm; leaflets 7–9; leaflet blades obovate-lanceolate or narrowly elliptic, 9–23 × 4–6 cm, abaxially densely stellate pubescent, adaxially nearly glabrous, lateral veins 22–44, parallel, base cuneate, margin entire, apex acuminate. Inflorescence clustered at branchlet tips, racemose or paniculate, up to 20 cm. Epicalyx lobes linear-lanceolate, ca. 1 cm. Calyx white, campanulate, ca. 6 mm, divided to 1/2 length, abaxially densely stellate pubescent, lobes triangular, apex acuminate, incurved and apically coherent with each other. Male flower: androgynophore linear, glabrous. Anthers 10–20, capitate. Female flower: ovary globose, 5-locular, densely puberulent. Style very short; stigma 5-branched. Follicle brownish red, ellipsoid and slightly curved to sickle-shaped, 4–9 × 2–4 cm, 3-seeded, abaxially densely puberulent and hispid, adaxially stellate hairy, margin densely ciliate, apex obtuse. Seeds black, oblong, ca. 1.5 cm. Fl. Oct.

Sunny dry slopes, roadsides, cultivated around villages. SW Guangxi, S and SE Yunnan [Laos, Thailand, Vietnam].

The bark fiber is used for making rope or other similar purposes. The seeds are edible after boiling. The timber is good for furniture.

2. *Sterculia foetida* Linnaeus, Sp. Pl. 2: 1008. 1753.

香苹婆 xiang ping po

Trees. Branches verticillate and spreading. Leaves apically clustered, palmately 7–9-foliolate; stipules arrow-shaped, caducous; petiole 10–20 cm; leaflet blades elliptic-lanceolate, 10–15 × 3–5 cm, at first pilose, glabrescent when mature, base cuneate, margin entire, apex long acuminate or caudate. Inflorescence apical on branchlets, paniculate, erect, many-flowered. Pedicels shorter than flowers. Epicalyx lobes minute. Calyx purple-red, ca. 12 mm, divided nearly to base, lobes elliptic-lanceolate, abaxially yellowish brown pubescent, adaxially upper half white villous. Male flowers: stamens 12–15, capitate. Female flowers: carpels 5, hairy. Style curved; stigma 5-divided. Follicle ellipsoid and boat-shaped, 5–8 cm, woody, nearly glabrous, apex acute into beak, 10–15-seeded. Seeds black, ellipsoid, ca. 1.5 cm, smooth. Fl. Apr–May.

Cultivated. Guangdong (Guangzhou), Guangxi, S Hainan (Sanya) [Cambodia, India, Indonesia, ?Malaysia, Myanmar, Philippines, Sri Lanka, Thailand, Vietnam; native to India, now cultivated in tropical Africa, N Australia, and South America].

Sterculia foetida seems to be a rather weedy species of uncertain origin. The seeds are edible after toasting and taste like chestnuts (*Castanea sativa* Miller); they also contain an oil that is used medicinally, while the timber is used for making furniture and the bark for rope.

3. *Sterculia villosa* Roxburgh, Fl. Ind., ed. 1832, 3: 153. 1832.

绒毛苹婆 rong mao ping po

Sterculia armata Masters; *S. lantsangensis* Hu; *S. ornata* Wallich ex Kurz.

Trees; bark gray-white. Branchlets robust, with leaf scars, brown stellate pubescent when young. Leaves simple; stipules lanceolate, ca. 1 cm; petiole robust, ca. 16 cm, pilose; leaf blade palmately 3–7-lobed, 17–22 cm, abaxially densely yellow-brown stellate tomentose, adaxially sparsely pubescent, base broadly cordate, central lobe broadly ovate, ca. 8 × 8 cm at base, apex caudate. Inflorescence subterminal on branchlets, paniculate, densely ferruginous stellate tomentose. Calyx yellow, campanulate, ca. 1 cm, tube ca. 4 mm, abaxially pubescent, adaxially glabrous, lobes lanceolate, apex acuminate, ca. 6 mm, spreading outward. Male flowers: androgynophore curved, glabrous. Stamens 10. Female flowers: ovary globose. Style curved downward, hairy. Follicles narrowly ellipsoid, 3–5 cm, both surfaces densely ferruginous villous, apex shortly beaked. Seeds black, oblong. Fl. Feb, fr. Apr–Oct.

Mixed forests in gullies, also cultivated near villages; 500–1500 m. SW Yunnan [Bhutan, Cambodia, India, Myanmar, Nepal, Thailand].

4. *Sterculia impressinervis* H. H. Hsue, Acta Phytotax. Sin. 15(1): 82. 1977.

凹脉苹婆 ao mai ping po

Trees or shrubs. Branchlets gray-brown when dried, at first stellate pilose. Leaves simple; stipules ovate, hairy, apex acute, caducous; petiole 3–6.5 cm, swollen at both ends, minutely pilose; leaf blade elliptic-oblanceolate, 7–17 × 6–9.5 cm, thinly leathery, abaxially subglabrous, midrib and veins yellowish brown puberulent, veins drying purple-red, adaxially glabrous, with veins obviously impressed, lateral veins 14–16 on each side of midrib, curved upward, base obtuse, margins entire or slightly sinuate, apex caudate or long acuminate. Flowers un-

known. Follicles purple-red when dried, oblong, ca. 5.5×1.5 – 1.8 cm, 4- or 5-seeded, densely purple-brown stellate tomentose, apex with 1–1.2 cm beak. Seeds purple-red, globose or flattened reniform, ca. 1 cm in diam.

- SE Yunnan (Malipo).

5. *Sterculia hymenocalyx* K. Schumann, Bot. Jahrb. Syst. 24(Beibl. 58): 18. 1897.

膜萼苹婆 mo e ping po

Shrubs. Branchlets stellate puberulent, leaves several, nearly verticillate, bud scales many, persistent near tip, linear-lanceolate, 5–15 mm, longer than petiole, with yellowish brown branched hairs. Leaves simple; stipules mixed with bud scales; petiole 8–10 mm, hairy; leaf blade obovate or oblanceolate, 24 – 37×9 – 13 cm, papery or thinly leathery, dark green when dried, abaxially sparsely stellate on midrib and lateral veins, adaxially glabrous, lateral veins 16–24 on each side of midrib, curved upward, base decurrent, cuneate or obtuse, apex obtuse or obtusely lanceolate. Inflorescence paniculate, terminal or axillary, 5–10 cm, with reddish yellow hairs. Pedicels slender. Epicalyx lobes linear, 5–7 mm, caducous. Calyx whitish or pink, up to 16 mm, calyx tube ca. 3 mm, abaxially hairy, adaxially glabrous, lobes ca. 12 mm, spreading starlike. Male flowers: androgynophore glabrous, reflexed, ca. 7 mm. Female flowers: ovary globose, sessile, densely hairy; ovules 5–8 per carpel. Style reflexed, hairy, as long as ovary; stigma sinuately 5-divided. Follicles 3–5, \pm olive-shaped, 5 – $8 \times$ ca. 2 cm before dehiscence, thickly papery, abaxially densely orange villous, adaxially glabrous, base attenuate into long and slender stipe, apex attenuate. Seed ellipsoid, ca. 1 cm. Fr. May.

Forests; 100–300 m. SE Yunnan (Hekou) [Vietnam].

6. *Sterculia monosperma* Ventenat, Jard. Malmaison 2: t. 91. 1805.

苹婆 ping po

Trees; bark brown-black. Branchlets at first minutely stellate. Leaves simple; stipules caducous; petiole 2–3.5 cm; leaf blade oblong or elliptic, 8 – 25×5 – 15 cm, thinly leathery, glabrous, base rounded or obtuse, apex acute or obtuse. Inflorescence terminal or axillary, paniculate, slender and lax, to 20 cm, pubescent. Pedicels much longer than flowers. Calyx cream-white, becoming reddish, campanulate, ca. 10 mm, abaxially pubescent, lobes linear-lanceolate, as long as calyx tube, apex acuminate, incurved and cohering apically, as long as calyx tube. Male flowers many, androgynophore curved, glabrous, anthers yellow. Female flowers fewer, slightly larger. Ovary globose, with 5 grooves, densely hairy; style curved; stigma shallowly 5-lobed. Follicles red, oblong-ovate, ca. 5×2 – 3 cm, 1–4-seeded, thickly leathery, apex beaked. Seeds black-brown, ellipsoid or oblong, ca. 1.5 cm. Fl. Apr–May, rarely Oct–Nov.

Dense forests, also often cultivated. SE Fujian, S Guangdong, Guangxi, Taiwan, S Yunnan [India, Indonesia, Malaysia, Thailand, Vietnam].

- 1a. Leaf blade base rounded or obtuse;
bark brownish black 6a. var. *monosperma*

- 1b. Leaf blade base cuneate or obtuse;
bark gray with sparse spots 6b. var. *subspontanea*

6a. *Sterculia monosperma* var. *monosperma*

苹婆(原变种) ping po (yuan bian zhong)

Sterculia nobilis Smith.

Bark brownish black. Leaf blade base rounded or obtuse.

Often cultivated. SE Fujian, S Guangdong, S Guangxi, Taiwan, S Yunnan [India, Indonesia, Malaysia, Thailand, Vietnam].

6b. *Sterculia monosperma* var. *subspontanea* (H. H. Hsue & S. J. Xu) Y. Tang, M. G. Gilbert & Dorr, **comb. nov.**

野生苹婆 ye sheng ping po

Basionym: *Sterculia nobilis* Smith var. *subspontanea* H. H. Hsue & S. J. Xu, J. S. China Agric. Univ. 8(3): 3. 1987.

Bark gray, with sparse spots. Leaf blade base cuneate or obtuse.

- Dense forests. SW Guangxi.

7. *Sterculia micrantha* Chun & H. H. Hsue, J. Arnold Arbor. 28: 328. 1947.

小花苹婆 xiao hua ping po

Trees. Branchlets robust, with wide pith and conspicuous leaf scars. Leaves simple; petiole 3–8 cm, minutely stellate; leaf blade oblong-ovate, 7 – 14×3.5 – 6.5 cm, abaxially sparsely stellate villous on veins, adaxially nearly glabrous, lateral veins 11 or 12 on each side of midrib, base obtuse, apex obtuse or acute. Inflorescence paniculate, slender, ca. 26 cm. Pedicels 3–4 mm, articulate. Calyx white, campanulate, very thin, 5–6 mm, abaxially minutely pubescent, adaxially hairy only near lobe margin, mucronate, lobes triangular-lanceolate, as long as calyx tube, margins densely hairy. Male flowers: androgynophore slender, ca. 3 mm, glabrous. Anthers 10. Female flowers: androgynophore ca. 1.5 mm. Ovary globose, villous. Fruits unknown. Fl. Oct.

- Open forests; ca. 1400 m. S Yunnan.

8. *Sterculia kingtungensis* H. H. Hsue ex Y. Tang, M. G. Gilbert & Dorr, **nom. nov.**

大叶苹婆 da ye ping po

Replaced synonym: *Sterculia megaphylla* H. T. Tsai & P. I Mao, Acta Phytotax. Sin. 9: 202. 1964, not *Sterculia megaphylla* Bureau & J. Poisson ex Guillaumin, Bull. Soc. Bot. France 67: 122. 1920.

Trees, to 10 m tall; bark gray. Branchlets robust, terete, with large leaf scars. Leaves large, simple, apically clustered; stipule linear, ca. 1 cm, glabrous; petiole slender, 6–7 cm, grooved, nearly glabrous; leaf blade elliptic-oblong, to 28×14 cm, abaxially and adaxially glabrous, lateral veins ca. 17 on each side of midrib, parallel, prominently raised abaxially, venation lax, base broadly cuneate, apex abruptly shortly acuminate. Inflorescence paniculate, apically clustered, ca. 12 cm, sparsely and minutely rust-colored hairy. Pedicel slender, artic-

ulate. Calyx red, campanulate, lobes lanceolate, ca. 6 mm, slightly longer than calyx tube, incurved and cohering apically with each other, abaxially minutely puberulose, adaxially mucronate, margins ciliate. Androgynophore slender, curved, ca. 4 mm, glabrous. Anthers 10. Fruits unknown. Fl. Apr–May.

- Streamsides or riversides; ca. 1600 m. S Yunnan (Jingdong).

The earlier intended nomen novum "*Sterculia kingtungensis*" (H. H. Hsue, Acta Phytotax. Sin. 15(1): 74. 1977) was not validly published because a full and direct reference to the place of publication of the replaced synonym was not given (*Vienna Code*, Art. 33.4).

9. *Sterculia subracemosa* Chun & H. H. Hsue, J. Arnold Arbor. 28: 328. 1947.

信宜苹婆 xin yi ping po

Shrubs, ca. 3.5 m tall. Branchlets slender, drying red-brown, sparsely stellate pilose. Leaves simple; petiole 1.5–2.5 cm, minutely puberulent, petiole and leaf blade with black dots; leaf blade oblanceolate or elliptic-obovate, 11–18 × 4–6.5 cm, abaxially and adaxially glabrous, with venation apparent, lateral veins 8–10 on each side of midrib, interlinked submarginally, base acute or cuneate, apex obtuse or shortly acute. Inflorescence racemose, slender, ca. 9 cm, densely yellow-brown puberulent. Pedicel 8–10 mm. Epicalyx lobes linear-lanceolate, ca. 2 mm. Calyx white to pink or orange-red, ca. 13 mm, exterior puberulent, interior hairy only on upper part of segments, tube campanulate, lobes ovate-lanceolate, slightly longer than tube, margins sparsely hairy. Male flowers: androgynophore slender. Female flowers: staminodes ca. 17. Ovary globose, ca. 1.5 mm in diam., densely puberulent; style hairy; stigma 5-divided. Fruits unknown. Fl. Mar–Apr.

- Dense forests in gullies and on slopes; 500–6000 m. Guangdong (Xinyi), Guangxi (Daqing Shan).

10. *Sterculia ceramica* R. Brown, *Pterocymbium*, 233. Jun 1844.

台湾苹婆 tai wan ping po

Sterculia luzonica Warburg; ?*S. richardiana* Baillon.

Small trees. Leaves simple; petiole 3–5 cm, minutely pilose; leaf blade ovate or elliptic-ovate, 8–17 × 7–9 cm, papery or thinly leathery, abaxially and adaxially glabrous or minutely yellowish brown stellate between basal veins, basal veins 5–7, base cordate, margin entire, apex acuminate or acute. Inflorescence paniculate, flat-topped, axillary. Pedicels ca. 11 mm. Male flowers: calyx ellipsoid, ca. 5 mm, lobes triangular, 1/3 as long as calyx, spreading outward. Female flowers: ovary 5-lobed, with 5 longitudinal grooves, densely puberulent. Style very short; stigmas 5, globose. Follicle ovoid sickle-shaped, 3–6 × 2.5–3 cm, thickly leathery, 2-seeded, abaxially reddish brown hairy, apex obtuse. Seeds nearly ellipsoid, 1.5–2 cm. Fl. Jun.

Taiwan (Huoshao Dao, Lan Yu) [Malaysia, Philippines; Madagascar].

The apparent disjunction of *Sterculia ceramica* between SE Asia and Madagascar is noteworthy. The place of publication of *S. ceramica* is often given as R. Brown in Bennett, Pl. Jav. Rar. 233. 1844, which was published in November 1844 and was thus predated by Brown's preprint published in June of the same year.

11. *Sterculia euosma* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 10: 72. 1917.

粉苹婆 fen ping po

Trees. Young branchlets densely yellowish brown villous, glabrescent. Petiole ca. 5 cm; leaf blade ovate-elliptic, 12–24 × 7–12 cm, leathery, abaxially densely yellowish brown stellate villous, adaxially glabrous or nearly glabrous; basal veins 5, base rounded or nearly obliquely cordate, apex shortly acuminate. Inflorescence racemose, clustered subapically on branchlets, produced simultaneously with new leaves, minutely yellowish brown villous. Pedicels 1–1.5 cm. Calyx dark red, ca. 1 cm, divided nearly to base, lobes linear-lanceolate, abaxially pubescent, adaxially glabrous. Androgynophore ca. 2 mm. Ovary ovoid, densely hairy; style curved, villous. Follicle red when mature, oblong or oblong-ovate, 6–10 × ca. 3 cm, abaxially densely stellate villous, apex acuminate into beak. Seeds black, ovoid, ca. 2 cm.

- Dense forests, forests on rocky slopes; ca. 2000 m. SW Guangxi, S Guizhou, Xizang, SW Yunnan (Tengchong).

12. *Sterculia tonkinensis* Aug. Candolle, Bull. Herb. Boissier, sér. 2, 3: 368. 1903.

北越苹婆 bei yue ping po

Small trees or shrubs. Branchlets sparsely brown stellate hairy, glabrescent. Leaves simple; stipules triangular, 5–10 mm; petiole 1–2 cm, hairy; leaf blade elliptic, 11–21 × 5.5–10 cm, thinly leathery, abaxially densely yellowish brown villous, adaxially glabrous and glossy, lateral veins 6–9 on each side of midrib, curved upward, interconnected submarginally, base rounded, apex shortly acuminate or obtuse. Inflorescence paniculate, apically clustered, 8–9 cm, hairy. Flowers stellate. Pedicel linear, ca. 1 cm. Epicalyx lobes triangular, 1–3 mm. Calyx red, ca. 1 cm, tube ca. 2 mm, abaxially stellate pubescent, adaxially glabrous but spotted, lobes lanceolate, ca. 8 × 2–3 mm, stellately spreading, apex long acuminate. Male flowers: androgynophore glabrous. Female flowers: ovary globose, hairy. Style reflexed, shorter than ovary, hairy; stigma short and 5-divided. Follicle pendulous, red, spindle-shaped, ca. 6 × 1–1.5 cm, 3–6-seeded, densely villous abaxially with yellow-brown hairs, tapering apically and basally. Seeds black-brown or black, ellipsoid, ca. 1 cm, glossy. Fl. Apr.

Forests. SE Yunnan (Hekou) [Vietnam].

13. *Sterculia cinnamomifolia* H. T. Tsai & P. I. Mao, Acta Phytotax. Sin. 9: 200. 1964.

樟叶苹婆 zhang ye ping po

Shrubs. Branchlets blackish or black-brown stellate pilose when young. Stipules linear, ca. 2 mm; petiole robust, 1.5–3 cm, apex swollen, hairy; leaf blade elliptic-oblong or ovate-oblong, 11–21 × 7–9.5 cm, thickly papery, abaxially stellate pubescent, adaxially glabrous; lateral veins 6–9 on each side of midrib, veins and midrib adaxially and abaxially prominent, base cuneate, apex shortly acuminate. Inflorescence paniculate, axillary, pendulous, 6–7 cm, yellow-brown stellate pubescent. Epicalyx lobes linear, ca. 3 mm, as long as or slightly longer

than pedicel. Male flowers: calyx yellowish, divided nearly to base, lobes narrowly triangular-lanceolate, ca. 7×2.5 mm wide below middle, abaxially yellow-brown puberulent, adaxially glabrous. Androgynophore curved, glabrous. Anthers 10. Female flowers and fruits unknown. Fl. Mar.

- Open forests; ca. 900 m. SE Yunnan (Hekou).

14. *Sterculia pinbienensis* H. T. Tsai & P. I. Mao, *Acta Phytotax. Sin.* 9: 200. 1964.

屏边苹婆 ping bian ping po

Shrubs. Branchlets at first densely stellate pubescent. Stipules linear-lanceolate, ca. 6 mm; petiole robust, 2–3 cm, densely yellow-brown hairy; leaf blade elliptic or elliptic-oblong, $10\text{--}22 \times 4\text{--}9$ cm, papery, abaxially gray and gray-brown stellate pubescent, adaxially dark green and glabrous, base cuneate or acute, apex shortly acuminate. Inflorescence paniculate, axillary, minutely yellow-brown hairy. Pedicel 6–8 mm. Epicalyx lobes linear, ca. 2.5 cm. Male flowers: calyx red, divided to base, lobes triangular-lanceolate, ca. 12 mm, adaxially nearly glabrous, abaxially stellate pubescent. Male flowers: androgynophore curved, glabrous. Anthers 10. Female flowers: ovary globose, densely yellow-white puberulent. Style reflexed, minutely villous; stigma swollen. Follicle elliptic, $4\text{--}5 \times$ ca. 1.5 cm, densely red-brown puberulent. Seeds black-brown, oblong, ca. 1.1 cm. Fl. Apr.

- Mountain and valley forests; 1000–2000 m. Guangxi (Ningming), Yunnan (Pingbian).

15. *Sterculia scandens* Hemsley, *Bull. Misc. Inform. Kew* 1908: 179. 1908.

河口苹婆 he kou ping po

Shrubs. Branchlets glabrous, grooved. Petiole swollen at both ends, 5–12 cm, glabrous; leaf blade long elliptic-oblong or lanceolate, $15\text{--}45 \times 12\text{--}18$ cm, papery, drying greenish, abaxially and adaxially glabrous, lateral veins 17–20 on each side of midrib, connected submarginally, venation prominently raised on both surfaces, base rounded, apex acuminate or caudate. Inflorescence paniculate, axillary, slender, 10–34 cm, minutely villous. Flowers sparse. Pedicels slender, 5–10 mm. Epicalyx lobes linear, ca. 3 mm, caducous. Calyx divided to near base, both surfaces stellate villous, lobes linear-lanceolate, ca. 20 mm, apex acuminate, incurved and cohering apically with each other. Androgynophore glabrous. Male flowers: androgynophore slender, curved downward. Anthers 10. Female flowers: ovary globose, densely yellow-white tomentose. Style curved. Fruit unknown.

- S Yunnan (Hekou) [Vietnam].

This species is characterized by its large and glabrous leaves and lax flowers. The sepals enlarge after flowering.

16. *Sterculia gengmaensis* H. H. Hsue ex Y. Tang, M. G. Gilbert & Dorr, *nom. nov.*

绿花苹婆 lü hua ping po

Replaced synonym: *Sterculia viridiflora* H. T. Tsai & P. I. Mao, *Acta Phytotax. Sin.* 9: 201. 1964, not *Sterculia viridiflora*

W. Fitzgerald, *J. Proc. Roy. Soc. Western Australia* 3: 177. 1918.

Shrubs. Branchlets gray tomentose when young. Stipules lanceolate, ca. 4 mm; petioles 1.5–3 cm, not swollen at ends, yellow-brown puberulent; leaf blade elliptic or oblanceolate-elliptic, $11\text{--}23 \times 4\text{--}10$ cm, membranous, abaxially and adaxially glabrous, lateral veins 12–14 on each side of midrib, prominent on both surfaces, venation lax, base attenuate and obtuse, apex acute. Inflorescence racemose, nearly terminal, minutely red-brown pilose. Pedicel ca. 6 mm, articulate. Calyx green, divided to near base, both surfaces nearly glabrous or minutely pilose near apex, lobes triangular, ca. 8 mm, apically cohering with each other. Androgynophore tomentose. Fruits unknown.

- Forests; 1600–1700 m. S Yunnan (Gengma).

The earlier intended nomen novum "*Sterculia gengmaensis*" (H. H. Hsue, *Acta Phytotax. Sin.* 15(1): 74. 1977) was not validly published because a full and direct reference to the place of publication of the replaced synonym was not given (*Vienna Code*, Art. 33.4).

17. *Sterculia henryi* Hemsley, *Bull. Misc. Inform. Kew* 1908: 179. 1908.

蒙自苹婆 meng zi ping po

Shrubs or small trees, 1–5 m tall. Branchlets densely yellow-brown pubescent. Petiole 2.5–5 cm; leaf blade oblong or lanceolate-oblong, $14\text{--}25 \times 4\text{--}6$ cm, papery, abaxially and adaxially glabrous, lateral veins ca. 15 on each side of midrib, curved upward, connected with each other near margin, lateral veins and midrib prominently raised abaxially, base rounded, apex acuminate. Inflorescence racemose, axillary, 5–15 cm, yellow-brown hairy. Pedicel 5–10 mm. Epicalyx lobes linear-lanceolate, as long as pedicels. Calyx red, divided to base, lobes narrowly triangular, $10\text{--}15 \times 3\text{--}4$ mm, abaxially yellow-brown stellate hairy, adaxially glabrous, incurved and cohering apically with each other. Male flowers: androgynophore ca. 4 mm, curved downward, glabrous. Female flower: ovary ovoid, densely hairy, 4–6 mm. Style curved, hairy. Fruit unknown.

- Forests; 800–1500 m. S Yunnan (Mengzi) [Vietnam].

The sepals usually enlarge after flowering.

- 1a. Leaf blade base rounded 17a. var. *henryi*
- 1b. Leaf blade base acute or cuneate 17b. var. *cuneata*

17a. *Sterculia henryi* var. *henryi*

蒙自苹婆(原变种) meng zi ping po (yuan bian zhong)

Leaf blade base rounded.

- Forests; ca. 1500 m. S Yunnan (Mengzi) [Vietnam].

17b. *Sterculia henryi* var. *cuneata* Chun & H. H. Hsue, *J. Arnold Arbor.* 28: 329. 1947.

大围山苹婆 da wei shan ping po

Leaf blade base cuneate or acute.

- Dense forests in gullies, sparse forests on slopes; 800–1000 m. SE Yunnan (Pingbian).

18. *Sterculia simaoensis* Y. Y. Qian, Acta Phytotax. Sin. 35: 79. 1997.

思茅苹婆 si mao ping po

Shrubs, 2–4 m. Branchlets grooved, densely stellate pilose and puberulent, glabrescent. Petiole 2.5–5.5 cm, stellate pilose, glabrescent; leaf blade simple, oblanceolate, 11–27 × 3.5–8 cm, papery or rarely thinly leathery, both surfaces stellate pilose, when young, glabrescent, lateral veins 14–16 on each side of midrib, base shallowly cordate, rarely cuneate, apex acuminate. Inflorescence racemose, pendulous, subterminal, 6–15 cm, purple stellate pilose. Pedicel slender, 8–10 mm. Epicalyx lobes lanceolate, 4–5 mm. Calyx purple, divided nearly to base, exterior stellate pilose, interior glabrous, lobes lanceolate, 12–14 × 3.5–4.2 mm, incurved with coherent tips, margin ciliate. Male flowers: androgynophore curved, 3.5–4 mm glabrous. Female flowers: ovary globose, white stellate pilose; style curved, white stellate pilose. Follicle red, drying brownish red, obliquely fusiform, 5–8 × 1.5–2.5 cm, 3–5-seeded, base tapered, apex narrowly acute, stellate pilose and puberulent. Seed purplish black, oblong, 12–15 × 8–10 mm. Fl. and fr. Feb.

- Forests; ca. 1400 m. S Yunnan (Simao).

More detailed study could show that *Sterculia simaoensis* is better included within *S. henryi*. It is differentiated by the subcordate base of the leaf blade, the relatively shorter bracteoles, only ca. 1/2 as long as the pedicels, and by the purplish, not yellow-brown, indumentum of the inflorescence.

19. *Sterculia principis* Gagnepain, Notul. Syst. (Paris) 1: 82. 1909.

基苹婆 ji ping po

Sterculia lanceolata Cavanilles var. *principis* (Gagnepain) Phengklai.

Shrubs. Branchlets at first stellate pubescent. Stipules triangular, 7–10 mm; petiole 4–6 cm, with black-brown spots; leaf blade elliptic or linear-elliptic, 16–28 × 4–8.5 cm, both surfaces glabrous or very sparsely stellate pilose abaxially, basal veins 5, lateral veins 7–10 on each side of midrib, base nearly rounded, apex long acuminate. Inflorescence racemose or few-branched paniculate, axillary, flowers lax. Calyx divided nearly to base, 10–12 mm, abaxially minutely pilose, adaxially glabrous, lobes linear-lanceolate, margins ciliate, apex long acuminate, incurved and cohering apically with each other. Male flowers: androgynophore glabrous, curved. Female flowers: androgynophore very short, hairy. Style minutely hairy; stigma 5-lobed. Fruit not seen. Fl. Mar.

Forests on slopes; 1600–1700 m. SE Yunnan (Jinping) [Laos, Myanmar, Thailand].

20. *Sterculia brevissima* H. H. Hsue ex Y. Tang, M. G. Gilbert & Dorr, **nom. nov.**

短柄苹婆 duan bing ping po

Replaced synonym: *Sterculia brevipetiolata* H. T. Tsai & P. I. Mao, Acta Phytotax. Sin. 9: 201. 1964, not *Sterculia brevipetiolata* Merrill, Publ. Bur. Sci. Gov. Lab. 35: 40. 1906.

Small trees or shrubs. Branchlets yellow-brown villous when very young. Leaves apically clustered. Stipules lanceo-

late, ca. 7 mm; petiole short, almost absent or 5–12 mm, gray pubescent; leaf blade oblanceolate or narrowly oblanceolate-elliptic, 15–30 × 4–7 cm, papery, both surfaces glabrous, lateral veins 14–16 on each side of midrib, base attenuate, apex acuminate or obtusely acute. Inflorescence slender, racemose or paniculate, axillary, pendulous. Epicalyx lobes linear-lanceolate, ca. 7 mm, as long as pedicels. Calyx pink, purple below middle, sparsely stellate villous, tube campanulate, lobes elliptic-lanceolate, ca. 8 × 3 mm, ca. 3 × as long as calyx tube. Androgynophore slender, curved, ca. 4.5 mm. Ovary globose, densely tomentose; style reflexed. Fruit stipe ca. 3 cm; follicle red-brown, ellipsoid, ca. 8 × 2 cm, abaxially densely puberulent, both ends attenuate. Seeds brown, globose, ca. 1 cm in diam. Fl. Apr.

- Gullies or slopes in mixed forests or rain forests; 500–1300 m. S Yunnan.

The sessile, oblanceolate leaf blades of *Sterculia brevissima*, clustered at the tips of the branchlets, are very distinct from those of other species.

The earlier intended nomen novum "*Sterculia brevissima*" (H. H. Hsue, Acta Phytotax. Sin. 15(1): 74. 1977) was not validly published because a full and direct reference to the place of publication of the replaced synonym was not given (*Vienna Code*, Art. 33.4).

21. *Sterculia subnobilis* H. H. Hsue, Acta Phytotax. Sin. 15(1): 82. 1977.

罗浮苹婆 luo fu ping po

Trees. Branchlets minutely pubescent. Petiole 2–5 cm, nearly glabrous; leaf blade elliptic, 17–28 × 8–13 cm, both surfaces glabrous, or abaxially sparsely pubescent when young, basal veins 5, lateral veins 6–9 on each side of midrib, base nearly rounded or ± cordate, apex obtusely acute. Inflorescence paniculate, axillary, lax, 10–18 cm, minutely hairy. Pedicels slender, ca. 1 cm. Calyx green at first, becoming red later, up to 18 mm in diam., divided nearly to base, both surfaces sparsely puberulent, lobes linear-lanceolate, ca. 8 mm, spreading outward, margins ciliate, apex long acuminate. Male flowers: androgynophore glabrous. Anthers ca. 15. Female flowers: ovary shortly stipitate, globose, tomentose with yellow-brown hairs. Style curved downward, hairy. Fruit not seen. Fl. Apr.

- Slopes; 1000–1100 m. S Guangdong, Guangxi (Fusui).

This species is similar to *Sterculia monosperma*.

22. *Sterculia lanceolata* Cavanilles, Diss. 5: 287. 1788.

假苹婆 jia ping po

?*Helicteres undulata* Loureiro; *Sterculia balansae* Aug. Candolle.

Trees. Branchlets at first pilose. Petiole 2.5–3.5 cm; leaf blade elliptic, lanceolate, or elliptic-lanceolate, 9–20 × 3.5–8 cm, abaxially nearly glabrous, adaxially glabrous, lateral veins 7–9 on each side of midrib, curved upward, connected near margin, base obtuse or nearly rounded, apex acute. Inflorescence paniculate, 4–10 cm, densely many-branched. Calyx reddish, divided almost to base, pubescent abaxially, lobes oblong-lanceolate or oblong-elliptic, 4–6 mm, stellately spreading, margins ciliate, apex obtuse or minutely mucronate. Male flowers: androgynophore 2–3 mm, curved. Anthers ca. 10. Female flow-

ers: ovary globose, hairy. Style curved; stigma minutely 5-lobed. Follicle fresh red, narrowly ovoid or ellipsoid, 5–7 × 2–2.5 cm, 2–4-seeded, densely puberulent, base attenuate, apex beaked. Seeds black-brown, ellipsoid-ovoid, ca. 1 cm. Fl. Apr–Jun.

Usually near streams. Guangdong, Guangxi, Guizhou, S Sichuan, Yunnan [Laos, Myanmar, Thailand, Vietnam].

This species is the most widely distributed member of the genus in the Flora area. The bark fiber is used for making bags or paper.

23. *Sterculia lanceifolia* Roxburgh, Fl. Ind., ed. 1832, 3: 150. 1832 [*“lanceaefolia”*].

西蜀苹婆 xi shu ping po

Sterculia roxburghii Wallich.

Trees or shrubs; bark gray. Branchlets puberulent. Stipules subulate, minutely hairy, caducous; petiole 2.5–3.5 cm, both ends pulvinate; leaf blade lanceolate, linear-lanceolate, or oblong-lanceolate, 10–23 × 2.5–7.5 cm, minutely pilose, becoming glabrous, lateral veins 9–10 on each side of midrib, slightly connected near margin, base rounded or obtuse, apex obtusely acuminate. Inflorescence racemose, or rarely paniculate, axillary, 5–7 cm, much shorter than leaves, laxly few-flowered, stellate pilose. Pedicel slender, 5–8 mm. Calyx red, campanulate, divided nearly to base, ca. 7 mm, abaxially sparsely puberulent, lobes oblong-lanceolate, ca. 5 mm, much longer than calyx tube, spreading outward. Male flowers: androgynophore curved, glabrous. Female flowers: ovary globose, densely puberulent. Follicle oblong or oblong-lanceolate, ca. 7 cm, 4–8-seeded, abaxially densely red hirsute, apex beaked. Seeds black, ovoid.

Forested slopes; 800–2000 m. Guizhou, S Sichuan, S Yunnan [Bangladesh, NE India].

The name *Sterculia lanceifolia* was first published as a nomen nudum in 1814 (Roxburgh, Hort. Bengal. 50. 1814) and is sometimes indicated as having been validated by G. Don (Gen. Hist. 1: 517. 1831, *“lanceaefolia”*) but Don only listed the name at the end of the account of *Sterculia*, under “Species the names of which are only known,” stating “Tree 30 feet.” Some would regard this as a validating description.

24. *Sterculia hainanensis* Merrill & Chun, Sunyatsenia 2: 281. 1935.

海南苹婆 hai nan ping po

Small trees or shrubs. Branchlets glabrous or minutely stellate puberulent when young. Petiole 1.5–2.5 cm; leaf blade oblong or linear-lanceolate, 15–23 × 2.5–6 cm, abaxially and adaxially glabrous, lateral veins 13–18 on each side of midrib,

curved and connected far from margin, base acute or obtuse, apex obtuse or nearly acuminate. Inflorescence racemose, terminal. Male flowers: calyx red, ca. 8 mm, divided nearly to base, abaxially sparsely stellate pilose, lobes oblong or oblong-elliptic, ca. 6 mm. Androgynophore curved. Anthers ca. 8 in circle. Female flowers slightly larger, ca. 10 mm. Ovary globose; style curved. Follicle red, narrowly ellipsoid, ca. 4 cm, abaxially densely velutinous, apical beak ca. 6 mm. Seeds black-brown, ellipsoid, ca. 1 cm. Fl. Jan–Apr.

• Valleys and gullies in dense forests. S Guangxi, E Hainan.

25. *Sterculia yuanjiangensis* H. H. Hsue & S. J. Xu, J. S. China Agric. Univ. 8(3): 3. 1987.

元江苹婆 yuan jiang ping po

Trees, to 9 m tall. Branchlets drying purple-red, nearly glabrous. Stipules caducous; petiole 3.5–5 cm, glabrous or sparsely stellate pilose; leaf blade obovate or narrowly obovate, 13–26 × 7–10 cm, thinly leathery, glabrous, lateral veins 5–9 on each side of midrib, ascending and curved, abaxially prominently raised, adaxially apparent, base tapering or cuneate, apex rounded or minutely acute. Flowers unknown. Follicle drying brown, ellipsoid, ca. 6 × 3 cm, 4-seeded, abaxially densely brown stellate pilose, base narrowed, apex beaked. Seeds black, subglobose, 1.5–2 cm.

• Yunnan (Yuanjiang).

26. *Sterculia guangxiensis* S. J. Xu & P. T. Li, Acta Phytotax. Sin. 38: 568. 2000.

广西苹婆 guang xi ping po

Trees, to 7 m tall. Branchlets sparsely pubescent when young. Petiole 1–1.5 cm, base and apex pulvinate, sparsely pubescent; leaf blade simple, obovate or elliptic-obovate, 10–18 × 4.5–6 cm, thinly leathery, abaxially subglabrous, adaxially glabrous, lateral veins 9–11 on each side of midrib, curved upward, ± connected near margin, base cuneate, apex acute or acuminate. Inflorescence and flowers not seen. Follicle scarlet, cylindrical-ellipsoid, 3.5–6 × 1.5–2 cm, 3-seeded, base rounded, apex beaked, densely yellow pubescent and stellate pilose. Seeds blackish, ellipsoid, 10–12 × ca. 8 mm, glossy. Fr. Jun.

• Guangxi.

Sterculia guangxiensis was compared in the protologue to *S. lanceolata* Cavanilles, but the petiole of the former is distinctly pulvinate at both ends, suggesting a closer relationship to *S. lanceifolia*, which differs by the longer (2.5–3.5 cm) petiole and rounded, not cuneate, base of the leaf blade.

3. FIRMIANA Marsili in Saggi Sci. Lett. Accad. Padova 1: 114, 116. 1786.

梧桐属 wu tong shu

Erythropsis Lindley ex Schott & Endlicher; *Karaka* Rafinesque.

Trees or shrubs, deciduous. Leaves simple, palmately 3–5-lobed or entire. Inflorescence paniculate or rarely racemose, axillary or terminal. Flowers unisexual or polygamous, sometimes appearing before leaves. Calyx orange-red or golden, funnel-shaped or cylindrical, (4 or)5-lobed or -partite, lobes short or divided nearly to base, reflexed. Petals absent. Male flowers: stamens 10–20, in capitate cluster at apex of androgynophore; anther 2-celled, anther cells curved; undeveloped pistil present. Female flowers: ovary 5-locular, ovoid or globose, basally enclosed by undeveloped anthers; styles basally connate; stigmas as many as carpels; ovules 2 to many per locule. Follicles stipitate, endocarp membranous, dehiscent long before maturity, foliaceous. Seeds 1 to many per follicle,

on inner margin of foliaceous endocarp, globose, endosperm flat or plicate; cotyledons flat, very thin.

About 16 species: tropical, subtropical, and temperate Asia; seven species (five endemic) in China.

The relationship between *Firmiana* and *Hildegardia* Schott & Endlicher is unresolved. Kostermans (Reinwardtia 4: 281–310. 1957) used a follicle character, dehiscence vs. indehiscence, to separate the two genera. Molecular data, based on limited sampling, support a division based on floral characters, especially relating to calyx morphology, but there are unpublished molecular data that suggest that *Firmiana* and *Hildegardia* may not be distinct. *Firmiana* is the older of the two names.

- 1a. Flowering when leafless; calyx lobes much shorter than tube.
 - 2a. Base of leaf blade deeply cordate, apex obtuse; calyx funnel-shaped, base nearly cuneate 5. *F. colorata*
 - 2b. Base of leaf blade truncate or shallowly cordate, apex acuminate; calyx subcampanulate or cylindrical, base ± rounded.
 - 3a. Lobes of leaf blade 9–14 cm, apex long acuminate; calyx subcampanulate, ca. 16 mm, densely stellate pubescent with rust-colored hairs 6. *F. pulcherrima*
 - 3b. Lobes of leaf blade 2–3 cm, apex acute to shortly acuminate; calyx cylindrical, ca. 32 mm, densely stellate tomentose with golden and reddish brown hairs 7. *F. kwangsiensis*
- 1b. Flowering with leaves present; calyx divided almost to base, lobes much longer than tube, reflexed.
 - 4a. Leaf blade abaxially glabrous or slightly pilose; inflorescence terminal.
 - 5a. Leaf blade cordate, 3–5-lobed, 15–30 cm wide; bark greenish; flowers yellowish green or yellow-white 1. *F. simplex*
 - 5b. Leaf blade suborbicular, entire, 8–10 cm wide; bark blackish brown; flowers purple 4. *F. danxiaensis*
 - 4b. Leaf blade abaxially densely hairy; inflorescence terminal or axillary.
 - 6a. Leaf blade 3-lobed, 17–30 × 19–40 cm, base cordate, petiole 15–45 cm 3. *F. major*
 - 6b. Leaf blade entire, 7–14 × 5–12 cm, base truncate or slightly cordate, petiole 4–16 cm 2. *F. hainanensis*

1. *Firmiana simplex* (Linnaeus) W. Wight, U. S. D. A. Bur. Pl. Industr. Bull. 142: 67. 1909.

梧桐 wu tong

Hibiscus simplex Linnaeus, Sp. Pl., ed. 2, 2: 977. 1763; *Firmiana platanifolia* (Linnaeus f.) Schott & Endlicher; *F. simplex* var. *glabra* Hatusima; *Sterculia firmiana* J. F. Gmelin; *S. platanifolia* Linnaeus f.; *S. pyriformis* Bunge; *S. simplex* (Linnaeus) Druce.

Deciduous trees, up to 16 m tall; bark greenish, smooth. Petiole 15–30 cm; leaf blade cordate, palmately 3–5-lobed, 15–30 cm in diam., lobes triangular, both surfaces glabrous or minutely puberulent, basal veins 7, base cordate, apex acuminate. Inflorescence paniculate, terminal, 20–50 cm. Calyx yellowish green, 7–9 mm, divided nearly to base, lobes linear, twisted outward, abaxially puberulent and yellowish, adaxially villous only basally; pedicel nearly as long as calyx. Male flower: androgynophore as long as calyx, thicker in lower part, glabrous. Anthers 15, irregularly fascicled, pistillode pear-shaped and very small. Female flower: ovary globose, hairy. Follicle membranous, stalked, foliaceous, 6–11 × 1.5–2.5 cm, 2–4-seeded, abaxially puberulent or nearly glabrous. Seeds globose, ca. 7 mm in diam., wrinkled. Fl. Jun. $2n = 40^*$.

Widely cultivated. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Shanxi, Sichuan, Taiwan, Yunnan, Zhejiang [Japan; cultivated in Europe and North America (United States)].

2. *Firmiana hainanensis* Kostermans, Pengum. Balai Besar Penjel. Kehut. Indonesia 54: 30. 1956.

海南梧桐 hai nan wu tong

Trees, up to 16 m tall, 45 cm d.b.h.; bark gray. Branches smooth. Petiole 4–16 cm, yellowish stellate pilose; leaf blade ovate, 7–14 × 5–12 cm, abaxially gray-white, densely stellate pubescent, adaxially glabrous, basal veins 5, lateral veins 4–5 on each side of midrib, base truncate or subcordate, apex obtuse

or acute. Inflorescence paniculate, terminal or axillary, to 20 cm, densely yellowish brown stellate pubescent. Calyx yellowish white, ca. 9 mm, divided nearly to base, abaxially densely yellowish-brown stellate pubescent, adaxially basally woolly, lobes linear-lanceolate, ca. 1.5 mm wide. Male flower: androgynophore as long as calyx, apex 5-lobed. Anthers 15, in capitate fascicle. Female flower: ovary ovoid, ca. 2.5 mm, longitudinally 5-grooved, densely stellate hairy. Follicle ovoid, ca. 7 × 3 cm, 3–5-seeded, abaxially minutely hairy with simple hairs and stellate pubescence, apex acute or emarginate. Seeds yellow-brown when mature, ellipsoid, ca. 6 mm. Fl. Apr.

• Sandy soils. C and W Hainan.

3. *Firmiana major* (W. W. Smith) Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 60: 96. 1924 [*"Firmiana maior"*].

云南梧桐 yun nan wu tong

Sterculia platanifolia Linnaeus f. var. *major* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 9: 130. 1916; *Hildegardia major* (W. W. Smith) Kostermans.

Deciduous trees, up to 15 m tall; trunk erect; bark greenish gray-black, rough. Branchlets robust, puberulent. Petiole robust, 15–45 cm, puberulent at first, glabrescent; leaf blade palmately 3-lobed, 17–30 × 19–40 cm, usually wider than long, abaxially densely yellow-brown puberulent, glabrescent, adaxially glabrous, basal veins 5–7, base cordate, apex acute or acuminate. Inflorescence paniculate, terminal or axillary. Calyx purple-red, ca. 12 mm, hairy, divided nearly to base, lobes linear or oblong-linear. Male flowers: androgynophore long, tube-shaped. Female flowers: ovary long stalked, abaxially velutinous; ovules many; staminodes present. Follicle membranous, ca. 7 × 4.5 cm, nearly glabrous. Seeds yellow-brown, globose, ca. 8 mm, wrinkled. Fl. Jun–Jul, fr. Oct.

• Slopes; 1600–3000 m. SW Sichuan, C, S, and W Yunnan.

The synonym *Hildegardia major* was the source of the report in Bayer and Kubitzki (Fam. Gen. Vasc. Pl. 5: 265. 2003) that the genus *Hildegardia* Schott & Endlicher occurs in China.

4. *Firmiana danxiaensis* H. H. Hsue & H. S. Kiu, J. S. China Agric. Univ. 8(3): 2. 1987.

丹霞梧桐 dan xia wu tong

Trees, 3–8 m tall; bark black-brown. Branchlets terete, greenish, glabrous. Petiole 4.5–8.5 cm, glabrous; leaf blade suborbicular, 8–10 × 8–10 cm, thinly leathery, glabrous, basal veins 7, prominently raised abaxially and apparent adaxially, base cordate, margin entire or 3-lobed at apex, apex shortly acute. Inflorescence paniculate, up to 20 cm, many-flowered, densely yellow stellate tomentose. Calyx purple, divided nearly to base, abaxially densely yellowish pilose, adaxially white villous at base, lobes linear, ca. 10 × 1–1.2 mm. Stamens 15. Ovary subglobose, 5-celled, ca. 4 mm, 5-grooved, densely stellate tomentose. Follicle oblanceolate, 8–10 × 2.5–3 cm, 2- or 3-seeded, subglabrous. Seeds yellowish brown, globose, ca. 6 mm in diam.

• Limestone forests; 200–300 m. Guangdong.

5. *Firmiana colorata* (Roxburgh) R. Brown, *Pterocymbium*, 235. Jun 1844.

火桐 huo tong

Sterculia colorata Roxburgh, Pl. Coromandel 1: 26. 1795; *Erythropsis colorata* (Roxburgh) Burkill; *E. roxburghiana* Schott & Endlicher, nom. illeg. superfl.; *Karaka colorata* (Roxburgh) Rafinesque.

Deciduous trees, up to 15 m tall. Branchlets gray-black when desiccate, minutely gray puberulent. Petiole 10–15 cm; leaf blade broadly cordate, 17.5–25 × 18–20 cm, thinly leathery, both surfaces sparsely yellowish stellate puberulent, basal veins 5–7, veinlets prominently raised on both surfaces, nearly parallel, base deeply cordate, apex 3–5-lobed, middle lobe ca. 5 cm, apex obtuse, lateral lobes ca. 3 cm. Inflorescence cymose-paniculate, up to 7 cm, densely orange-red stellate puberulent. Pedicels 4–5 mm, puberulent. Calyx funnel-shaped, base nearly cuneate, ca. 20 × 7–8 mm, apex 5-lobed, abaxially densely stellate puberulent with orange hairs, adaxially densely puberulent, lobes ovate-triangular, ca. 4 mm, apex acute. Male flower: androgynophore 10–12 mm, stellate puberulent. Female flower: ovary 5-locular, nearly separated, glabrous. Style short; stigma curved outward. Follicle stalked, red or purple when mature, foliaceous, tongue-shaped, 5–7 cm, 2–4-seeded, with apparent venation. Seeds black, globose, ca. 6 mm in diam. Fl. Mar–Apr.

Forested slopes; 700–1000 m. S Yunnan [Bhutan, India (including

Andaman Islands), Indonesia (Sumatra), Malaysia, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam].

The place of publication of *Firmiana colorata* is often given as R. Brown in Bennett, Pl. Jav. Rar. 235. 1844, which was published in November 1844 and was thus predated by Brown's preprint published in June of the same year.

6. *Firmiana pulcherrima* H. H. Hsue, Acta Phytotax. Sin. 8: 271. 1963.

美丽火桐 mei li huo tong

Erythropsis pulcherrima (H. H. Hsue) H. H. Hsue.

Deciduous trees, up to 18 m tall; bark gray-white or brown-black. Branchlets purple when desiccate, glabrate. Leaves heteromorphic; petiole 6–17 cm, glabrate; leaf blade 3–5-palmate or entire, 7–23 × 7–9 cm, middle lobe up to 14 cm, lateral lobes to 9 cm, papery, stellate puberulent at base of midrib only, basal veins 5, prominent on both surfaces, base truncate or subcordate, apex caudate. Inflorescence cymose, paniculate, 8–14 cm, densely brown-red stellate hairy. Pedicel 3–4 mm. Calyx nearly campanulate, ca. 16 × 8 mm, apically 5-lobed, abaxially densely brownish red stellate hairy, adaxially villous around base, lobes triangular, ca. 3 mm. Male flower: androgynophore ca. 24 mm, stellate hairy. Anthers 15–25, in capitate cluster, enclosing 5 sterile, nearly free, carpels. Female flower and fruit unknown. Fl. Apr–May.

• Forests, stream valleys. E Hainan.

7. *Firmiana kwangsiensis* H. H. Hsue, Acta Phytotax. Sin. 15(1): 81. 1977.

广西火桐 guang xi huo tong

Erythropsis kwangsiensis (H. H. Hsue) H. H. Hsue.

Deciduous trees, up to 10 m tall; bark gray, not flaking. Branchlets gray-brown, nearly glabrous; young buds densely yellow-brown stellate puberulent. Petiole to 20 cm, minutely yellowish brown stellate hairy; leaf blade broadly ovate or nearly round, 10–17 × 9–17 cm, entire or apically 3-lobed, papery, both surfaces sparsely puberulent, densely hairy in axils of veins, basal veins 5–7, veinlets prominent on both sides, nearly parallel, base truncate or nearly cordate, lobes acuminate or acute, 2–3 cm. Inflorescence cymose-racemose, 5–7 cm. Pedicels 4–8 mm, golden to red-brown stellate hairy. Calyx cylindrical, ca. 32 × 11 mm, apically 5-lobed, abaxially golden to red-brown stellate hairy, adaxially bright red stellate pilose, lobes triangular-ovate, ca. 4 mm. Male flowers: androgynophore ca. 28 mm. Anthers 15, in capitate cluster. Fruit unknown. Fl. Jun.

• Scrub-covered slopes; 900–1000 m. Guangxi (Jinxi).

4. *HERITIERA* Aiton, Hort. Kew. 3: 546. 1789.

银叶树属 yin ye shu shu

Sutherlandia J. F. Gmelin (1792), not R. Brown (1812), nom. cons.

Trees, usually with buttress. Leaves alternate, simple or palmately compound, abaxially usually scaly. Inflorescence cymose, paniculate, axillary, many-flowered, hairy or scaly. Flowers unisexual. Calyx campanulate or urceolate, 4–6-lobed. Petals absent. Male flowers: androgynophore short. Anthers 4–15, in 1 or 2 rings at apex of androgynophore, with pistillode. Female flowers: ovary with 3–5 coherent carpels, base with sterile anthers; ovules 1 per carpel. Style very short; stigma very small. Fruit woody or leathery, with keel-like prominence or wing, indehiscent. Seeds without endosperm.

About 35 species: tropical Africa, Asia, and Australasia; three species in China.

- 1a. Fruit leathery, apex with long fishtail-shaped wing, wing 2–4 cm; calyx white 1. *H. parvifolia*
 1b. Fruit woody, with keel-like prominence or short ca. 1 cm wing; calyx red or red-brown.
 2a. Fruit with keel-like prominence; anthers 4 or 5 in 1 ring; petiole less than 2 cm 2. *H. littoralis*
 2b. Fruit with short ca. 1 cm wing; anthers 8–12 in 2 rings; petiole 2–9 cm 3. *H. angustata*

1. *Heritiera parvifolia* Merrill, J. Arnold Arbor. 6: 137. 1925.

蝴蝶树 hu die shu

Tarrietia parvifolia (Merrill) Merrill & Chun.

Evergreen trees, up to 30 m tall; bark gray. Branchlets densely scaly. Petiole 1–1.5 cm; leaf blade elliptic-lanceolate, 6–8 × 1.5–3 cm, abaxially densely silver-white or brown scurfy scaly, adaxially glabrous, lateral veins 6 on each side of midrib, base acute or nearly rounded, apex acuminate. Inflorescence paniculate, densely ferruginous stellate pilose. Calyx white, ca. 4 mm, 5–6-lobed, both surfaces stellate puberulent, lobes oblong-ovate, 1.5–2 mm. Male flower: androgynophore ca. 1 mm, base surrounded by thick disk, ca. 0.8 mm in diam. Anthers 8–10, in 1 ring. Female flowers: ovary ca. 2 mm, hairy. Fruit 4–6 cm, seed-bearing portion 1–2 cm, apical wing fishtail-shaped, ca. 2 cm wide, apex obtuse, densely scurfy scaly; endocarp leathery. Seeds ellipsoid. Fl. May–Jun.

Montane forests. S Hainan [India, Myanmar, Thailand].

Heritiera parvifolia is an important timber tree.

2. *Heritiera littoralis* Aiton, Hort. Kew. 3: 546. 1789.

银叶树 yin ye shu

Evergreen trees, up to 10(–15) m tall; bark gray-brown. Young branchlets white scurfy scaly. Stipules lanceolate, caducous; petiole 1–2 cm; leaf blade oblong-lanceolate, elliptic, or ovate, 10–20 × 5–10 cm, leathery, abaxially densely silver-white scurfy scaly, adaxially glabrous or nearly so, base obtuse, apex acute or obtuse. Inflorescence paniculate, axillary, ca. 8 cm, densely stellate hairy or with scales. Calyx red-brown, campanulate, 4–6 mm, both surfaces stellate hairy, lobes triangular,

ca. 2 mm. Male flowers: disk thin, papillate. Androgynophore short and glabrous. Anthers 4 or 5, in 1 ring. Female flowers: carpels 4 or 5. Stigmas as many as carpels, short and curved downward. Fruit nutlike, woody, drying yellow-brown, nearly ellipsoid, ca. 6 × 3.5 cm, keeled on back, glabrous. Seeds ovoid, ca. 2 cm. Fl. summer.

Mangrove forests. Guangdong, Guangxi, Hainan, Taiwan [Cambodia, India, Indonesia, Malaysia, Philippines, Sri Lanka, Vietnam; E Africa, Australia].

The hard, strong timber is used for ships' masts when sufficiently straight and long, as well as for house posts, joists, wheel hubs, and boat ribs.

3. *Heritiera angustata* Pierre, Fl. Forest. Cochinch. t. 204c. 1889.

长柄银叶树 chang bing yin ye shu

Evergreen trees, up to 12 m tall; bark gray. Young branchlets pilose. Stipules linear-lanceolate, 2–9 cm, deciduous; leaf blade oblong-lanceolate, 10–30 × 5–15 cm, abaxially with silvery white or slightly golden scales, adaxially glabrous, base acute or subcordate, apex acuminate or obtuse. Inflorescence paniculate, terminal or axillary. Calyx red, urceolate, ca. 6 × 2.5–4 mm, 4–6-lobed, both surfaces stellate hairy, lobes triangular. Male flowers: androgynophore 2–3 mm. Anthers 8–12, in 2 rings. Female flowers shorter than male flowers; staminodes 4–10 around base of ovary. Ovary globose, slightly 5-angular, puberulent; style short; stigma 5-lobed. Fruit drupelike, brown, hard, ellipsoid, ca. 3.5 cm, apex with ca. 1 cm wing. Seeds ovoid. Fl. Jun–Nov.

Mountains, near coasts. SE Hainan, Yunnan [Cambodia].

5. REEVESIA Lindley, Quart. J. Sci. Lit. Arts, ser. 2, 2: 112. 1827.

梭罗树属 suo luo shu shu

Veeresia Monachino & Moldenke.

Trees or rarely shrubs. Leaves simple, petiolate, pulvinate or not, usually entire, glabrous to densely pubescent with stellate hairs. Inflorescences paniculate, cymose or thyrsoid, many-flowered, bracteate. Flowers bisexual, pedicellate, pedicel articulate. Calyx campanulate or obconical, irregularly 3–5-lobed. Corolla rotate; petals (4 or)5, clawed, auriculate or not, white, yellow, or pink. Stamens 15 in 5 groups of 3; filaments fused to ovary stipe to form androgynophore, upper part widening to enclose ovary; anthers sessile, usually in very congested head, 2-celled; staminodes 5, toothlike, minute. Ovary 5-locular, 5-lobed; ovules 2 per locule, ascending; stigma sessile, 5-lobed. Capsule woody, loculicidally and septically dehiscent into 10 separate valves. Seeds (1 or)2 per locule, superposed, winged, wing developing abaxially, membranous; endosperm reduced; cotyledons ± flat.

About 25 species: mostly in S Asia, two species in Central America (Mexico and Nicaragua); 15 species (12 endemic) in China.

Reevesia esquirolii H. Léveillé (Repert. Spec. Nov. Regni Veg. 13: 175. 1914) is a synonym of *Rhododendron cavaleriei* H. Léveillé in the Ericaceae (see Fl. China 14: 428. 2005).

- 1a. Leaf blade abaxially pubescent to tomentose.
 2a. Leaf blade orbicular, rarely ovate or obovate, almost as long as wide, to 15 cm in diam., basal veins 5.
 3a. Leaf blade margin entire; fruit stipe nearly glabrous 9. *R. orbicularifolia*
 3b. Leaf blade margin with 2 or 3 teeth near apex; fruit stipe hairy 10. *R. rotundifolia*
 2b. Leaf blade not orbicular, longer than wide, basal veins 3–5.

- 4a. Leaf blade abaxially densely gray stellate puberulent and usually glaucous; sepals ca. 3 mm; capsule ca. 1.5 cm 11. *R. glaucophylla*
- 4b. Leaf blade abaxially not glaucous, yellowish brown to brown stellate pubescent; sepals 6–9 mm; capsule 2.5–5 cm (flowers not known in *R. lumlingensis*).
- 5a. Capsule densely brown stellate puberulent; leaf blade abaxially densely yellow-brown puberulent 12. *R. tomentosa*
- 5b. Capsule yellow-brown pilose or brown pubescent; leaf blade abaxially yellowish brown hairy.
- 6a. Branchlets densely red-brown stellate tomentose; leaf blade midrib and lateral veins with reddish brown hairs; capsule widest ca. at middle, apex obtuse 13. *R. rubronervia*
- 6b. Branchlets brown or yellowish brown pubescent or puberulent when young; leaf blade midrib and lateral veins with brown or yellowish brown hairs; capsule widest above middle, apex truncate.
- 7a. Capsule 2.5–3.5(–5) cm; leaf blade 7–19 cm 14. *R. pubescens*
- 7b. Capsule 4.5–5 cm; leaf blade 13–18 cm 15. *R. lumlingensis*
- 1b. Leaf blade abaxially glabrous or pubescent only when very young.
- 8a. Young branchlets densely yellowish stellate puberulent, yellowish white when dry.
- 9a. Leaf blade 10–15 × 3.5–5.5 cm, base unequally cuneate; capsule ca. 4 cm 2. *R. lofouensis*
- 9b. Leaf blade 2.5–10 × 0.8–4 cm, base rounded, shallowly cordate or shortly cuneate; capsule ca. 3 cm 3. *R. formosana*
- 8b. Young branchlets glabrous or very sparsely pilose, gray or purple-black or blackish brown when dry.
- 10a. Petiole 5–6.5 cm; leaf blade 4–8(–10) cm wide 14. *R. pubescens*
- 10b. Petiole 1–3.5 cm; leaf blade 1.5–6 cm wide.
- 11a. Leaf blade oblanceolate, to 20 cm, apex obtuse or rounded 1. *R. botingensis*
- 11b. Leaf blade elliptic, ovate-elliptic, or lanceolate, less than 15 cm, apex acute or acuminate, less than 15 cm.
- 12a. Petals thick, sparsely pilose; inflorescences to 12 cm 4. *R. shangszeensis*
- 12b. Petals thin, glabrous; inflorescences to 10 cm.
- 13a. Calyx 8–9 mm; leaf blade 3–6 cm wide, lateral veins 8–12 on each side of midrib; capsule 4–4.5 cm 8. *R. longipetiolata*
- 13b. Calyx 3–6 mm; leaf blade 1.5–3 cm wide, lateral veins 5–7 on each side of midrib; capsule 1.5–4 cm.
- 14a. Leaf blade lanceolate or oblong-lanceolate, base acute; capsule with white scurfy scales; androgynophore ca. 2.5 cm 5. *R. lancifolia*
- 14b. Leaf blade elliptic, ovate-elliptic, or elliptic-lanceolate, base rounded or obtuse, rarely subcordate; capsule with yellow to brown stellate hairs; androgynophore 1–2 cm.
- 15a. Sepals ca. 3 mm; petals yellowish; leaf blade thinly papery; capsule 1.5–2 cm 6. *R. pycnantha*
- 15b. Sepals ca. 6 mm; petals white; leaf blade leathery; capsule ca. 3 cm 7. *R. thyrsoides*

1. *Reevesia botingensis* H. H. Hsue, Acta Phytotax. Sin. 8: 272. 1963.

保亭梭罗 bao ting suo luo

Trees, to 10 m tall. Branchlets robust, gray, nearly glabrous. Petiole 1.5–3 cm, glabrous; leaf blade oblanceolate, 7–20 × 2–6 cm, leathery, both surfaces glabrous, lateral veins 7–9 on each side of midrib, slightly prominent abaxially, base cuneate, apex obtuse or rounded. Flowers not seen. Capsule oblong pyriform, 5-grooved (angular), ca. 3 × 2.8 cm, densely pale yellow stellate puberulent, apex truncate. Seeds 2–3.5 cm including wing, wing brown, oblong, ca. 2 cm, apex obtuse. Fr. Dec.

• Dense montane forests. Hainan (Baoting).

2. *Reevesia lofouensis* Chun & H. H. Hsue, J. Arnold Arbor. 28: 329. 1947.

罗浮梭罗 luo fu suo luo

Trees, to 13 m tall. Branchlets yellowish white when dried, densely yellowish stellate puberulent. Petiole 1–3.5 cm,

slightly swollen at both ends, stellate tomentose, glabrescent; leaf blade oblong-ovate, 10–15 × 3.5–5.5 cm, leathery, both surfaces glabrous, lateral veins 6–8 on each side of midrib, base unequally cuneate, apex acuminate. Inflorescence paniculate, ca. 4 cm, densely flowered, yellowish brown stellate puberulent. Mature flowers unknown; bud globose. Capsule oblong-pyriform, rugose. Seeds 2.5–3.2 cm including wing, wing brown, oblong-obtuse, ca. 2 × 1 cm, apex obtuse. Fl. May–Jun, Dec, fr. Jan, Jun–Aug, Nov–Dec.

• Open forests. Guangdong (Luofu Shan), Hainan.

3. *Reevesia formosana* Sprague, Bull. Misc. Inform. Kew 1914: 325. 1914.

台湾梭罗 tai wan suo luo

Reevesia formosana Hayata (1920), not Sprague (1914); *R. taiwanensis* Chun & H. H. Hsue.

Trees, medium-sized, deciduous. Branchlets whitish yellow when dried, densely yellowish stellate puberulent when

young, glabrescent. Petiole 0.7–3 cm, apex swollen; leaf blade oblong or ovate-oblong, 2.5–10 × 0.8–4 cm, thinly leathery, both surfaces stellate hairy, glabrescent, base rounded, shallowly cordate or shortly cuneate, apex bluntly slightly acuminate. Inflorescence paniculate, 3–5 cm, densely flowered, very densely yellowish brown puberulent. Pedicels 2–3[ca. 8] mm. Calyx campanulate, ca. 5 mm, abaxially puberulent, adaxially glabrous, irregularly (4 or)5-lobed, lobes broadly ovate, ca. 1 mm. Petals 5, yellowish white, broadly spatulate, 7–10 × ca. 3 mm. Androgynophore 1.3–1.7 cm; anther head ca. 2 mm in diam. Ovary densely stellate pubescent along ridges. Fruiting stipe ca. 2 cm; capsule obovoid or obovoid globose, 5-grooved, 2.5–3.5 × ca. 2 cm, puberulent. Seeds 1 or 2 per locule, obovate, 1.8–2 cm including wing, wing brown, ca. 0.6 cm, apex slightly curved and acute. Fl. Apr–May, fr. Mar, May, Jul–Sep, Dec.

- S Taiwan (Gaoxiong).

4. *Reevesia shangszeensis* H. H. Hsue, Acta Phytotax. Sin. 8: 274. 1963.

上思梭罗 shang si suo luo

Trees, to 7 m tall. Branchlets robust, sparingly puberulent. Petiole 1.5–3(–3.4) cm, nearly glabrous, ends not swollen; leaf blade elliptic, 8–10.5(–12.5) × 3.5–5(–8) cm, thickly leathery, both surfaces glabrous, lateral veins ca. 6 on each side of midrib, base cuneate or obtuse, apex acute. Inflorescence paniculate, ca. 12 cm, many-flowered, puberulent. Flowers very fragrant. Calyx tube-shaped, tapering to funnel-shaped at base, ca. 7 mm, densely stellate puberulent, 5-lobed, lobes triangular ovate, ca. 1 mm, apex acute. Petals 5, white, spatulate, slightly thickened, ca. 10 × 2 mm, sparsely puberulent, apex obtuse. Androgynophore 2–2.3 cm, glabrous, apically 5-lobed. Ovary ovoid, ca. 1 mm in diam., 5-grooved, puberulent; style minute; stigma very short. Fruit unknown.

- Guangxi (Shiwan Dashan).

5. *Reevesia lancifolia* H. L. Li, J. Arnold Arbor. 25: 208. 1944.

剑叶梭罗 jian ye suo luo

Trees, to 12 m tall. Branchlets puberulent, glabrescent. Petiole 1–2.5 cm, glabrous; leaf blade lanceolate or oblong-lanceolate, 8–12 × 1.5–2.5 cm, both surfaces glabrous, lateral veins 6–7 on each side of midrib, not prominent, base cuneate, apex long acuminate. Inflorescence cymose, up to 7 cm, many-flowered, stellate puberulent. Pedicel 6–8 mm. Calyx obconical campanulate, 5–6 × ca. 4 mm, abaxially sparsely stellate puberulent, 4–5-lobed, lobes oblong, ca. 1 mm, apex acute. Androgynophore ca. 2.5 cm. Ovary glabrous. Fruiting stipe 2–2.5 cm; capsule ellipsoid-pyriform, shallowly 5-lobed and longitudinally grooved, 3.5–4 × 2.4–2.8 cm, gray scaled. Seeds ca. 2.6 cm including wing, wing oblong, ca. 2 cm.

- Dense montane forests. Hainan (Qiongzong, Wuzhi Shan).

6. *Reevesia pycnantha* Y. Ling, Acta Phytotax. Sin. 1: 205. 1951.

密花梭罗 mi hua suo luo

Trees, 6–10 m tall. Branchlets gray, striate, glabrous, or slightly puberulent when young. Petiole 1.5–2.5 cm, glabrous; leaf blade obovate-oblong, 8–12 × 2.5–5 cm, papery, both surfaces glabrous or sparsely puberulent at base of midrib when young, lateral veins 7 or 8 on each side of midrib, base rounded or shallowly cordate, margin entire, or sparsely denticulate, apex acute or acuminate. Inflorescence thyrsoid, ca. 5 cm, densely many-flowered, red-brown stellate puberulent. Pedicel 2–3 mm. Calyx obconical campanulate, ca. 3 mm, both surfaces puberulent, 5-lobed, lobes broadly triangular, less than 1 mm. Petals 5, yellowish, narrowly spatulate, ca. 7 × 1.5 mm. Androgynophore ca. 1 cm, glabrous. Ovary puberulent. Capsule ellipsoid-pyriform, 1.5–2 × 1–1.5 cm, apex truncate, densely yellowish brown puberulent. Seeds ca. 1.6 cm including wing, wing oblong-falcate or oblong-elliptic. Fl. May–Jul.

- Mixed forests near villages; below 100–300 m. W Fujian, E Jiangxi (Shicheng).

7. *Reevesia thyrsoidea* Lindley, Quart. J. Sci. Lit. Arts, ser. 2, 2: 112. 1827.

两广梭罗 liang guang suo luo

Trees, evergreen; bark gray-brown. Branchlets brownish black when dried, sparsely stellate puberulent. Petiole 1–3 cm, swollen at both ends; leaf blade oblong to elliptic, 5–7 × 2.5–3 cm, leathery, both surfaces glabrous, lateral veins 5–7 on each side of midrib, base rounded or obtuse, apex acute or acuminate. Inflorescence cymose-corymbose, densely flowered, puberulent. Calyx campanulate, ca. 6 mm, abaxially stellate puberulent, adaxially hairy on upper part, 5-lobed, lobes ca. 2 mm, apex acute. Petals 5, white, spatulate, slightly extending outward, ca. 10 mm. Androgynophore 2–3 cm. Ovary globose, 5-celled, hairy. Capsule on ca. 2 cm stipe, oblong-pyriform, 5-angular, ca. 3 cm, puberulent. Seeds ca. 2 cm including wing. Fl. Mar–Apr.

- Forested slopes or stream banks; 500–1500 m. C, E, and S Guangdong, S Guangxi, Hainan [Cambodia, Vietnam].

8. *Reevesia longipetiolata* Merrill & Chun, Sunyatsenia 2: 40. 1934.

长柄梭罗 chang bing suo luo

Trees, 8–25 m tall; bark gray-brown. Branchlets purplish black when dried, at first slightly hairy. Petiole 1.5–4 cm, swollen at both ends, glabrous; leaf blade oblong or oblong-ovate, 7–15 × 3–6 cm, both surfaces glabrous, glossy, lateral veins 8–12 on each side of midrib, base cuneate, apex obtuse or acute. Inflorescence cymose-corymbose, to 10 cm, densely stellate puberulent. Pedicels ca. 7 mm. Calyx obovoid-campanulate, 8–9 mm, abaxially stellate puberulent, 3–5-lobed, lobes oblong ovate, ca. 1.5 mm. Petals 5, white, oblanceolate, ca. 20 × 4 mm, clawed, glabrous. Androgynophore 2–2.5 cm, glabrous. Ovary ovoid, densely hairy. Capsule oblong-pyriform, 4–4.5 × ca. 2.5 cm, 5-angular, sparsely pubescent. Seeds ca. 2.5 cm including wing. Fl. Mar–Apr.

- Dense montane forests. Hainan.

Reevesia longipetiolata is very similar to *R. thyrsoidea* but differs in having larger leaves, 7–15 × 3–6 cm, with 8–12 lateral veins on each

side of midrib (vs. 5–7 × 2.5–3 cm, with 5–7 lateral veins), and a larger calyx (8–9 mm vs. ca. 6 mm).

9. *Reevesia orbicularifolia* H. H. Hsue, Acta Phytotax. Sin. 15(1): 81. 1977.

圆叶梭罗 yuán yè suǒ luó

Trees, to 10 m tall, to 30 cm d.b.h.; bark gray-brown. Branchlets glabrous or sparsely brownish or gray stellate puberulent when young. Petiole 3.5–7 cm, glabrous or sparsely hairy; leaf blade orbicular or ovate-orbicular, 7–18 × 6–16 cm, leathery, abaxially densely yellowish brown stellate puberulent, adaxially sparsely stellate puberulent, glabrescent, basal veins 5, prominent abaxially, impressed adaxially, base rounded or truncate, apex rounded or obtusely acuminate. Flowers not seen. Capsule ellipsoid-pyriform, 5-angular, brown to dark brown, ca. 2.5 × 1.5–2 cm, sparsely yellowish brown stellate puberulent and scaly. Seeds ca. 2.2 cm including wing, wing brown, oblong, slightly falcate, apex obtuse. Fr. Dec.

- Secondary forests on limestone; ca. 1500 m. Yunnan (Xichou).

This species is easily distinguished from all but the following species by its orbicular or rarely ovate-orbicular leaves and its glabrous or sparsely pubescent branchlets and petioles.

10. *Reevesia rotundifolia* Chun, Sunyatsenia 1: 269. 1934.

粗齿梭罗 cū chí suǒ luó

Trees, to 16 m tall; bark gray. Branchlets densely yellowish brown stellate puberulent. Petiole 4–4.5 cm, hairy; leaf blade orbicular or obovate-orbicular, 6–11.5 × 6–11.5 cm, sometimes wider than long, thinly leathery, abaxial surface yellowish brown puberulent along veins and midrib, adaxial surface densely yellowish brown puberulent, lateral veins 5–6 on each side of midrib, base truncate or rounded, with 2–3 teeth on upper margin, apex rounded or truncate with acumen. Inflorescence flat-topped, 5–8 cm, dense. Pedicels ca. 6 mm, pubescent. Calyx funnel-shaped, ca. 10 mm, abaxially densely softly brown pubescent, 3-lobed, lobes broadly triangular, ca. 1.5 mm. Petals white, spatulate clawed, apex rounded. Androgynophore ca. 2.5 cm; anther head ca. 2 mm in diam. Ovary ovoid, ca. 1.5 mm, pubescent; style short, inconspicuous; stigmas small, globose. Capsule obovoid-oblong, 5-angular, 3–4 cm, apex rounded, yellowish puberulent or gray scaly. Seeds ca. 2.5 cm including wing, wing brown. Fl. May.

- Mountains; ca. 1000 m. Guangdong, S Guangxi (Shiwan Dashan).

11. *Reevesia glaucophylla* H. H. Hsue, Acta Phytotax. Sin. 8: 272. 1963.

瑶山梭罗 yáo shān suǒ luó

Trees, 8–16 m tall; bark gray or gray-brown, exfoliating longitudinally. Branchlets nearly glabrous. Petiole 2–5 cm, hairy; leaf blade elliptic, oblong, or oblong-ovate, 8–13.5 × 4–7 cm, papery or thinly leathery, abaxially densely gray stellate puberulent and usually glaucous, adaxially yellowish brown stellate puberulent along veins and midrib, base obtuse, rounded or shallowly cordate, apex acute. Inflorescence cy-

mose, corymbose, 4–6 cm, yellowish brown stellate puberulent. Flowers very small. Pedicels slender, ca. 4 mm. Calyx ca. 3 mm, abaxially densely yellowish brown stellate puberulent, 5-lobed, lobes triangular, ca. 1 mm. Petals 5, oblong-oblongate, ca. 4 mm, base tapering from middle into slender claw, apex obtuse. Androgynophore slender, ca. 0.8 cm. Ovary globose, 5-grooved, hairy; style very short; stigma minute. Capsule narrowly ellipsoid or obovoid, 5-angled, ca. 1.5 cm, densely yellowish brown stellate puberulent. Seeds ca. 1.4 cm including wing, wing red-brown, apex acute. Fl. May–Jun.

- Open valley forests. Guangdong, Guangxi, S Guizhou, W Hunan.

12. *Reevesia tomentosa* H. L. Li, J. Arnold Arbor. 24: 446. 1943.

绒果梭罗 róng guǒ suǒ luó

Trees, to 12 m tall. Branchlets densely yellowish brown stellate puberulent. Petiole 1–3 cm, densely yellow-brown hairy; leaf blade oblong-ovate or obovate, 8–14 × 3–6 cm, leathery, abaxially densely yellow-brown puberulent, adaxially sparsely stellate puberulent, lateral veins 6–10 on each side of midrib, base rounded or shallowly cordate, apex acute or obtuse. Inflorescence cymose, corymbose. Pedicels 4–5 mm. Calyx campanulate, ca. 4 mm, densely yellow-brown hairy, 5-lobed. Androgynophore ca. 2.4 cm. Fruiting stipe 2.5–3 cm; capsule obovoid-oblong, slightly oblate, 5-angled, ca. 4 × 3 cm, densely stellate puberulent, base acute, apex rounded. Seeds ca. 2.6 cm including wing, wing brown, oblong, apex obliquely rounded.

- S Fujian, N and NE Guangdong, SE Guangxi [Myanmar].

13. *Reevesia rubronervia* H. H. Hsue, Acta Phytotax. Sin. 13(1): 108. 1975.

红脉梭罗 hóng mài suǒ luó

Trees, to 8 m tall. Branchlets densely red-brown stellate tomentose. Petiole 1.5–3.5 cm, hairy; leaf blade elliptic or oblong, 7.5–14 × ca. 4.6 cm, papery, abaxially densely yellowish brown stellate tomentose, and densely reddish brown tomentose along main veins, adaxially nearly glabrous or minutely red-brown stellate tomentose along midrib and lateral veins, lateral veins 7–9 on each side of midrib, base obtuse or nearly rounded, apex obtuse. Inflorescence cymose, corymbose, ca. 4 cm, densely reddish brown stellate tomentose. Calyx campanulate, ca. 9 mm, densely yellowish brown tomentose, 4- or 5-lobed, lobes triangular, ca. 2 mm. Petals 5, white, spatulate, ca. 15 mm, sparsely puberulent, apex rounded, extending sideways to form 2 ear-shaped appendages. Androgynophore 1.7–3 cm, glabrous. Ovary globose, ca. 1.5 mm in diam., yellowish hairy; style short, not apparent. Capsule narrowly ellipsoid, 5-angled, 2.5–3 cm, apex obtuse or rounded, yellow-brown puberulent. Seeds ca. 1.5 cm including wing. Fl. Apr–May.

- Limestone forests; ca. 1000 m. SE Yunnan (Funing).

The red midrib and lateral veins, especially of young leaves, and the narrowly ellipsoid capsule with a rounded or obtuse apex readily distinguish *Reevesia rubronervia* from other species.

14. *Reevesia pubescens* Masters in J. D. Hooker, Fl. Brit. India 1: 364. 1874.

梭罗树 suo luo shu

Trees, to 16 m tall; bark gray, exfoliating longitudinally. Branchlets stellate puberulent when young. Petiole 5–6.5 cm, sometimes swollen at both ends; leaf blade elliptic-ovate, oblong-ovate, ovate-lanceolate, or elliptic, 7–19 × 4–8(–10) cm, thinly leathery or papery, drying greenish or blackish brown, abaxially densely stellate tomentose, pilose, or glabrous, adaxially sparsely puberulent or nearly glabrous, base obtuse, rounded or shallowly cordate, sometimes oblique, apex acuminate or acute. Inflorescence cymose, corymbose, ca. 7 cm, hairy. Pedicels 8–11 mm, shorter than flowers. Calyx obconical, 5–8 mm, 5-lobed, lobes broadly ovate, apex acute. Petals 5, white or pink, linear-spatulate, 5–15 mm, puberulent adaxially. Androgynophore 1.2–3.5 cm. Ovary globose, 5-locular, densely hairy. Capsule pyriform or oblong-pyriform, 5-angled, 2.5–3.5(–5) cm, densely brownish puberulent. Seeds ca. 2.5 cm including wing. Fl. May–Jun.

Valley forests, thickets, hillsides, slopes; 500–2500 m. Guangxi, S Guizhou, Hainan, Hunan, Sichuan, Yunnan [Bhutan, India, Laos, Myanmar, Thailand].

Reevesia pubescens is sometimes included with *R. wallichii* R. Brown.

- 1a. Leaf blade abaxially very sparsely stellate pilose or glabrous; petals ca. 5 mm; androgynophore 1.2–1.5 cm 14d. var. *xuefengensis*
- 1b. Leaf blade abaxially stellate pilose or pubescent to almost glabrous; petals 10–15 mm; androgynophore 1.5–3.5 cm.
- 2a. Leaf blade abaxially densely stellate pubescent 14a. var. *pubescens*
- 2b. Leaf blade abaxially sparsely stellate pilose to almost glabrous.
- 3a. Leaves green to greenish brown when dried, abaxially glabrous, base usually not oblique, rounded to cordate 14b. var. *siamensis*
- 3b. Leaves blackish brown when dried, abaxially sparsely pilose, base oblique, truncate or rounded 14c. var. *kwangsiensis*

14a. *Reevesia pubescens* var. *pubescens*

梭罗树(原变种) suo luo shu (yuan bian zhong)

Eriolaena yunnanensis W. W. Smith; *Reevesia cavaleriei* H. Léveillé & Vaniot; *R. membranacea* H. H. Hsue; *R. sinica* E. H. Wilson; *R. wallichii* R. Brown f. *pubescens* (Masters) Malick.

Leaf blade 7–12(–17) × 4–6(–8) cm, abaxially densely stellate pubescent. Petals 10–15 mm. Androgynophore 2–3.5 cm.

Open thickets, dry hillsides; 500–2500 m. Guangxi, S Guizhou, Sichuan, Yunnan [Bhutan, N India, Laos, Myanmar, N Thailand].

Léveillé (Fl. Kouy-Tchéou, 405. 1914–1915) misidentified material of this species as *Reevesia thyrsoides* Lindley. A record of *R. wallichii* R. Brown from the Flora area by Dunn (J. Linn. Soc., Bot. 39: 484. 1911) was based on *Henry 11510*, a gathering of *R. pubescens* var. *pubescens*.

"*Reevesia megaphylla*" (Hu, Econ. Pl. Yunnan, 189. 1972) belongs here but was not validly published.

14b. *Reevesia pubescens* var. *siamensis* (Craib) J. Anthony, Notes Roy. Bot. Gard. Edinburgh 15: 129. 1926.

泰梭罗 tai suo luo

Reevesia siamensis Craib, Bull. Misc. Inform. Kew 1924: 90. 1924.

Leaf blade 7–14 × 4–7 cm, drying greenish brown, abaxially glabrous. Petals 10–15 mm. Androgynophore 1.5–2.5 cm, slender.

Dense valley forests; 1000–1600 m. S Yunnan [Myanmar, Thailand].

14c. *Reevesia pubescens* var. *kwangsiensis* H. H. Hsue, Acta Phytotax. Sin. 15(1): 82. 1977.

广西梭罗 guang xi suo luo

Petiole up to 4.5 cm; leaf blade drying blackish brown, papery, ovate-lanceolate, abaxially sparsely pilose, base obliquely truncate or rounded, basal veins 5, indumentum sparser and shorter. Petals 10–15 mm. Androgynophore 2–3.5 cm.

- SE Guangxi (Longzhou).

14d. *Reevesia pubescens* var. *xuefengensis* C. J. Qi, Acta Phytotax. Sin. 22: 493. 1984.

雪峰山梭罗 xue feng shan suo luo

Reevesia xuefengensis (C. J. Qi) C. J. Qi.

Leaf blade ovate-oblong, 12–19 × 6–8 cm, abaxially sparsely pilose or glabrous, base shallowly cordate or truncate. Flowers small. Petals ca. 5 mm. Androgynophore 1.2–1.5 cm.

- Hunan.

15. *Reevesia lumlingensis* H. H. Hsue ex S. J. Xu, Acta Phytotax. Sin. 38: 566. 2000.

隆林梭罗 long lin suo luo

Trees or shrubs. Branchlets brown pubescent when young. Petiole 2.5–3 cm, brown pubescent; leaf blade oblong-elliptic, 13–18 × 5–6.5 cm, thinly leathery, abaxially sparsely stellate pilose on veins, adaxially glabrous, basal veins 5, impressed adaxially, base rounded, apex rounded or acute. Inflorescences terminal or subterminal, apparently few-flowered. Flowers not seen. Fruiting stipe 3–5 cm; capsule ellipsoid-obovoid, 5-angled, 4.5–5 cm, brown stellate pubescent. Seeds ca. 3 cm including wing. Fr. Jun.

- Guangxi (Longlin).

6. *HELICTERES* Linnaeus, Sp. Pl. 2: 963. 1753.

山芝麻属 shan zhi ma shu

Trees or shrubs. Branches or branchlets ± stellate. Leaves simple, entire or serrate. Flowers bisexual, solitary or cymose, axillary or rarely terminate. Epicalyx lobes minute. Calyx tube-shaped, 5-lobed, lobes usually unequal and 2-lipped. Petals 5, equal to each other or 2-lipped, clawed and usually with auriculate appendage. Anthers 10, on top of elongate androgynophore; filaments ± connate, enclosing pistil; staminodes 5, within stamens. Ovary 5-celled, 5-angular; ovules numerous in each locule; styles 5, linear, apically slightly swollen. Mature capsule straight or spirally twisted, usually densely hairy, often with soft setae which are themselves hairy. Seeds verrucose.

About 60 species: tropical America and Asia; ten species (one endemic) in China.

- 1a. Capsule spirally twisted, not setose; inflorescences several per axil, densely clustered; leaf blade broadly oblong-ovovate, apex somewhat truncate and usually lobed 1. *H. isora*
- 1b. Capsule not twisted, sparsely to densely softly setose; inflorescences 1 per axil, often spikelike or with subtending leaves very reduced to form a terminal thyrses; leaf blade usually narrower, apex not truncate, often not lobed.
- 2a. Leaf blade margin entire or rarely with a few minute teeth near apex.
- 3a. Capsule apex obtuse; petiole ca. 12 mm, leaf blade 6–10 cm, apex obtuse 2. *H. obtusa*
- 3b. Capsule apex pointed or beaked; petiole 3–9 mm, leaf blade 3.5–7.5 cm, apex usually acuminate, acute or obtuse with acumen (obtuse in *H. prostrata*).
- 4a. Subshrubs to 0.45 m tall, stems prostrate; leaf blade 2–3.5 cm 10. *H. prostrata*
- 4b. Shrubs 1–2 m tall, stems erect or ascending; leaf blade 3.5–7.5 cm.
- 5a. Branchlets pilose with gray-green hairs; leaf blade margin entire to apex; capsule with dense mixed stellate and long simple hairs 3. *H. angustifolia*
- 5b. Branchlets tomentose with yellow-brown hairs; leaf blade margin entire or denticulate near apex; capsule with dense long simple hairs 4. *H. lanceolata*
- 2b. Leaf blade margin obviously serrate or dentate from base.
- 6a. Calyx 12–18 mm; capsule 2.5–5 cm.
- 7a. Leaf blade margin lobed; petals white 8. *H. viscida*
- 7b. Leaf blade margin irregularly dentate; petals red or purplish red 9. *H. hirsuta*
- 6b. Calyx 4–6 mm; capsule 1.5–2 cm.
- 8a. Upper leaves of fertile shoots very reduced to a lax thyrses; petals yellow 5. *H. elongata*
- 8b. Upper leaves of fertile shoots not or only slightly reduced; petals red-purple or blue-purple.
- 9a. Leaf blade abaxially sparsely stellate pilose; petals with central line of hairs; stipules as long as petiole 6. *H. glabriuscula*
- 9b. Leaf blade abaxially densely brown stellate tomentose; petals glabrous; stipules ca. 2 × as long as petiole 7. *H. plebeja*

1. *Helicteres isora* Linnaeus, Sp. Pl. 2: 963. 1753.

火索麻 huó suǒ má

Helicteres chrysocalyx Masters; *H. roxburghii* G. Don.

Shrubs or small trees, up to 2(–8) m tall. Branchlets stellate puberulent. Stipules linear, 7–10 mm, caducous; petiole 0.8–2.5 cm, puberulent; leaf blade broadly oblong-ovovate, or almost circular, 10–12(–23) × 7–9(–17) cm, thinly leathery, abaxially densely puberulent to tomentose with mixture of stellate and simple hairs, adaxially stellate puberulent, base rounded or obliquely cordate, margin serrate, apex ± truncate with shortly acuminate tip and usually lateral lobes. Inflorescences axillary, usually 2 or 3 per axil, densely clustered, to 2 cm. Flowers 3.5–4 cm in diam. Epicalyx lobes subulate, to 7 mm. Sepals 17–20 mm, usually 4–5-lobed, lobes triangular, ± 2-lipped, densely stellate hairy. Petals red or purple, unequal in length, upper 2 larger, 1.2–1.5 cm, obliquely falcate. Androgynophore 3–4 cm, curved at tip. Stamens 10; staminodes 5, equal to filaments in length. Ovary slightly verrucose, spirally twisted after pollination. Capsule on ca. 2.5 cm stalk, cylindrical, conspicuously spirally twisted, black when mature, 4–8 × (0.5–)0.7–0.9(–1) cm, apex acute, with beak to 1 cm, densely

stellate puberulent at first, glabrescent. Seeds many, to 2 mm, angular, wrinkled, tomentose. Fl. Apr–Oct, fr. Oct–Jan.

Dry deciduous forests, scrub, dry grasslands on slopes; below 100–600 m. SE Hainan, S Yunnan [?Bhutan, Cambodia, India, Indonesia, Malaysia, Nepal, Sri Lanka, Thailand, Vietnam; N Australia].

The bark fiber is good for making ropes and clothing. The roots are of medicinal use.

2. *Helicteres obtusa* Wallich ex Masters in J. D. Hooker, Fl. Brit. India 1: 366. 1874.

钝叶山芝麻 dùn yè shān zhī má

Shrubs or subshrubs. Branchlets yellow-brown puberulent. Petiole 0.6–1.2 cm, yellow-brown puberulent; leaf blade oblong, 6–10 × ca. 2.5 cm, densely yellow-brown stellate puberulent on both surfaces, particularly abaxially, basal veins 3, base rounded, margin entire, apex obtuse. Inflorescence cymose, spikelike, slightly longer than petiole. Flowers small, ca. 6 mm. Epicalyx lobes 3, acute, on pedicel; flower bud globose. Calyx cylindrical campanulate, apex irregularly 4- or 5-lobed. Petals purple. Capsule cylindrical, 2–2.5 cm, apex obtuse, densely villous-setose. Fl. throughout year.

S Yunnan [India (Andaman and Nicobar Islands), Myanmar, Thailand].

3. *Helicteres angustifolia* Linnaeus, Sp. Pl. 2: 963. 1753.

山芝麻 shan zhi ma

Small shrubs, up to 1 m tall. Branchlets gray greenish puberulent. Petiole 5–7 mm; leaf blade narrowly oblong or linear-lanceolate, 3.5–5 × 1.5–2.5 cm, glabrous or nearly so adaxially, gray or yellowish stellate tomentose, or sometimes also hirsute abaxially, base rounded, apex obtuse or acute. Inflorescence cymose, 2- or many-flowered. Pedicel usually with 4 pointed bracteoles. Calyx tube-shaped, ca. 6 mm, stellate puberulent, 5-lobed, lobes triangular. Petals 5, unequal in length, pale blue, pink, or purplish, darker at base of limb, slightly longer than calyx, reflexed at anthesis, uniformly pubescent, claws 2-auriculate. Staminodes linear, very short. Ovary 5-celled, hairy, slightly shorter than style; ovules ca. 10 in each locule. Capsule ovoid-oblong, 12–20 × 7–8 mm, densely setose, setae relatively slender, sparsely hairy, apex acute. Seeds small, brown, with elliptic spots. Fl. almost throughout year.

Sloping grasslands. S Fujian, Guangdong, C and S Guangxi, Hainan, Hunan, Jiangxi, Taiwan, S Yunnan [Cambodia, Indonesia, Japan, Laos, Malaysia, Myanmar, Philippines, Thailand, Vietnam; Australia].

The bark is a source of useful fibers, and the roots and leaves are used medicinally.

4. *Helicteres lanceolata* Candolle, Prodr. 1: 476. 1824.

剑叶山芝麻 jian ye shan zhi ma

Shrubs, 1–2 m tall. Branchlets densely yellow-brown stellate puberulent. Petiole 3–9 mm; leaf blade lanceolate or oblong-lanceolate, 3.5–7.5 × 2–3 cm, both surfaces yellow-brown stellate puberulent, denser abaxially, base obtuse, margin entire or sparsely dentate toward apex, apex acute or acuminate. Inflorescence with flowers fascicled or in 1–2 cm cyme, axillary. Flowers small, ca. 12 mm. Calyx tube-shaped, 5-lobed, hairy. Petals 5, purple, unequal in length, claw and central part of limb hairy. Androgynophore tomentose at base. Staminodes linear-lanceolate. Ovary pilose; ovules ca. 12 per locule. Capsule cylindrical, 2–2.5 × ca. 0.8 cm, apex beaked, densely villous. Fl. Jul–Nov.

Scrub, grasslands. C Guangdong, SE Guangxi, SE Yunnan (Zhenyuan) [Cambodia, Indonesia, Laos, Myanmar, Thailand, Vietnam].

5. *Helicteres elongata* Wallich ex Masters in J. D. Hooker, Fl. Brit. India 1: 365. 1874.

长序山芝麻 chang xu shan zhi ma

Shrubs, ca. 1 m tall. Branchlets very slender, stellate puberulent; upper leaves of fertile shoots reduced to a lax thyrse. Stipules linear, ca. 5 mm, caducous; petiole 0.6–1.3 cm; leaf blade oblong-lanceolate or oblong-ovate, 5–11 × (2–)2.5–3.5(–4) cm, stellate puberulent and villous abaxially, sparsely stellate adaxially, base obliquely rounded, margin irregularly dentate, apex acuminate. Inflorescence racemelike, axillary or terminal, as long as or longer than leaves, many-flowered. Epicalyx lobes linear. Calyx tubelike campanulate, ca. 5 mm, 5-

lobed, lobes triangular, persistent, puberulent. Petals 5, yellow, 1 petal with auriculate appendix and central line of hairs. Androgynophore hairy. Stamens 10. Ovary 5-locular, hairy; ovules ca. 10 in each locule. Capsule long cylindrical, apex acute, 2–3.8 cm, densely gray-yellow shaggy. Fl. Jun–Oct.

Dry grasslands, roadsides; 200–1600 m. NW and W Guangxi, S and SE Yunnan [Bangladesh, ?Bhutan, India (Darjeeling, ?Sikkim), Myanmar, Thailand].

6. *Helicteres glabriuscula* Wallich ex Masters in J. D. Hooker, Fl. Brit. India 1: 366. 1874.

细齿山芝麻 xi chi shan zhi ma

Corchorus cavaleriei H. Léveillé; *Helicteres cavaleriei* (H. Léveillé) H. Léveillé.

Shrubs, up to 1.5 m tall. Branches slender, densely stellate hairy when young, glabrescent. Stipules pointed, ca. 0.3 cm; petiole ca. 3 mm, hairy; leaf blade obliquely lanceolate, 3.5–10 × 1.5–3 cm, sparsely stellate puberulent, base obliquely cordate, margin denticulate, apex acuminate. Inflorescence cymose, axillary, 2–3-flowered; peduncle ca. 1/2 as long as leaf blade. Calyx tube-shaped, 4–5 mm, 5-lobed, lobes acute, puberulent. Petals 5, purple or blue-purple, ca. 2 × as long as calyx, broad distal part hairy on central area. Stamens 10, on top of androgynophore. Ovary 5-locular, hairy; stigma 5-lobed. Capsule long terete, 1.5–2 × ca. 1.2 cm, densely villous, apex short-beaked. Seeds many, very small. Fl. almost throughout year.

Grassy slopes, bushlands. SW Guangxi, Guizhou, S Yunnan [Myanmar].

Helicteres glabriuscula is very similar to *H. elongata*, but it differs in having leaf blades abaxially much more sparsely hairy, with more coarsely denticulate margins, basal veins 5, inflorescences always axillary, and petals purple or bluish purple, not yellow.

7. *Helicteres plebeja* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 39: 67. 1870.

矮山芝麻 ai shan zhi ma

Shrubs, ca. 0.6 m tall. Branchlets erect, very slender, brown stellate when young, glabrescent. Stipules pointed, 6–8 mm, hairy, caducous; petiole 0.3–0.4 cm; leaf blade obliquely linear-lanceolate, 8–10.5 × 1.2–2.5(–3) cm, both surfaces densely brown tomentose when young, adaxially glabrescent, basal veins 3, lateral veins 3–5 on each side of midrib, fine and obscure, base rounded or cordate, margin dentate, apex acute. Inflorescence glomerulose, axillary, ca. 1 cm, few-flowered. Flowers small, red-purple; epicalyx lobes pointed. Calyx tube-shaped, 5–6 mm, teethlike lobes, stellate hirsute, teeth short triangular. Petals 5, apex rounded, glabrous, 4 petals with 2 or 1 auriculate appendices. Staminodes 5, broadly lanceolate, as long as filaments. Ovary ovoid, 5-locular, hairy; ovules 8–10 per locule. Capsule cylindrical, 1.5–1.7 × 0.6–0.7 cm, apex acute, yellow-brown stellate. Seeds small, dark brown.

Yunnan [?Bhutan, NE India, Laos, Myanmar, Thailand, Vietnam].

8. *Helicteres viscida* Blume, Bijdr. 79. 1825.

粘毛山芝麻 nian mao shan zhi ma

Shrubs, up to 2 m tall. Branchlets puberulent when young, glabrescent. Petiole 0.3–1 cm, hairy; leaf blade ovate or nearly circular, 6–15 × 4.5–8.5 cm, sparsely stellate adaxially, densely whitish stellate tomentose, basal veins 5–7, base cordate, margin irregularly dentate, apex long acuminate, usually shallowly lobed from middle. Flowers solitary or cymose, axillary. Pedicel articulate. Calyx tubular, 15–18 mm, densely pale stellate villous and puberulent, 5-lobed, lobes acute. Petals 5, white, unequal to each other in length, spatulate. Stamens 10; staminodes 5. Ovary verrucose, hairy; ovules ca. 8 per locule. Capsule cylindrical, 2.5–3.5 × 1–1.2 cm, apex acute, densely stellate villous and up to 4 mm long hairs. Seeds rhomboid, ca. 2 × 1 mm, with tiny longitudinal grooves. Fl. May–Jun.

Bushlands; 300–900 m. Hainan, Yunnan [Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

9. *Helicteres hirsuta* Loureiro, Fl. Cochinch. 2: 530. 1790.

雁婆麻 yan po ma

Helicteres spicata Colebrooke; *H. spicata* var. *hainanensis* Hance.

Shrubs, 1–3 m tall. Branchlets stellate. Petiole ca. 2 cm, densely tomentose; leaf blade ovate or ovate-oblong, 5–15 × 2.5–5 cm, both surfaces densely stellate puberulent, particularly abaxially, basal veins 5, base obliquely cordate or truncate, margin irregularly dentate, apex acuminate or acute. Inflorescence axillary, elongate, spikelike, one-sided, less than 1/2 as long as leaf blade, several-flowered. Pedicels shorter than flowers, articulate, with caducous epicalyx lobes at base. Calyx tubular, 12–15 mm, 4–5-lobed, puberulent. Petals red or red-purple, 2–2.5 cm, claw with pair of marginal teeth near apex. Androgynophore

glabrous. Stamens 10; staminodes 5, as long as filaments. Ovary verrucose; ovules 20–30 in each locule; style as long as ovary. Capsule long exserted on glabrous stalk, cylindrical, 3.5–4 × 1.1–1.2 cm, apex beaked, densely villous and verrucose. Seeds numerous, 1–2 mm in diam., surface rugose. Fl. Apr–Sep.

Open forests, bushlands. Guangdong, S Guangxi, Hainan [Cambodia, India, Laos, Malaysia, Philippines, Thailand, Vietnam].

Helicteres hirsuta is sometimes cultivated.

10. *Helicteres prostrata* S. Y. Liu, Acta Phytotax. Sin. 37: 601. 1999.

平卧山芝麻 ping wo shan zhi ma

Subshrub, ca. 0.45 m tall, stems many-branched, prostrate. Branchlets brown stellate pilose, glabrescent. Stipules linear, 3–4 mm, stellate pilose; petiole 2–4 mm, stellate pilose; leaf blade oblong or ovate-oblong, rarely circular, 2–3.5 × 1.1–3.5 cm, abaxially grayish white, densely brown stellate pilose, adaxially dark green, glabrous, basal veins 5, abaxially prominent, adaxially flat or slightly concave, base rounded or almost cordate, margin denticulate along apical half, ciliate, apex obtuse. Inflorescences 1 or 2 per axil, 2–5-flowered; bracts and epicalyx lobes linear. Calyx 5–7 mm, 5-lobed, densely stellate pilose, lobes triangular. Petals 5, purplish, slightly unequal, ca. 1 cm, fan-shaped with narrow claw, margin often 1- or 2-toothed at apex of claw, abaxially pilose, adaxially densely villous. Androgynophore ca. 5 mm, villous at base. Staminodes broadly lanceolate, scalelike. Ovary ovoid-globose, densely pilose; style ca. 1 mm. Capsule not seen. Fl. Jun–Jul.

• Guangxi (Tiandong).

7. KLEINHOVIA Linnaeus, Sp. Pl., ed. 2, 2: 1365. 1763.

鸚鵡麻属 zhe gu ma shu

Trees. Leaves ovate, entire, basally palmately 3–7-veined. Inflorescence terminal, cymose, forming a lax panicle. Flowers bisexual, zygomorphic. Epicalyx lobes minute, lanceolate. Sepals 5, free. Petals 5, unequal. Stamens 15; filaments connate into staminal tube, completely adnate to ovary stipe to form androgynophore, upper part of staminal tube enlarged and urceolate, enclosing pistil; anthers in 5 groups of 3, 2-celled; staminodes reduced to small teeth alternating with anther fascicles. Ovary on top of androgynophore, 5-loculed, 5-lobed; ovules 5 in each locule; style slender; stigma 5-lobed. Capsule membranous, inflated, loculicidal. Seeds 1–2 in each locule, globose, verrucose.

One species: tropical Africa, Asia, and Australia.

1. *Kleinhovia hospita* Linnaeus, Sp. Pl., ed. 2, 2: 1365. 1763.

鸚鵡麻 zhe gu ma

Trees, up to 12 m tall; bark gray, exfoliate. Branchlets gray-green, sparsely pilose. Petiole 3–5.5 cm; leaf blade broadly ovate or ovate, 5.5–18 × 5.5–18 cm, abaxially puberulent when young, adaxially glabrous, base cordate or subcordate, entire or sparsely dentate in upper part, apex acuminate or acute. Inflorescence a thyrse, to 50 cm, hairy. Flowers dense. Sepals pink,

petaloid, ca. 6 mm. Petals pink, shorter than sepals, 1-cucullate, yellow at apex, shorter than others. Androgynophore long, hairy. Ovary globose, hairy, usually only 1 ovule developed in each locule; style glabrous. Capsule broadly pyriform to almost globose, 5-angled, 1–1.7 cm, greenish pink when mature, pendulous. Seeds globose, 1.5–2 mm in diam., black or dark brown. Fl. Mar–Jul.

Hilly or montane forests. Hainan, Taiwan [throughout tropical Africa, Asia, Australia].

8. MELOCHIA Linnaeus, Sp. Pl. 2: 674 [“774”]. 1753, nom. cons.

马松子属 ma song zi shu

Herbs, subshrubs, shrubs, or rarely small trees, pubescent with stellate, simple, bifurcate or glandular hairs. Leaves simple, irregularly crenate-serrate, foliar nectaries lacking. Inflorescence an axillary or terminal cyme, sometimes congested; bracts conspic-

uous, persistent. Flowers bisexual, distylous or homostylous. Calyx campanulate, 5-lobed, persistent, sometimes accrescent. Petals 5, flat, not cucullate, without appendages, base clawed, free or shortly adnate to base of staminal tube, purple, yellow, orange, or white (sometimes with a yellow throat), persistent. Stamens 5, opposite to petals; filaments united into a staminal tube; anthers 2-thecae, extrorse, thecae parallel; staminodes absent. Ovary syncarpous, 5-celled, sessile or shortly stipitate; ovules (1 or)2 per locule; styles 5, free or basally connate; stigma slightly thickened. Capsule 5-valved, depressed globose or pyramidal and 5-winged, loculicidally or septicidally dehiscent (or both), often surrounded by persistent calyx and persistent withered corolla. Seeds 1 per cell, obovoid; cotyledons flat.

Between 50 and 60 species; primarily tropical and subtropical with centers of diversity in Malaysia and Pacific islands, and Central and South America; some species now pantropical weeds; one species in China.

1. *Melochia corchorifolia* Linnaeus, Sp. Pl. 2: 675. 1753.

马松子 ma song zi

Riedlea corchorifolia (Linnaeus) Candolle; *Visenia corchorifolia* (Linnaeus) Sprengel.

Herbs or subshrubs, less than 1 m tall, erect or decumbent. Branches yellow-brown, sparsely stellate puberulent. Stipules linear, 2–4 mm; petiole 5–25 mm; leaf blade ovate, oblong-ovate, or lanceolate, rarely obscurely 3-lobed, 2.5–7 × 1–1.3 cm, thinly papery, abaxially sparsely stellate puberulent, adaxially nearly glabrous, basal veins 5, base rounded or cordate, margin

dentate, apex acute or obtuse. Inflorescence a dense cyme or glomerule, terminal or axillary. Epicalyx lobes 4, linear, hairy. Calyx campanulate, 5-lobed, ca. 2.5 mm, abaxially villous and hispid, adaxially glabrous, lobes triangular. Petals 5, white, drying reddish, oblong, ca. 6 mm, narrowed at base. Stamens 5, connate at base, opposite petals. Ovary sessile, densely velutinous; styles 5, filiform. Capsule globose, 5-angular, 5–6 mm in diam., villous. Seeds 1 or 2 per cell, brown-black, ovoid, slightly triangular, 2–3 mm. Fl. summer–autumn.

Widespread weed. S of Chang Jiang [Japan; pantropical].

9. *WALThERIA* Linnaeus, Sp. Pl. 2: 673. 1753.

蛇婆子属 she po zi shu

Herbs or subshrubs, rarely woody, stellate puberulent. Stipules lanceolate; leaves simple, margin serrate. Inflorescence terminal or axillary, cymose, often congested. Flowers small, bisexual. Calyx 5-lobed. Petals 5, spatulate, persistent. Stamens 5, connate at base, opposite to petals; anthers 2-thecae, thecae parallel. Ovary sessile, 1-celled; ovules 2; style clavate or fimbriate at apex. Capsule 2-valved. Seed 1, with copious endosperm; cotyledons flat.

About 50 species: mostly in tropical America; one species in China.

1. *Waltheria indica* Linnaeus, Sp. Pl. 2: 673. 1753.

蛇婆子 she po zi

Waltheria americana Linnaeus; *W. americana* var. *indica* (Linnaeus) K. Schumann; *W. indica* var. *americana* (Linnaeus) R. Brown ex Hosaka; *W. makinoi* Hayata.

Erect or ascending subshrubs, up to 1 m tall, multi-branched. Branchlets densely puberulent. Petiole 0.5–1 cm; leaf blade ovate or long elliptic-ovate, 2.5–4.5 × 1.5–3 cm, both surfaces densely puberulent, base rounded or shallowly cordate, margin serrulate, apex obtuse. Inflorescence cymose, capitate,

axillary; peduncle nearly absent to 1.5 cm. Epicalyx lobes narrowly lanceolate, ca. 4 mm. Calyx tube-shaped, 5-lobed, 3–4 mm, lobes triangular, much longer than tube. Petals yellowish, spatulate, apex truncate, slightly longer than sepals. Filament tube enclosing ovary. Ovary sessile, puberulent; style inserted obliquely; stigma fimbriate. Capsule obovoid, ca. 3 mm, hairy, 1-seeded, enclosed by persistent calyx. Seed obovate, very small. Fl. summer–autumn.

Weed. Fujian, Guangdong, Guangxi, Taiwan, Yunnan [pantropical].

Waltheria indica is sometimes grown as an ornamental and is used medicinally.

10. *THEOBROMA* Linnaeus, Sp. Pl. 2: 782. 1753.

可可属 ke ke shu

Trees. Leaves alternate, large and entire. Inflorescence 1-flowered or cymose, usually on trunk or major branches. Flowers bisexual, small and perfect. Calyx 5-lobed, divided nearly to base. Petals 5, lower part deeply concave, middle part becoming narrow, upper spatulate. Stamens in 5 groups of 1–3, alternate with staminodes; filaments connate at base into tube; staminodes 5. Ovary sessile, 5-celled; ovules many per locule; stigma 5-lobed. Fruit large, drupaceous. Seeds many, embedded in pulp; cotyledons fleshy; endosperm absent.

About 22 species: tropical America; one species (introduced) in China.

1. *Theobroma cacao* Linnaeus, Sp. Pl. 2: 782. 1753.

可可 ke ke

Evergreen trees, to 12 m tall; bark thick, dark gray-brown.

Branchlets brown, puberulent. Stipules linear, caducous; leaf blade narrowly ovate- to obovate-elliptic, 20–30 × 7–10 cm, both surfaces glabrous or sparsely stellate, base rounded to shallowly cordate, apex long acuminate. Inflorescence small

and delicate, cymose. Flowers ca. 18 mm in diam.; pedicels ca. 12 mm. Calyx pink, lobes narrowly lanceolate, persistent, margin hairy. Petals 5, yellowish, lightly longer than calyx, lower part helmet-shaped and abruptly narrowed, reflexed, apex acute. Stamines linear. Ovary obovoid, slightly 5-angular, 5-celled; ovules 14–16 per locule, in 2 rows; style cylindrical. Drupe ellipsoid or narrowly ellipsoid, 15–20 × ca. 7 cm, longitudinally

10-grooved; endocarp thick, fleshy, hard and woody when dried, 4–8 mm thick. Seeds 12–14 per cell, ovoid, slightly flattened, ca. 2.5 × 1.5 cm. Fl. throughout year.

Cultivated. Hainan, S Yunnan [native of South America, now widely cultivated throughout wet tropics].

The seeds are important as the source of chocolate and cocoa.

11. AMBROMA Linnaeus f., Suppl. Pl. 54. 1782.

昂天莲属 ang tian lian shu

Trees or shrubs. Leaves cordate or ovate-elliptic, entire or serrate, sometimes palmately lobed. Inflorescence leaf-opposed or terminal, several-flowered. Flowers bisexual. Sepals 5, divided to near base. Petals 5, red-purple, abruptly narrowed below middle, lower part deeply concave, glandular, basally connate with staminodes, upper part narrower, spatulate. Stamens 15; filaments connate into tube enclosing pistil; anthers in 5 groups of 3 on outer part of filament tube alternating with staminodes; staminodes 5, apex obtuse, margin ciliate. Ovary sessile, 5-grooved, 5-celled; ovules many per cell; style 5-lobed. Capsule membranous, 5-angular or longitudinally 5-winged, apex truncate, dehiscence loculicidal, apical. Seeds many, with endosperm; cotyledons flat, cordate.

One or two species: tropical Asia to Australia; one species in China.

This generic name is sometimes given as "*Abroma*" (Jacquin, Hort. Bot. Vindob. 3: 3. 1776) but, as explained by Fosberg (Micronesica 2: 150. 1966), Jacquin did not validly publish either that name or "*Abroma fastuosum*" (Jacquin, loc. cit.).

1. *Ambroma augustum* (Linnaeus) Linnaeus f., Suppl. Pl. 341. 1782 [*"augusta"*].

昂天莲 ang tian lian

Theobroma augustum Linnaeus, Syst. Nat., ed. 12, 3: 233. 1768 [*"augusta"*].

Shrubs, 1–4 m tall. Branchlets densely stellate velutinous when young. Stipules linear, 5–10 mm, caducous; petiole 1–10 cm; leaf blade cordate or ovate-cordate, sometimes 3–5-lobed, 10–22 × 9–18 cm, abaxially glabrous or sparsely stellate, adaxially densely puberulent, basal veins 3–7, prominently raised on both surfaces, base cordate or obliquely cordate, apex acute or acuminate. Inflorescence cymose, 1–5-flowered. Flowers ca. 5 cm in diam., pendulous. Sepals lanceolate, 15–18 mm, both sur-

faces densely puberulent. Petals dark reddish purple, ca. 2.5 cm, basal part as broad as long and hairy, upper part elliptic-spatulate, apex acute or obtuse. Stamines nearly spatulate, both surfaces hairy. Ovary oblong, ca. 1.5 mm, slightly hairy, 5-grooved; style triangular-tongue-shaped, 1/2 as long as ovary. Capsule erect, obconic, 3–6 cm in diam., stellate hairy, 5-winged, cuplike after dehiscence, margins villous. Seeds oblong, black, ca. 2 mm. Fl. spring and summer.

Forest margins, valley gullies. Guangdong, Guangxi, Guizhou, Yunnan [Bhutan, India, Indonesia, Malaysia, Nepal, Philippines, Thailand, Vietnam; Australia, Pacific islands].

The bark of this species provides a high-quality fiber used for making rope and fishing lines. It is also a medicinal plant, used in particular for the treatment of diabetes, and is grown as an ornamental.

12. BYTTNERIA Loefling, Iter Hispan. 313. 1758, nom. cons.

刺果藤属 ci guo teng shu

Butneria Duhamel du Monceau.

Lianas, shrubs, or subshrubs, rarely small trees. Stems armed or unarmed (in Flora area). Leaves simple, stipulate, petiolate; leaf blade various shapes, but usually orbicular or ovate; foliar nectaries present. Inflorescences axillary, cymes. Flowers bisexual, small. Sepals 5, connate at base. Petals 5, base clawed, upper part deeply concave, apex with long narrow appendage. Stamens 5, opposite petals; filaments connate into tube; anthers 2-celled, extrorse; staminodes 5, lamellate, apex obtuse, alternate with staminodes. Ovary sessile, 5-celled; ovules 2 per cell, anatropous, lower one aborted; style united almost to apex; stigma apical, inconspicuous or 5-lobed. Capsule globose, spiny, septicidally and loculicidally or only septicidally dehiscent into 5 valves, valves falling from axis. Seeds 1 per locule; endosperm absent; cotyledons foliaceous, 2-lobed.

About 130 species: mostly in tropical America, also Africa, SE Asia, Madagascar; three species in China.

The genus name has often been incorrectly spelled as "*Buettneria*."

- 1a. Leaf margin serrulate, leaf blade scabrous; capsule spines branched, soft 1. *B. pilosa*
 1b. Leaf margin entire, leaf blade not scabrous; capsule spines not branched, hard.
 2a. Leaf blade abaxially densely white stellate tomentose; capsule 3–4 cm in diam., spines short and robust;
 seeds ca. 12 mm, black when mature 2. *B. grandifolia*
 2b. Leaf blade abaxially glabrous or sparsely stellate pubescent on veins; capsule 1.5–2 cm in diam., spines long
 and needlelike; seeds ca. 5 mm, gray-brown with dark brown mottling 3. *B. integrifolia*

1. *Byttneria pilosa* Roxburgh, Fl. Ind. 2: 381. 1824 [*"Buettneria"*].

粗毛刺果藤 cu mao ci guo teng

Byttneria elegans Ridley; *B. pilosa* var. *pellita* Gagnepain.

Woody climbing lianas. Branchlets dark brown when dry, stellate hairy, glabrescent. Stipules linear, ca. 14 mm, caducous; petiole 12–15 cm, hairy; leaf blade orbicular or cordate, usually 3–5-lobed, 14–24 × 13–21 cm, both surfaces yellowish brown stellate puberulent and hirsute, denser abaxially, basal veins 7, base cordate, margin serrulate, apex obtuse or acute. Inflorescence a flat-topped cyme, axillary, few-flowered. Pedicels slender, ca. 2.5 mm. Sepals ca. 3 mm, abaxially hairy, adaxially glabrous. Petals 4-lobed, lobes obtuse. Staminodes partly connate, ca. 1.5 cm. Ovary globose, verrucose. Capsule yellowish pink, globose, ca. 2 cm in diam., densely spiny, spines branched and soft, 4–6 mm. Seed yellow with brown mottling, ovoid, ca. 5 mm.

Mixed forest margins; 500–1000 m. S Yunnan [Bangladesh, India, Indonesia, Laos, Malaysia, Myanmar, Thailand, Vietnam].

2. *Byttneria grandifolia* Candolle, Prodr. 1: 486. Jan 1824 [*"Buettneria"*].

刺果藤 ci guo teng

Byttneria aspera Colebrooke ex Wallich (Mar–Jun 1824); *B. siamensis* Craib.

Woody, big lianas. Branchlets sparsely puberulent when young. Petiole 2–8 cm, hairy; leaf blade broadly ovate, cordate, or nearly orbicular, 7–23 × 5.5–16 cm, abaxially white stellate

puberulent, adaxially glabrous, basal veins 5, base cordate, margin entire, apex obtuse or acute. Sepals ovate, ca. 2 mm, puberulent, apex acute. Petals yellowish white, and purple-red adaxially, apex 2-lobed, with long ligulate appendix, nearly as long as sepals. Capsule globose or ovoid-globose, 3–4 cm in diam., spiny, spines short and robust, puberulent. Seeds oblong, ca. 12 mm, black when mature. Fl. spring and summer.

Open forests, valley streamsides; 200–300 m. Guangdong, Guangxi, Hainan, Yunnan [Bangladesh, Bhutan, Cambodia, India, Laos, Nepal, Thailand, Vietnam].

3. *Byttneria integrifolia* Lace, Bull. Misc. Inform. Kew 1915: 396. 1915 [*"Buettneria"*].

全缘刺果藤 quan yuan ci guo teng

Large, woody lianas. Branchlets unarmed, purple-brown when dry, with several striate lines, sparsely stellate puberulent when young. Petiole 4–13 cm; leaf blade broadly ovate or elliptic-ovate, 15–22 × 9–16 cm, nearly glabrous or sparsely stellate on veins only, basal veins 5, veinlets parallel, base cordate or shallowly cordate, apex long acuminate or acute. Inflorescences umbel-like, slightly hairy. Pedicels slender, 4–7 cm, articulate near middle. Flowers 8–10 mm wide. Sepals lanceolate, 4–5 mm, connate basally, very sparsely pilose. Petals ca. 2 × 2–2.5 mm, with narrowly lanceolate ca. 3 mm appendix, adnate to staminal tube at base. Ovary very small, hairy. Capsule globose, 1.5–2 cm in diam., black when dry, with hard and pointed spines, spines 4–5 mm. Seeds gray-brown with dark brown mottling, oblong, ca. 5 mm.

Open forests; 800–1600 m. S Yunnan (Xishuangbanna) [Myanmar, Thailand].

13. COMMERSONIA J. R. Forster & G. Forster, Char. Gen. Pl. 22. 1775.

山麻树属 shan ma shu shu

Trees or shrubs. Leaves simple, usually oblique, serrate or divided. Inflorescence a paniclelike cyme, terminal or axillary. Flowers small. Calyx 5-divided, base enlarged and concave, apex elongate into long beltlike appendix. Stamens 5, opposite petals; anthers nearly globose, unequally 2-celled; staminodes 5, linear-lanceolate, opposite to sepals. Ovary sessile, 5-celled; ovules 2–6 per cell; style connate at base or free. Capsule 5-loculed, hispid, loculicidally dehiscent. Seeds with endosperm; cotyledons flat.

About nine species: tropical Asia, Australia; one species in China.

1. *Commersonia bartramia* (Linnaeus) Merrill, Interpr. Herb. Amboin. 362. 1917.

山麻树 shan ma shu

Muntingia bartramia Linnaeus, Amoen. Acad. 4: 124. 1759.

Trees, to 15 m tall. Branchlets densely yellow puberulent. Stipules palmately fimbriate; petiole 0.6–1.8 cm, hairy; leaf blade broadly ovate or ovate-lanceolate, 9–24 × 5–14 cm, abaxially densely gray-white puberulent, adaxially sparsely stellate puberulent, base obliquely cordate, margin irregularly dentate

and red ciliate, apex acute or acuminate. Inflorescence terminal or axillary, a compound cyme, 3–21 cm, many-branched. Flowers dense, ca. 5 mm in diam. Sepals 5, ovate, ca. 3 mm, puberulent. Petals 5, white, as long as sepals, base with 2 lateral lobes, apex beltlike. Stamens ca. 0.5 mm, each enclosed by base of subtending petal; staminodes 5, lanceolate, ca. 1.5 mm, both surfaces puberulent. Ovary with ovules 2 per locule. Capsule globose, ca. 2 cm in diam., 5-valved, densely long hispid. Seeds elliptic, black-brown, glossy. Fl. Feb–Oct.

Mixed forests on slopes, open valley forests; 100–400 m. Guangdong, Guangxi, S Yunnan [India, Indonesia, Malaysia, Philippines, Vietnam; Australia].

14. ERIOLAENA Candolle, Mém. Mus. Hist. Nat. 10: 102. 1823.

火绳树属 huo sheng shu shu

Wallichia Candolle (1823), not Roxburgh (1820), nor Reinwardt (1823).

Trees or shrubs, sometimes [?always] deciduous. Stipule linear, caducous; leaf blade mostly \pm cordate, rarely obscurely palmately lobed, or oblong and entire, stellate hairy, abaxially mostly densely so, sometimes nearly glabrous, margin \pm dentate. Inflorescence racemose, axillary or terminal, often 1–2-flowered, less often many-flowered. Epicalyx lobes 3–5, dentate or divided, rarely entire, falling at anthesis. Sepals 4 or 5, valvate, linear, apex acute, abaxially stellate hairy, adaxially villous. Petals 4 or 5, yellow or white, base tapering into flat villous claw, claw sharply recurved into S-bend with limb radially spreading. Stamens many, connate into monadelphous tube; filaments partly free; anthers linear-oblong, 2-celled, cells parallel; staminodes absent. Ovary sessile, 4–10-celled, tomentose; ovules many in each locule; style linear; stigma 4–10-lobed. Capsule woody or nearly woody, ovoid or narrowly ovoid, dehiscence loculicidal, valves 4–10, adaxial margin densely woolly. Seeds winged, wing membranous, as long as seeds; endosperm thin, cotyledons plicate.

About 17 species: tropical and subtropical Asia; six species (one endemic) in China.

Eriolaena is poorly represented in herbaria, and more gatherings, particularly of correlated flowering and fruiting material, are needed to clarify the taxa.

- 1a. Leaf blade abaxially sparsely hairy to glabrescent, epidermis visible between hairs; leaves always present during flowering and fruiting.
- 2a. Leaf blade glabrous or nearly so, veins of young leaves usually slightly pink; inflorescence a terminal, \pm flat-topped, many-flowered panicle 1. *E. glabrescens*
- 2b. Leaf blade abaxially yellow-brown stellate pubescent; inflorescence an axillary, few-flowered cyme 6. *E. kwangsiensis*
- 1b. Leaf blade stellate hairy, denser abaxially, often tomentose; leaves sometimes absent at flowering or fruiting.
- 3a. Material in flower, epicalyx lobes available.
- 4a. Epicalyx lobes 4–6(–10) mm, margins entire or nearly so.
- 5a. Pedicel nearly as long as flower; epicalyx lobes linear-lanceolate, ca. 4 mm; flowers mostly 4-merous, rarely 5-merous 2. *E. spectabilis*
- 5b. Pedicel shorter than flower; epicalyx lobes ovate or elliptic-ovate; flowers 5-merous 3. *E. quinquelocularis*
- 4b. Epicalyx lobes 10–15(–20) mm, margins obviously dentate, fimbriate, or pinnatipartite.
- 6a. Epicalyx lobe margin densely fimbriate, densely woolly stellate pilose 4. *E. wallichii*
- 6b. Epicalyx lobe margin dentate or pinnatipartite, shortly tomentose 5. *E. candollei*
- 3b. Material in fruit, epicalyx lobes lost.
- 7a. Capsule distinctly angular.
- 8a. Capsule 4-locular, angles scarcely verrucose, flat between ridges and nearly square in cross section 2. *E. spectabilis*
- 8b. Capsule 5-locular, angles strongly verrucose, grooved between ridges 4. *E. wallichii*
- 7b. Capsule rounded, smooth or longitudinally striate, not grooved between valves.
- 9a. Fruiting without leaves 3. *E. quinquelocularis*
- 9b. Fruiting with leaves 5. *E. candollei*

1. *Eriolaena glabrescens* Aug. Candolle, Bull. Herb. Boissier, sér. 2, 3: 370. 1903.

光叶火绳 *guang ye huo sheng*

Eriolaena glabrescens Hu (1924), not Aug. Candolle (1903).

Trees, up to 10 m tall, old leaves present at anthesis. Branchlets slightly stellate hairy or nearly glabrous. Petiole 2–3 cm, nearly glabrous; leaf blade orbicular or ovate-orbicular, 7–10 \times 6–10 cm, both surfaces sparsely stellate hairy when young, nearly glabrous or abaxially with scales or stellate hairs on veins and midrib when mature, basal veins 7, slightly pink abaxially, base shallowly cordate, apex acute or shortly acuminate. Inflorescence flat-topped, many-flowered; peduncle pink (reddish) stellate tomentose. Pedicel robust, ca. 1 cm; epicalyx lobes linear, ca. 14 mm, pinnately divided, apex acute, indumentum red. Sepals 5, linear-lanceolate, ca. 2.5 \times 0.5 cm, abaxially red stellate, adaxially tomentose, apex acuminate. Petals 5, yellow, oblong-spatulate, 2.5–3 \times ca. 0.8 cm, base tapering into stipe, tomentulose, apex obtuse. Stamens many, con-

nate into ca. 1.5 cm tube, free part very short. Ovary globose, 8-locular; style puberulent; stigma 8-lobed. Capsule ovoid or ovoid-ellipsoid, 3.5–4.5 cm, 8-valved, densely yellowish stellate tomentulose, apex acute or longer beaked. Seeds many, winged. Fl. Aug–Sep, fr. Nov–Dec.

Mountain slopes, valleys; 800–1300 m. S Yunnan [Thailand, S Vietnam].

Eriolaena glabrescens Hu is based on a different type (from Yunnan) than that of *E. glabrescens* Aug. Candolle (from Vietnam). The choice of the same epithet is a clear indication of the distinctive sparse indumentum.

2. *Eriolaena spectabilis* (Candolle) Planchon ex Masters in J. D. Hooker, Fl. Brit. India 1: 371. 1874.

火绳树 *huo sheng shu*

Wallichia spectabilis Candolle, Mém. Mus. Hist. Nat. 10: 104. 1823; *Eriolaena malvacea* (H. Léveillé) Handel-Mazzetti; *E. sterculiacea* H. Léveillé; *E. szemaoensis* Hu; *Microchlaena spectabilis* (Candolle) Endlicher ex Walpers; *Sterculia malvacea* H. Léveillé.

Deciduous shrubs or small trees, 3–8 m tall. Branchlets stellate puberulent. Stipule pointed linear, ca. 5 mm; petiole 2–5 cm, velutinous; leaf blade ovate or broadly ovate, 8–14 × 6–13 cm, abaxially densely gray-white or brownish stellate velutinous, adaxially sparsely slightly stellate hairy, basal veins 5–7, base cordate, margin irregularly minutely dentate, apex shortly acute. Inflorescence cymose, axillary, several-flowered, densely velutinous. Pedicels as long as flowers or slightly shorter; epicalyx lobes linear-lanceolate, entire, or rarely lobed, ca. 4 mm. Sepals 4(or 5), linear-lanceolate, 1.8–2.5 cm, densely stellate tomentulose. Petals 4(or 5), white or yellowish white, obovate-spatulate, as long as sepals, stipe thick, villous. Stamens many. Ovary ovoid, 8-celled, velutinous; style basally villous; stigma many-lobed. Capsule woody, ovoid or ovoid-ellipsoid, ca. 5 × 2.5 cm, verrucose and angular, deeply grooved between valves, apex obtuse or beaked. Fl. Apr–Jul.

Open forests, bushlands; 500–1300 m. NW Guangxi (Longlin), S Guizhou, S and SE Yunnan [Bhutan, India, Nepal].

3. *Eriolaena quinquelocularis* (Wight & Arnott) Wight, Icon. Pl. Ind. Orient. t. 882. 1840.

五室火繩 wu shi huo sheng

Microchlaena quinquelocularis Wight & Arnott, Prodr. Fl. Ind. Orient. 1: 71. 1834; *Wallichia quinquelocularis* (Wight & Arnott) Steudel.

Trees, to 10 m tall; bark gray-white. Branchlets sparsely stellate hairy when young. Petiole 1.5–3 cm; leaf blade round or broadly ovate, 5–8 cm in diam., thickly papery, abaxially densely white stellate puberulent, adaxially sparsely stellate puberulent, base cordate, margin obtusely dentate, apex obtuse or acute. Inflorescence cymose, terminal or axillary, up to 9 cm; peduncle robust, often 3-flowered. Pedicels shorter than flowers; epicalyx lobes entire, ovate or elliptic-ovate. Sepals 5, linear-lanceolate, ca. 2 cm, abaxially densely yellowish brown stellate tomentulose, hairs shorter adaxially, glandular at base. Petals 5, yellow, as long as sepals, apex obtuse, with broad stipe. Stamens as long as petals; stigmas 6–8, curved outward. Capsule long ellipsoid, 3–4.5 × ca. 2.5 cm, abaxially densely yellow-brown puberulent and mealy, 5–10-valved, not verrucose, valve loculicidal, lower 1/2 densely white villous, apex acute. Seeds 8 in each valve, arranged in 2 lines, ca. 2.5 cm including wing, wing membranous, oblong, apex obtuse, 1.3–1.8 cm. Fl. May.

Open forests, savannas; 800–1700 m. S Yunnan [India].

4. *Eriolaena wallichii* Candolle, Mém. Mus. Hist. Nat. 10: 104. 1823.

泡火繩 pao huo sheng

Trees, to 6 m tall. Branchlets stellate tomentose when young, hairs soon sparse. Stipules very quickly lost; petiole ca. 4.5 cm, stellate velutinous; leaf blade orbicular-ovate, sometimes obscurely 3-lobed, to ca. 16 × 14 cm, thickly papery, abaxially stellate tomentose, adaxially stellate puberulent, basal veins 7, base cordate, margin very shallowly obtusely dentate, apex acuminate to acute. Inflorescence terminal, to 6 cm, few-fruited; peduncle robust, glabrescent. Fruiting pedicel ca. 15 mm; epicalyx lobes ovate, ca. 1/2 as long as sepals, densely woolly stellate pilose, margins deeply fimbriate. Sepals 5, line-

ar-lanceolate, ca. 3 cm. Petals 5, obcordate, ca. 2/3 as long as sepals, apex emarginate. Staminal tube as long as petals. Ovary 5-locular; style puberulent, stigma lobes very short. Capsule cylindrical, ca. 3 × 2.5 cm, each valve with prominent verrucose keel, grooved between valves, apex shortly beaked, valves 8–10, adaxial margin conspicuously woolly pilose. Seeds ca. 10 per locule, arranged in 2 lines, ca. 1.5 cm including wing.

1300–1400 m. Yunnan [India, Nepal].

Eriolaena wallichii is known in the Flora area from just the one fruiting gathering, *A. Henry 12506A*, and flowering material is needed to confirm the identification. Flowering material has extremely distinctive very woolly fimbriate epicalyx lobes.

5. *Eriolaena candollei* Wallich, Pl. Asiat. Rar. 1: 51. 1830.

南火繩 nan huo sheng

Trees, 6–12 m tall; bark gray. Branchlets stellate puberulent. Petiole 1.5–3 cm; leaf blade orbicular or ovate-orbicular, usually slightly 3–5-lobed, 6–10 × 5.5–11 cm, thickly papery, abaxially densely gray-white stellate tomentose, adaxially sparsely stellate hairy, basal veins 5–7, base cordate or shallowly cordate, margin obtusely dentate, apex shortly pointed or shortly acuminate. Inflorescence cymose, terminal or axillary, up to 7 cm, many-flowered. Epicalyx lobes pinnately partite, linear, 1–1.5 cm. Sepals 5, linear-lanceolate, slightly longer than epicalyx lobes, densely yellowish brown tomentulose. Petals 5, yellow, oblong, apex emarginate, base narrowed into thick claw, base of claw villous. Ovary ovoid-globose; style glabrous; stigmas 8–10, twisted. Capsule ovoid-globose, ca. 5 × 2.5 cm, apex pointed and beaked, valves 5 or 6(–10), apex shortly pointed, abaxial surface keeled or not, adaxial margin sericeous. Seeds many, winged. Fl. Mar–Apr.

Open forests on slopes; 800–1400 m. Guangxi, SW Sichuan, S Yunnan [Bhutan, India, Laos, Myanmar, Thailand, Vietnam].

6. *Eriolaena kwangsiensis* Handel-Mazzetti, Sinensia 3(8): 193. 1933.

桂火繩 gui huo sheng

Eriolaena ceratocarpa Hu.

Trees or shrubs, up to 11 m tall; bark gray. Branchlets yellowish brown stellate puberulent. Petiole 2–5 cm, hairy; leaf blade orbicular or broadly cordate, 9–15 × 7–13 cm, leathery or thinly leathery, abaxially densely stellate puberulent, adaxially sparsely stellate hairy, basal veins 5–7, base cordate, margin obtusely dentate, apex shortly pointed or caudate, shortly acuminate. Inflorescence cymelike racemose, axillary, with several flowers, rarely up to 10. Pedicels 5–15 mm; epicalyx lobes spatulate tongue-shaped, 1–1.5 cm, obviously dentate, teeth acuminate. Sepals (4 or)5, linear-lanceolate, 2–2.5 cm abaxially, densely yellow-brown velutinous, adaxially gray villous. Petals (4 or)5, obovate-spatulate, apex shortly pointed, ca. 2.5 × 0.8 cm, villous only on thick claw. Staminal tube ca. 12 mm. Ovary ovoid, yellowish stellate velutinous; stigma lobes reflexed. Capsule elliptic-lanceolate in outline, 3.5–5 × 1.5–2 cm, ± smooth, apex long beaked. Seeds winged, 1.5–2 cm including wing. Fl. Jun–Aug.

• Dense valley forests or scrub; 800–1200 m. Guangxi, S Yunnan.

15. PENTAPETES Linnaeus, Sp. Pl. 2: 698. 1753.

午时花属 wu shi hua shu

Annual herbs. Leaves alternate; leaf blade simple. Flowers axillary, solitary or paired; epicalyx lobes 3, acute, caducous. Calyx 5-lobed, divided almost to base. Petals 5, red. Stamens 15, in 5 groups of 3 alternating with staminodes, connate at base into tube; staminodes 5, nearly as long as petals; anther 2-celled, extrorse. Ovary sessile, 5-locular; ovules many per locule; style elongated. Capsule ovoid-globose, dehiscent into 5 mericarps. Seeds 8–12 per mericarp, in 2 rows, elliptic, with endosperm; cotyledons 2-divided, plicate.

One species: widespread in tropical Asia; introduced in China.

1. *Pentapetes phoenicea* Linnaeus, Sp. Pl. 2: 698. 1753.

午时花 wu shi hua

Annual herbs, 0.5–1 m tall, sparsely stellate hairy. Petiole 1–2.5 cm; leaf blade linear-lanceolate, 5–10 × 1–2 cm, base broadly cuneate, rounded or truncate, margin crenate, apex acuminate. Flowers opening at noon, closing at dawn. Calyx lobes lanceolate, ca. 1 cm, abaxially stellate velutinous and hispid. Petals red, broadly ovate, ca. 12 mm. Stamines tongue-shaped, 12–13 × ca. 1 mm. Ovary ovoid, villous; ovules 8–12

per cell; style filiform, glabrous, ca. 1 cm. Capsule nearly globose, ca. 1.2 cm in diam., densely stellate hairy and hispid, shorter than persistent calyx. Fl. summer–autumn.

Cultivated, requires moist conditions. Guangdong, Guangxi, Sichuan, S Yunnan [Bangladesh, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Philippines, Sri Lanka, Thailand, Vietnam; N Australia; naturalized in Central America].

Pentapetes phoenicea is a plant of tropical Asia that is cultivated for its bright red flowers. It has become naturalized in many areas such that the native distribution is now obscured.

16. CORCHOROPSIS Siebold & Zuccarini, Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 3(2): 737. 1843.

田麻属 tian ma shu

Annual herbs; stems stellate or hairy with other types of hairs. Stipules minute, caducous; leaf blade simple, basal veins 3, margin dentate or serrate, stellate hairy. Inflorescence axillary, cymose, 1–3-flowered. Flowers bisexual. Sepals 5, narrowly lanceolate. Petals 5, yellow, obovate. Stamens usually 15, in 5 groups of 3 alternating with staminodes; staminodes 5, spatulate-linear. Ovary densely tomentose or glabrous, 3-celled; ovules many per locule; style subulate; stigma truncate, slightly 3-lobed. Capsule cylindrical, 3-valved. Seeds many.

One species: China, Japan, Korea.

1. *Corchoropsis crenata* Siebold & Zuccarini, Abh. Math.-Phys. Cl. Königl. Bayer. Akad. Wiss. 3(2): 737. 1843.

田麻 tian ma

Annual herbs, to 1 m tall; stems and branches stellate pilose. Stipules subulate, 2–4 mm, caducous; petiole 0.2–2.3 cm, hairy; leaf blade ovate or narrowly ovate, 2.5–6(–8) × 1–3(–4.5) cm, papery or membranous, both surfaces densely stellate pubescent, basal veins 3(–5), lateral veins 2–3 on each side of midrib, base rounded to shallowly cordate, margin crenate-dentate, apex acuminate. Pedicels slender, 1.5–3 cm. Sepals narrowly lanceolate, 5–8 mm, reflexed. Petals yellow, obovate, (3–)6–10 mm. Stamens (5–)10–15, in 5 groups of (1–)2–3, 1/2 as long as petals, recurved; staminodes 5, spatulate-linear, 7–10 mm, stiffly erect. Ovary densely tomentose or glabrous. Capsule narrowly cylindrical, 1.7–3(–4) × 0.2–0.3 cm, very densely to sparsely stellate hairy or glabrous. Seeds ovoid, less than 3 mm, obscurely transversely ridged. Fl. Apr–Jun, fr. autumn. $2n = 20$.

Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Liaoning, Shaanxi, Shandong, Shanxi, Sichuan, Zhejiang [Japan, Korea].

In FRPS (49(1): 81. 1989) this species was treated as *Corchoropsis tomentosa* Makino, based on *Corchorus tomentosus* Thunberg, but the latter name was nomenclaturally superfluous when published, and is therefore illegitimate, because in the protologue (Fl. Jap. 228. 1784)

Thunberg listed *C. hirsutus* Linnaeus as a synonym.

- 1a. Ovary densely tomentose; capsule very densely to sparsely hairy 1a. var. *crenata*
1b. Ovary and capsule glabrous 1b. var. *hupehensis*

1a. *Corchoropsis crenata* var. *crenata*

田麻(原变种) tian ma (yuan bian zhong)

Corchoropsis tomentosa Makino var. *micropetala* Y. T. Zhang; *C. tomentosa* var. *tomentoscarpa* P. L. Chiu & G. R. Zhong.

Ovary densely tomentose. Capsule very densely to sparsely hairy.

Anhui, Fujian, Gansu, Guangdong, Guangxi, Guizhou, Hebei, Henan, Hubei, Hunan, Jiangsu, Jiangxi, Shaanxi, Shanxi, Sichuan, Zhejiang [Japan, Korea].

Corchoropsis tomentosa var. *micropetala* was described as having much smaller flowers, with petals only ca. 3 mm, but otherwise fits here.

1b. *Corchoropsis crenata* var. *hupehensis* Pampanini, Nuovo Giorn. Bot. Ital., n.s., 17: 431. 1910.

光果田麻 guang guo tian ma

Corchoropsis psilocarpa Harms & Loesener; *C. tomentosa* var. *psilocarpa* (Harms & Loesener) C. Y. Wu & Y. Tang.

Ovary and capsule glabrous.

Anhui, Gansu, Hebei, Henan, Hubei, Jiangsu, Liaoning, Shandong [Korea].

Type material of *Corchoropsis crenata* var. *hupehensis* has not been seen, but, assuming that Pampanini placed it in the correct genus, the mention of a glabrous ovary and capsule clearly places it here, where it has priority over *C. tomentosa* var. *psilocarpa*.

17. PTEROSPERMUM Schreber, Gen. Pl. 2: 461. 1791, nom. cons.

翅子树属 *chi zi shu shu*

Trees or shrubs, stellate velutinous or scurfy and scaly. Leaves simple; stipules linear to palmately fimbriate, sometimes forming nectaries, caducous; petiole short; leaf blade lobed or not, leathery, base often oblique, margin entire or serrate, apex sometimes truncate; juvenile leaves sometimes much larger, petiole long, leaf blade often with peltate base and prominently palmately lobed. Inflorescence axillary, 1-flowered or cymose and 1–5-flowered. Flowers bisexual; epicalyx lobes usually 3, usually distant from calyx, entire, fimbriate, or palmately lobed, rarely absent, caducous. Calyx 5(or 6)-lobed, divided nearly to base, usually spreading to ± reflexed, caducous. Petals 5, white or yellow, often erect. Androgynophore present, very short, glabrous. Stamens 15, in 5 groups of 3 alternating with staminodes; filaments connate into tube, free at top; anthers 2-celled, cells parallel, connective pointed; staminodes 5, filiform, longer and thicker than filaments. Ovary 5-locular; ovules 4–22 per locule; style clavate or filiform; stigma longitudinally 5-grooved. Fruit a schizocarp, cylindric or ovoid, angular or rounded, usually woody, sometimes leathery, dehiscent into 5 loculicidal mericarps when mature. Seeds 2 to many per locule, with long, oblong, membranous wing; endosperm scanty or absent; cotyledons usually plicate, simple. $2n = 38$.

Between 18 and 40 species: tropical and subtropical Asia; nine species (five endemic) in China.

Sterculia peltata G. Don (Gen. Hist. 1: 517. 1831), based on material from China, has long petiolate 5-lobed peltate leaves that are abaxially puberulent and adaxially glabrous, and has stems and petioles with a white tomentum. The leaf form is much more suggestive of juvenile material of *Pterospermum* than a species of *Sterculia* but the white indumentum is difficult to match with the species known from China.

Key to flowering material (flowers not known for *Pterospermum yunnanense*)

- 1a. Leaf blade 24–34 × 14–29 cm; sepals to 9 cm 1. *P. acerifolium*
 1b. Leaf blade 4.5–18 × 1.5–11 cm; sepals 1.5–6.5 cm.
 2a. Petals obovate, ca. 2.8 cm wide 3. *P. kingtungense*
 2b. Petals linear to oblanceolate, 0.4–1.1 cm wide.
 3a. Leaf blade of mature trees very variable, usually oblique, lobes very irregular 2. *P. proteus*
 3b. Leaf blade of mature trees uniform, usually bilaterally symmetrical, entire or with apex regularly 3–5-lobed.
 4a. Leaf blade of mature trees broadest above middle, apex 3–5-lobed 4. *P. truncatolobatum*
 4b. Leaf blade of mature trees oblong, elliptic, or broadest at or below middle, apex not lobed.
 5a. Epicalyx lobes linear-divided; pedicel 3–5 cm 9. *P. lanceifolium*
 5b. Epicalyx lobes entire; pedicel to 1.5 cm.
 6a. Leaf blade base obtuse or truncate, rarely shallowly obliquely cordate; sepals 2.5–2.8 × ca. 0.4 cm 8. *P. heterophyllum*
 6b. Leaf blade base obliquely cordate or rounded; sepals 3.5–4.5 × 0.25–0.4 cm.
 7a. Leaf blade base obliquely cordate; sepals ca. 4.5 × 0.4 cm; androgynophore ca. 2 cm 6. *P. niveum*
 7b. Leaf blade base obliquely rounded; sepals ca. 3.5 × 0.25 cm; androgynophore ca. 0.8 cm 7. *P. menglunense*

Key to fruiting material (fruits not known for *Pterospermum kingtungense*)

- 1a. Capsule 3–6 cm.
 2a. Capsule apex 3–5 mm, beaked 2. *P. proteus*
 2b. Capsule apex obtuse.
 3a. Small trees, to 5 m tall; branchlets gray puberulent when young 5. *P. yunnanense*
 3b. Large trees, 20–25 m tall; branchlets yellow-brown pilose or velutinous.
 4a. Petiole 1–2 cm, leaf blade 7–15 × 3–10 cm; capsule stipe robust, 1–1.5 cm 8. *P. heterophyllum*
 4b. Petiole ca. 0.5 cm, leaf blade 5–9 × 2–3 cm; capsule stipe slender, 3–5 cm 9. *P. lanceifolium*
 1b. Capsule 8–15 cm.
 5a. Leaf blade 24–34 × 14–29 cm, base not oblique 1. *P. acerifolium*
 5b. Leaf blade 4.5–18 × 1.5–11 cm, base oblique.
 6a. Leaf blade apex truncate and 3–5-lobed; capsule prominently 5-angled, ca. 12 × 7 cm 4. *P. truncatolobatum*
 6b. Leaf blade apex acuminate or caudate; capsule rounded, 8–10 × ca. 3 cm.
 7a. Branchlets yellow stellate tomentose when young; capsule glabrous, apex beaked 6. *P. niveum*
 7b. Branchlets shortly gray-white woolly when young; capsule hairy, apex acute 7. *P. menglunense*

1. *Pterospermum acerifolium* Willdenow, Sp. Pl. 3: 729. 1800.

翅子树 *chi zi shu*

Big trees; bark smooth. Branchlets densely velutinous when young. Stipules linear; petiole robust, striate; leaf blade nearly orbicular or oblong, sometimes ± lobed, 24–34 × 14–29 cm, leathery, abaxially densely yellowish and gray stellate velutinous, adaxially sparsely hairy or glabrous, base cordate, margin entire or crenate, apex truncate, nearly rounded, or pointed; juvenile leaves palmately lobed, peltate. Flowers solitary, fragrant; epicalyx lobes fimbriate or palmately divided. Sepals linear-oblong, ca. 9 × 0.7 cm, abaxially densely yellow-brown stellate velutinous, adaxially white villous. Petals white, linear-oblong, slightly cuneate, slightly shorter than sepals, glabrous. Stamines clavate, hairy. Ovary oblong, 5-angular; ovules many per locule. Capsule woody, cylindrical, stipitate, obscurely 5-grooved, 10–15 × 5–5.5 cm, reddish brown velutinous, glabrescent, base tapering, apex rounded. Seeds many per locule, obliquely ovate, flat, wing large and thin, brown, smooth.

Forested slopes; 1200–1700 m. S Yunnan [Bangladesh, Bhutan, India, Laos, Malaysia, Myanmar, Nepal, Thailand].

Pterospermum acerifolium is grown as an ornamental.

2. *Pterospermum proteus* Burkill, Bull. Misc. Inform. Kew 1901: 138. 1901.

变叶翅子树 *bian ye chi zi shu*

Small trees or shrubs, to 6 m tall. Branchlets densely white and yellowish brown puberulent. Leaf blade variously shaped, nearly orbicular, or broadly oblong in outline, usually oblique, sometimes irregularly lobed, 5–11 × 2–5.5 cm, abaxially densely red-brown puberulent, adaxially red-brown puberulent and glabrescent, base shallowly obliquely cordate or peltate, margin entire or irregularly lobed, lobes obtuse or crenate, apex acuminate, obtuse, or truncate; juvenile leaves palmately 7-lobed, peltate. Flowers 1–4-fascicled; epicalyx lobes filiform, ca. 2 mm. Sepals linear, ca. 1.5 × 0.15 cm, abaxially densely reddish brown puberulent. Petals linear, 1–1.2 cm, veins 7 or 8. Stamens slightly shorter than petals, almost free; staminodes ca. 0.6 cm, hairy on upper part. Ovary ovoid, ca. 4 mm, densely hairy. Capsule ovoid or ovoid-cylindrical, 5-angular or slightly foveolate, 3–4 cm, densely red-brown stellate tomentose, apex with 3–5 mm beak. Seeds ca. 3 cm including wing.

• Open forests on limestone; 900–1700 m. S Yunnan.

3. *Pterospermum kingtungense* C. Y. Wu ex H. H. Hsue, Acta Phytotax. Sin. 15(1): 81. 1977.

景东翅子树 *jing dong chi zi shu*

Trees, to 12 m tall; bark brown. Branchlets dark brown puberulent. Stipules ovate, scalelike, entire, ca. 4 mm; petiole ca. 1 cm, densely brownish tomentose; leaf blade oblong-obovate in outline, usually irregularly lobed, 8–13.5 × 4.5–6 cm, leathery, abaxially densely yellowish white stellate tomentose, adaxially glabrous, base rounded, truncate, or shallowly cor-

date, apex irregularly 3–5-lobed, bluntly acuminate. Flowers solitary, ca. 7 cm in diam., nearly sessile; epicalyx lobes ovate, entire, hairy. Sepals linear to narrowly lanceolate, ca. 4.5 × 1.1 cm, abaxially densely dark brown tomentose, adaxially densely yellow-brown tomentose. Petals white, obliquely obovate, ca. 4.8 × 2.8 cm, stellate puberulent, especially at base, base clawed, apex rounded. Androgynophore ca. 6 mm; filaments glabrous, apex of connective pointed and caudate; staminodes linear-clavate, ca. 3.5 cm, glabrous, upper part densely verrucose. Ovary ovoid, densely yellowish brown tomentose; style hairy; stigmas free but twisted together. Capsule not seen.

• Forested valleys on limestone; 1400–1500 m. SW Yunnan (Jingdong).

Pterospermum kingtungense is easily distinguished from other species by its much broader, obliquely obovate petals, ca. 2.8 cm wide, with a rounded apex. It is classified as “Critically endangered” in the IUCN Red List because its very small population is in an unprotected area subject to regular cutting.

4. *Pterospermum truncatolobatum* Gagnepain, Notul. Syst. (Paris) 1: 84. 1909.

截裂翅子树 *jie lie chi zi shu*

Trees, to 16 m tall; bark black, striate. Branchlets densely yellow-brown stellate tomentose when young, becoming gray-white or yellowish gray stellate tomentose or nearly glabrous. Stipules palmately 3–5-fimbriate, densely hairy, caducous; petiole robust, 4–12 mm; leaf blade oblong-obovate in outline, usually irregularly lobed, 8–16 × 3.5–11 cm, leathery, abaxially densely gray-white or yellow-brown stellate tomentose, adaxially glabrous or minutely hairy along midrib, base cordate or obliquely cordate, apex truncate and 3–5-lobed, central lobe acute or acuminate, 1–2 cm. Flowers solitary, nearly sessile; epicalyx lobes fimbriate. Sepals linear, relatively thick, 4.5–6.5 × ca. 0.4 cm, abaxially densely brown tomentose, adaxially silvery white villous. Petals linear-falcate, 3–6 × 0.4–0.5 cm, base tapering. Stamens ca. 3.5 cm; staminodes filiform, ca. 5 cm, glabrous. Ovary ovoid, hairy. Fruiting pedicel to 8 mm; capsule woody, ovoid or ovoid-cylindrical, prominently 5-angular and 5-grooved, ca. 12 × 7 cm, densely brown stellate tomentose, verrucose or not, base narrowed into 2–3 × ca. 1 cm stipe. Seeds 6–10 per locule, in 2 rows, 4–5.5 cm including wing, wing linear, up to 4.4 cm, apex obtuse or truncate. Fl. Jul.

Dense forests on limestone; 300–500 m. SE Guangxi (Ningming, Longzhou), SE Yunnan (Jinping) [N Vietnam].

5. *Pterospermum yunnanense* H. H. Hsue, Acta Phytotax. Sin. 15(1): 81. 1977.

云南翅子树 *yun nan chi zi shu*

Small trees, to 5 m tall. Branchlets gray puberulent when young. Leaf blades dimorphic: those of young trees and coppiced branches with petiole up to 24 cm, blade palmately 5-divided, lobes nearly linear, ca. 16 × 11 cm, base peltate, apex acuminate; those of mature trees with petiole 1–1.5 cm, blade oblong-obovate in outline, usually irregularly lobed, 6.5–8.5 cm, leathery, abaxially densely yellowish brown stellate puber-

ulent, adaxially glabrous, base cordate or obliquely cordate, apex truncate with obtuse acumen; lateral veins 5–6 per side of midrib. Flowers unknown. Capsule ovoid-ellipsoid, obscurely 5-angular and with 5 nearly flat foveolate spots, ca. 4 cm, densely brown puberulent, base narrowed into ca. 6 mm stipe, apex obtuse. Seeds ca. 2.8 cm including wing, wing brown, apex obtuse.

• Forests on limestone cliffs and summit ridges; 1400–1600 m. S Yunnan.

Pterospermum yunnanense is classified as “Critically endangered” in the IUCN Red List because there are few mature individuals and regeneration is poor.

6. *Pterospermum niveum* S. Vidal, Revis. Pl. Vasc. Filip. 67. 1886.

台湾翅子树 tai wan chi zi shu

Pterospermum formosanum Matsumura.

Trees, to 20 m tall. Branchlets yellow stellate tomentose when young and glabrescent. Stipules lanceolate, ca. 8 mm; petiole 0.5–1 cm, gray-yellow velutinous; leaf blade oblong or oblong-lanceolate, 12–18 × 3.5–7 cm, abaxially densely gray-yellow velutinous, adaxially yellow velutinous near base of petiole, basal veins 5, impressed adaxially and prominently raised abaxially, base obliquely cordate, margin entire, apex acuminate or caudate. Flowers solitary, 5–7 cm in diam. Sepals linear-lanceolate, ca. 4.5 × 0.4 cm, abaxially yellow-brown velutinous, adaxially villous. Petals white, obovate, ca. 3.5 × 1.1 cm, apex obtuse. Stamines filiform. Ovary ovoid, densely tomentose; style glabrous; stigma 5-lobed. Capsule cylindrical, or cylindrical-ellipsoid, 8–10 × ca. 3 cm, glabrous, apex acute and beaked. Seeds 3–4 cm including wing, apex obtuse.

Lowland forests. S Taiwan [Philippines].

Pterospermum niveum is possibly conspecific with *P. celebicum* Miquel. The type of *P. formosanum* has not been seen but the type locality and protologue description strongly suggest that it belongs here.

The timber is valued commercially.

7. *Pterospermum menglunense* H. H. Hsue, Acta Phytotax. Sin. 15(1): 81. 1977.

勐仑翅子树 meng lun chi zi shu

Trees, to 12 m tall. Branchlets shortly gray-white woolly when young. Petiole 0.3–0.5 cm; leaf blade lanceolate or elliptic-lanceolate, 4.5–12.5 × 1.5–4.8 cm, thickly papery, abaxially densely yellowish brown stellate velutinous, adaxially glabrous or minutely sparsely puberulent, base obliquely rounded, apex long acuminate or caudate-acuminate. Flowers solitary, subterminal; pedicel ca. 0.5 cm; epicalyx lobes long-pointed, entire, ca. 6 mm. Sepals linear, 3.5–3.8 × ca. 0.25 cm, abaxially densely yellow-brown stellate tomentose, adaxially glabrous. Petals white, obovate, ca. 3 × 0.8 cm, glabrous, base tapering into narrow stalk, apex obtuse with acumen. Androgynophore ca. 8 mm, glabrous. Stamens slightly shorter than staminodes; staminodes ca. 1 cm, glabrous. Ovary ovoid, ca. 4 mm, densely yellowish brown tomentose. Capsule narrowly ellipsoid, ca. 8

cm, base tapering into 1–2 cm stipe, apex acute. Seeds ca. 3.5 cm including wing. Fl. Apr.

• Monsoon forests on limestone hills. S Yunnan (Xishuangbanna).

Pterospermum menglunense, though found within a protected area, is still treated as “Critically endangered” in the IUCN Red List because of the very small, fragmented population.

8. *Pterospermum heterophyllum* Hance, J. Bot. 6: 112. 1868.

翻白叶树 fan bai ye shu

Pterospermum levinei Merrill.

Trees, to 20 m tall; bark gray or gray-brown. Branchlets yellow-brown pilose. Petiole 1–2 cm, hairy; leaf blade oblong-ovate to oblong, 7–15 × 3–10 cm, abaxially densely yellow-brown stellate pubescent, adaxially nearly glabrous; base obtuse, truncate or obliquely cordate, apex acute or acuminate; juvenile and coppice leaves: petiole ca. 12 cm, leaf blade palmately 3–5-lobed, ca. 15 cm in diam., base conspicuously petate, truncate or slightly rounded. Flowers solitary or in cymes of 2–4; pedicel 0.5–1.5 cm; epicalyx lobes closely adnate to calyx, scalelike. Sepals linear, up to 2.8 × 0.4 cm, both surfaces puberulent. Petals greenish white, oblanceolate, as long as sepals. Androgynophore ca. 2.5 mm; staminodes filiform, slightly longer than stamens. Ovary ovoid, villous; style glabrous. Capsule woody, cylindrical-ovoid, ca. 6 × 2–2.5 cm, yellow tomentose, base tapering into robust, 1–1.5 cm stipe, apex obtuse. Fl. autumn.

• Fujian, Guangdong, Guangxi, Hainan.

The roots of *Pterospermum heterophyllum* are of medicinal use. The epithet refers to the great contrast in form between juvenile and mature leaves but this is not unique to this species.

9. *Pterospermum lanceifolium* Roxburgh, Fl. Ind., ed. 1832, 3: 163. 1832 [“*lanceaeifolium*”].

窄叶半枫荷 zhai ye ban feng he

Trees, to 25 m tall; bark yellow-brown or gray, striate. Branchlets yellow-brown velutinous when young. Stipules 2–3-fimbriate, velutinous, longer than petiole; petiole ca. 0.5 cm; leaf blade lanceolate or oblong-lanceolate, 5–9 × 2–3 cm, abaxially densely yellow-brown or yellow-white velutinous, adaxially glabrous, base oblique or obtuse, margins entire or with several teeth near apex, apex acuminate or acute. Flowers solitary; pedicels 3–5 cm, articulate, velutinous; epicalyx lobes at middle of pedicel, 4- or 5-fimbriate or linear, 7–8 mm. Sepals linear, ca. 2 × 0.3 cm, both surfaces puberulent. Petals white, lanceolate, as long as sepals or slightly shorter, apex obtuse. Stamines filiform, longer than stamens, basally villous. Ovary puberulent. Capsule woody, cylindrical-ovoid, ca. 5 × 2 cm, yellow-brown tomentose, base tapering into slender, 3–5 cm stipe, apex obtuse. Seeds 2–4 per locule, 2–2.5 cm including wing. Fl. spring and summer.

Dense or open forests, slopes, valleys; 800–900 m. Guangdong, SW Guangxi, S Yunnan [India, Malaysia, Myanmar, Vietnam].

18. PARADOMBEYA Stapf, Hooker's Icon. Pl. 28: t. 2743a. 1902.

平当树属 ping dang shu shu

Small trees or shrubs. Leaves alternate, serrulate; stipule filiform, caducous. Inflorescence axillary, fascicled, sometimes umbel-like; pedicels articulate; epicalyx lobes 2 or 3, verticillate, near joint. Calyx 5-partite nearly to base; sepals valvate, glabrous. Petals yellow, broadly ovate, unequal, persistent, apex truncate. Stamens 15, in 5 groups of 3, alternating with 5 tongue-shaped staminodes; filaments connate at base into short tube; anthers ovate or elliptic. Ovary sessile, 2–5-loculed, stellate puberulent, cells easily dehiscent; ovules 2 per locule; style elongate, slightly swollen upward, usually 4–5-grooved. Fruit a capsule, nearly globose, locules easily freed from each other, stellate puberulent. Seeds 1 per cell, oblong-ovoid, dark brown.

Two species: China, Myanmar, Thailand; one species (endemic) in China.

1. Paradombeya sinensis Dunn, Hooker's Icon. Pl. 28: t. 2743b. 1902.

平当树 ping dang shu

Paradombeya rehderiana Hu; *P. szechuenica* Hu.

Small trees or shrubs, up to 5 m tall. Branchlets slender, sparsely stellate puberulent. Petiole 3–5 mm or leaf sessile; leaf blade ovate-lanceolate to elliptic-ob lanceolate, 5–12.5 × 1.5–5 cm, membranous, abaxially sparsely stellate hairy, adaxially glabrous or nearly so, basal veins 3, lateral veins ca. 10 on each side of midrib, base rounded or shallowly cordate, margin

densely serrulate, apex long acuminate. Inflorescence a fascicle of 1–3 umbel-like cymes, each 1–6-flowered; pedicels slender, 1–1.5 cm; epicalyx lobes 3, lanceolate, caducous. Calyx lobes ovate-lanceolate, ca. 4 mm. Petals yellow, broadly obovate, unequal to each other, ca. 5 mm, apex truncate, persistent. Staminodes tongue-shaped, slightly shorter than petals. Ovary globose, 2-loculed, densely stellate tomentose; style subulate, glabrous. Capsule nearly globose, ca. 2.5 mm. Seeds dark brown, oblong-ovoid, ca. 1.5 mm.

• Open scrub on grassy slopes; 300–1500 m. S and SW Sichuan, Yunnan.

19. MELHANIA Forsskål, Fl. Aegypt.-Arab. 64. 1775.

梅蓝属 mei lan shu

Small shrubs or herbs. Leaves simple, hairy, margin serrate. Flowers axillary, solitary or in short racemes. Epicalyx lobes (2 or)3, cordate or reniform, usually longer than sepals, persistent. Calyx 5-divided. Petals 5, enclosing ovary and persistent. Filament tube cup-shaped, very short; 5 tongue-shaped staminodes alternating with 5 stamens. Ovary sessile, 5-loculed; ovules 1 to many per locule; style subulately 5-branched. Capsule 5, dehiscent. Seeds with endosperm; cotyledons plicate, 2-lobed at apex.

About 60 species: primarily in Africa, C Asia, Australia, and Madagascar; one species in China.

1. Melhania hamiltoniana Wallich, Pl. Asiat. Rar. 1: 69. 1830.

梅蓝 mei lan

Small shrubs, up to 1 m tall. Branchlets densely yellowish brown puberulent. Stipules linear pointed, very tiny, ca. 4 mm, much shorter than petiole, caducous; petiole 1–1.5 cm, densely yellowish brown puberulent; leaf blade broadly ovate or elliptic-ovate, 2.5–4 × 1.5–3 cm, both surfaces densely puberulent, abaxially white-gray, base rounded or shallowly cordate, margin serrulate, apex obtuse. Inflorescence axillary, shortly racemose, up to 5 cm, usually longer than leaves, densely puberulent, usually 3–5-flowered; pedicel ca. 6 mm. Epicalyx lobes 2 or 3, ovate, ca. 6 mm, densely puberulent, base narrow, adnate

to lower part of calyx, margin slightly reflexed. Calyx lobes lanceolate, 8–9 mm, apex acute. Petals yellow, obovate-triangular, ca. 1 cm, longer than calyx, apex truncate. Staminodes 5, tongue-shaped, connate at base, ca. 8 mm, alternating with stamens, much longer than stamens. Ovary ovoid, ca. 2.5 mm, puberulent; ovules 3 or 4 per locule; style ca. 2 mm; stigma lobes curved outward, puberulent. Capsule ovoid, ca. 7 mm, apex obtuse, enclosed by persistent sepals and bracteoles, dehiscent. Seeds 2–3 in each locule, black-brown, elliptic, ca. 2 mm.

Grassy slopes; 400–500 m. S Yunnan (Yuanjiang) [India, Myanmar].