

STYRACACEAE

安息香科 an xi xiang ke

Hwang Shu-mei¹; James Grimes²

Trees or shrubs, usually stellate pubescent or scaly, rarely glabrous. Leaves usually alternate, simple; stipules absent or very minute. Inflorescences terminal or axillary, racemes, panicles, or cymes, rarely 1-flowered or in several-flowered fascicles; bracteoles minute or absent. Flowers bisexual, rarely polygamodioecious, actinomorphic. Calyx campanulate, obconical, or cupular; tube completely or partially adnate to ovary; teeth or lobes 4 or 5 (or 6), sometimes very small or obsolete. Corolla mostly white, gamopetalous; lobes (4 or 5) (–7), basally ± connate, rarely free, imbricate or valvate, rarely slightly induplicate. Stamens 2 × or sometimes as many as corolla lobes, inserted at base of corolla; filaments mostly flattened, partially or completely connate at base into a tube; anthers introrse, 2-locular, opening by longitudinal slits. Ovary superior, half-inferior, or inferior, 3–5-locular or apically 1-locular and basally 3–5-locular; ovules few or 1 in each locule, erect, pendulous, or anatropous, integuments 1 or 2; placentation axile or parietal. Style slender, linear or subulate; stigma truncate, capitate or 2–5-lobed. Fruit a berry, drupe, or capsule, exocarp fleshy to dry. Seeds sometimes winged, often with a broad hilum; embryo straight or slightly curved; endosperm copious; cotyledons flattened or subterete.

Eleven genera and ca. 180 species: tropical and temperate America, Asia, and Mediterranean; 10 genera (two endemic) and 54 species (32 endemic) in China.

Hwang Shu-mei in Wu Young-fen & Hwang Shu-mei, eds. 1987. *Styracaceae*. Fl. Reipubl. Popularis Sin. 60(2): 77–150.

- 1a. Fruit completely separate from or slightly adnate to persistent calyx; ovary superior.
 - 2a. Ovary 3-locular when young, becoming 1-locular; seeds 1 or 2, without wings, rounded at both ends; pedicel not jointed 1. *Styrax*
 - 2b. Ovary 5 (or 6)-locular; seeds numerous, winged or acute at both ends; pedicel jointed.
 - 3a. Filaments coherent or slightly connate at base; fruit drupaceous, indehiscent, pyriform; seeds pointed at both ends 2. *Bruinsmia*
 - 3b. Filaments connate at least to middle; fruit capsular dehiscent loculicidally by 5 valves; seeds winged at both ends 3. *Alniphyllum*
- 1b. Fruit partially or almost completely adnate to persistent calyx; ovary inferior.
 - 4a. Fruit dehiscent loculicidally by 3 valves; seeds winged at both ends; petals free, connective 2- or 3-dentate 4. *Huodendron*
 - 4b. Fruit indehiscent; seeds without wings; petals connate at base (short coherent in *Pterostyrax*), connective entire.
 - 5a. Corolla lobes 4 (or 5); fruit 2–4-winged 5. *Halesia*
 - 5b. Corolla lobes 5 (4–7 in *Sinojackia*); fruit with 5–12 ribs or wings (*Parastyrax* without ribs or wings).
 - 6a. Flowers 1 or 2 together; filaments of equal length 6. *Melliodendron*
 - 6b. Flowers in racemes, panicles, or thyrses; filaments 5 long and 5 short or subequal (sometimes equal in *Sinojackia*).
 - 7a. Leaf blade margin entire or callose-denticulate; inflorescences crowded 10. *Parastyrax*
 - 7b. Leaf blade margin serrate or serrulate; inflorescences not crowded.
 - 8a. Winter buds enclosed by scales; fruit apex with a short point 9. *Rehderodendron*
 - 8b. Winter buds naked; fruit apex tapering into a beak.
 - 9a. Inflorescences paniculate; calyx tube campanulate; fruit exocarp thin, crusty 7. *Pterostyrax*
 - 9b. Inflorescences racemose cymes; calyx tube obconical; fruit exocarp thick, woody or fleshy 8. *Sinojackia*

1. STYRAX Linnaeus, Sp. Pl. 1: 444. 1753.

安息香属 an xi xiang shu

Cyrta Loureiro.

Trees or shrubs, stellate pubescent or scaly, rarely glabrous. Leaves usually alternate. Inflorescences axillary or terminal, racemes, panicles, or cymes, sometimes 1-flowered or in several-flowered fascicles; bracteoles small, early deciduous. Flowers

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bisexual. Calyx cupular, 5-toothed, rarely truncate or 2–6-lobed. Corolla campanulate; lobes 5(–7), imbricate or valvate. Stamens (8–)10(–13), equal or rarely unequal in length; filaments flattened, free, sometimes basally adnate to corolla; anthers oblong. Ovary superior, 3-locular when young, becoming 1-locular; ovules 1–4 per locule; placentation parietal. Style subulate or filiform; stigma capitate or 3-lobed. Fruit indehiscent or 3-valved dehiscent, exocarp fleshy to dry. Seeds 1(or 2); seed coat almost bony, with a large basal hilum; endosperm fleshy or almost bony; embryo straight.

About 130 species: E Asia, North and South America, Mediterranean; 31 species in China.

- 1a. Corolla lobe margin usually narrowly involute, valvate or induplicate.
- 2a. Calyx and pedicel glabrous 19. *S. wuyuanensis*
- 2b. Calyx and pedicel densely scaly or stellate pubescent.
- 3a. Leaf blade abaxially densely covered with silvery gray or brownish glossy scales 20. *S. argentifolius*
- 3b. Leaf blade abaxially glabrous or stellate tomentose.
- 4a. Leaf blade abaxially densely stellate tomentose.
- 5a. Petiole 1–3 mm; leaf blade abaxially densely grayish stellate tomentose, tertiary veins reticulate; fruit obovoid, ca. 6 mm in diam. 21. *S. calvescens*
- 5b. Petiole 10–30 mm; leaf blade abaxially densely brown or brownish stellate tomentose, tertiary veins subparallel; fruit ovoid-globose, globose, or subglobose, 10–22 mm in diam.
- 6a. Calyx teeth ovate-deltate, ca. 2 mm; leaf blade abaxially densely stellate tomentose but stellate pubescent on veins 22. *S. chinensis*
- 6b. Calyx teeth ± rudimentary, limb undulate, truncate, or subtruncate and less than 2 mm; leaf blade abaxially stellate tomentose.
- 7a. Leaf blade twice or more as long as wide, base cuneate; fruit ovoid-globose 25. *S. suberifolius*
- 7b. Leaf blade less than twice as long as wide, base rounded or broadly cuneate; fruit globose or compressed globose.
- 8a. Petiole 2–3 cm; leaf blade thick leathery, apex short acuminate 23. *S. hainanensis*
- 8b. Petiole 1–1.5 cm; leaf blade leathery, apex acuminate 24. *S. benzoides*
- 4b. Leaf blade abaxially glabrous or sparsely stellate pubescent.
- 9a. Fruit cylindrical to oblique ovoid or ellipsoid to ellipsoid-ovoid; filaments flexuous.
- 10a. Fruit cylindrical to oblique ovoid, 1.2–3 × 8–16 mm, apex rostrate to short pointed; leaf blade elliptic, oblong, or elliptic lanceolate, margin entire or irregularly denticulate 26. *S. agrestis*
- 10b. Fruit ellipsoid to ellipsoid-ovoid, 8–16 × 6–8 mm, apex acute or apiculate; leaf blade ovate, oblong, or ovate-lanceolate, margin serrate or rarely entire 27. *S. serrulatus*
- 9b. Fruit subglobose, globose, ovoid, or obovoid; filaments straight.
- 11a. Trees; leaf blade leathery or subleathery; inflorescences (3–)5-flowered or more.
- 12a. Inflorescences racemose; fruit 8–15 mm in diam. 28. *S. confusus*
- 12b. Inflorescences paniculate; fruit 5–7 mm in diam. 29. *S. dasyanthus*
- 11b. Shrubs; leaf blade papery; inflorescences to 5-flowered.
- 13a. Calyx 2.5–3 mm; fruit irregularly rugose 30. *S. formosanus*
- 13b. Calyx 4–5 mm; fruit smooth 31. *S. faberi*
- 1b. Corolla lobe margin plane, imbricate.
- 14a. Leaf blade abaxially densely stellate tomentose.
- 15a. Branchlets with a pair of opposite leaves at base; inflorescences well-defined 6–15 cm racemes, sometimes with 1–3 lateral racemes from near base.
- 16a. Petiole forming a broad sheath at base to enclose winter buds; leaf blade subrounded to broadly elliptic 1. *S. obassis*
- 16b. Petiole without a broad sheath at base; leaf blade elliptic to elliptic-oblong 2. *S. huanus*
- 15b. Leaves never opposite; inflorescences irregular panicles with cymose branches or if unbranched and racemelike then 6 cm or less (sometimes to 10 cm in *S. tonkinensis*).
- 17a. Seeds densely tuberculate, stellate pubescent; inflorescences racemes, 3–10 cm 3. *S. tonkinensis*
- 17b. Seeds smooth or rugose, glabrous; inflorescences often paniculate, to 6 cm.
- 18a. Leaf blade 1–2.5(–4) × 0.7–2(–2.6) cm, margin 2–4-lobed or apically coarsely serrate; calyx 2–3 mm 4. *S. wilsonii*
- 18b. Leaf blade 3.5–8.5(–9.5) × 2–4.5 cm, margin entire or finely serrate to serrulate, never lobed; calyx 4.5–7 mm.
- 19a. Bracteoles linear, 6–12 mm; leaf blade adaxially usually rugose; fruit ca. 8 mm in diam. 5. *S. rugosus*
- 19b. Bracteoles subulate, 3–4 mm; leaf blade adaxially not rugose or sometimes slightly rugose when young (adaxially rugose in *S. perkinsiae*); fruit 10–15 mm

- in diam.
- 20a. Branchlets and abaxial surface of leaves including veins densely brownish stellate tomentose and short pubescent; leaf blade elliptic to obovate 6. *S. limprichtii*
- 20b. Branchlets and abaxial surface of leaves densely gray stellate tomentose but not short pubescent; leaf blade ovate, ovate-elliptic, or elliptic-lanceolate 7. *S. perkinsiae*
- 14b. Leaf blade abaxially glabrous or sparsely stellate pubescent.
- 21a. Leaves at least some subopposite, either a pair at base of each new shoot or near apex of branchlets.
- 22a. Leaf blade coarsely serrate to 3–5-lobed; calyx teeth 4–5 mm, lanceolate; stamens alternately differing in length 10. *S. supaii*
- 22b. Leaf blade entire, subentire, denticulate, or serrate; calyx teeth less than 3 mm, triangular or subulate; stamens ± equal in length.
- 23a. Inflorescences 8–10-flowered; petiole 7–15 mm 11. *S. hemsleyanus*
- 23b. Inflorescences 1-flowered; petiole less than 7 mm or absent.
- 24a. Fruit 2–2.5 cm in diam.; seeds glabrous 12. *S. macrocarpus*
- 24b. Fruit 1–1.2 cm in diam.; seeds sparsely stellate pubescent 13. *S. zhejiangensis*
- 21b. Leaves always alternate.
- 25a. Fruit densely golden-yellow stellate tomentose; leaf blade sparsely hirsute with both simple and stellate hairs 14. *S. chrysocarpus*
- 25b. Fruit densely gray, gray-yellow, or brownish stellate pubescent; leaf blade glabrous to stellate (mixed with simple hairs in *S. roseus*).
- 26a. Pedicel 2.5–5 cm, equal to or longer than subtended flower.
- 27a. Pedicel and calyx glabrous or (*S. japonicus* var. *calyconthrix*) sparsely stellate pubescent 8. *S. japonicus*
- 27b. Pedicel and calyx densely stellate tomentose 9. *S. grandiflorus*
- 26b. Pedicel 0.2–1.8 cm, often shorter than subtended flower.
- 28a. Seeds with scales; leaves yellowish when dried; filaments slightly flexuous at middle 15. *S. odoratissimus*
- 28b. Seeds glabrous; leaves brownish to dark green when dried; filaments not flexuous.
- 29a. Leaf blade base narrowly cuneate; fruit smooth when mature 16. *S. bashanensis*
- 29b. Leaf blade base rounded or broadly cuneate; fruit rugose when mature.
- 30a. Leaf blade ovate-lanceolate to oblong; petiole 5–10 mm; calyx yellow tomentose; corolla tube 3–4 mm; fruit obovoid-cylindric 17. *S. macranthus*
- 30b. Leaf blade elliptic to ovate-elliptic; petiole 3–5 mm; calyx yellow-brown to orange-red and tomentose to short pubescent; corolla tube ca. 2 mm; fruit subglobose 18. *S. roseus*

1. *Styrax obassis* Siebold & Zuccarini, Fl. Jap. 1: 93. 1839.

玉铃花 *yu ling hua*

Trees or shrubs 10–14 m tall. Trunk to 15 cm d.b.h. Branchlets slightly flattened, brown stellate pubescent, glabrescent. Leaves of 2 forms; basal 2 leaves of each branchlet opposite, petiole 3–5 mm, blade elliptic to ovate, 4.5–10 × 3–5 cm, apex rounded to acute; other leaves alternate, petiole 1–1.5 cm and forming a broad basal sheath enclosing winter buds, blade broadly elliptic, ovate, or rounded, 5–15 × 4–20 cm, base subrounded to broadly cuneate, apex acute to acuminate; all leaf blades papery, abaxially densely grayish stellate tomentose, adaxially glabrous except veins, margin coarsely serrate; secondary veins 5–8 per side, tertiary veins subparallel. Racemes terminal or axillary, 10–20-flowered, 6–15 cm, sometimes with 1 or 2 lateral racemes from base. Flowers slightly pendulous. Pedicel 3–5 mm. Calyx 4–5 mm, densely

gray-yellow tomentose; teeth 5 or 6, lanceolate to deltoid. Corolla white or rose, tube ca. 4 mm; lobes elliptic, 1.3–1.6 cm × 4–5 mm. Stamens shorter than corolla; filaments sparsely stellate villose, glabrescent. Style longer than stamens, glabrous. Fruit ovoid to subovoid, 1–1.5 cm in diam., densely yellow stellate tomentose. Seeds dark brown, oblong, smooth. Fl. Apr–Jul, fr. Aug–Nov.

Low wet forest on mountain slopes; 700–1500 m. Anhui, Hubei, Jiangxi, SE Liaoning, Shandong, Zhejiang [Japan, Korea].

2. *Styrax huanus* Rehder, J. Arnold Arbor. 11: 167. 1930.

墨泡 *mo pao*

Trees 6–15 m tall. Bark brown, irregularly fissured. Branchlets densely grayish yellow stellate pubescent. Winter buds conical, densely dark brown stellate pubescent. Petiole 1–2 cm; leaves of 2 forms; basal 2 leaves of each branchlet

opposite, blade oblong to oblong-ovate, 8–12 × 5.5–10 cm; other leaves alternate, blade elliptic to elliptic-oblong, 5–15 × 5.5–10 cm; all leaf blades abaxially densely gray stellate tomentose, adaxially glabrous except veins, base cuneate to broadly cuneate, margin serrate, apex acute; secondary veins 7–9 per side, tertiary veins subparallel. Racemes terminal or axillary, 6–15 cm, sometimes with 2 or 3 lateral racemes from near base. Flowers fragrant, pendulous. Pedicel 2–5 mm. Calyx campanulate, 4–6 mm, densely stellate tomentose; teeth 5 or 6, subulate, unequal. Corolla tube shorter than lobes; lobes obovate-elliptic to elliptic, 1–1.5 cm × 4.5–5 mm. Filaments slender, sparsely stellate pubescent. Style equal to corolla. Fruit ovoid, ca. 8 mm in diam., densely gray stellate tomentose, rugose, apex short pointed. Seeds brown, smooth. Fl. Apr–Jul, fr. Nov–Oct.

* Forests; 1200–1700 m. E Sichuan.

3. *Styrax tonkinensis* (Pierre) Craib ex Hartwich, *Apotheker-Zeitung* 28: 698. 1913.

越南安息香 yue nan an xi xiang

Anthostyrax tonkinensis Pierre, Fl. Forest. Cochinch. 4: t. 260. 1892; *Styrax hypoglaucus* Perkins; *S. macrothyrsus* Perkins; *S. subniveus* Merrill & Chun.

Trees 6–30 m tall. Trunk 8–60 cm d.b.h.; bark dark gray, irregularly divided. Branchlets stellate tomentose, glabrescent. Leaves alternate; petiole 0.5–1.5 cm; leaf blade elliptic to ovate, 5–18 × 4–10 cm, papery to leathery, abaxially densely gray to glaucous stellate pubescent, adaxially glabrous except for veins, base rounded to cuneate, margin entire or apically serrate, apex short acuminate; secondary veins 5 or 6 per side, tertiary veins subparallel. Racemes or panicles 3–10 cm. Flowers 1.2–2.5 cm. Pedicel 5–10 mm. Calyx cupular, 3–5 mm, truncate to 5-toothed. Corolla tube 3–4 mm; lobes ovate-lanceolate, 1–1.6 cm × 3–4 mm, membranous. Filaments sparsely white stellate pubescent; anthers narrowly oblong. Style ca. 1.5 cm, glabrous. Fruit subglobose, 1–1.2 cm in diam., densely gray stellate tomentose, apex apiculate to obtuse. Seeds chestnut brown, ovoid, densely tuberculate, stellate tomentose and pubescent. Fl. May–Jun, fr. Aug–Oct.

Mixed forests; 100–2000 m. Fujian, Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Yunnan [Cambodia, Laos, Thailand, Vietnam].

4. *Styrax wilsonii* Rehder in Sargent, Pl. Wilson. 1: 293. 1912.

小叶安息香 xiao ye an xi xiang

Shrubs 1–2 m tall, many branched. Branchlets densely chestnut brown stellate pubescent, glabrescent. Leaves alternate; petiole 1–2 mm; leaf blade obovate, rhomboid, or rarely elliptic-ovate, 1–2.5(–4) × 0.7–2(–2.6) cm, papery, abaxially densely grayish stellate tomentose, adaxially rugose and glabrous except veins, base rounded to broadly cuneate, margin 2–4-lobed or apically coarsely serrate, apex acute; secondary veins 4–6 per side. Racemes terminal, 3–5-flowered, 2–3 cm. Flowers 1–1.3 cm. Pedicel 2–3 mm. Calyx cupular, 2–3 × ca. 3.5 mm, densely stellate tomentose. Corolla 6–7 × 3.5–4 mm;

lobes 5(or 6), oblong, yellowish stellate pubescent. Stamens 10(–12), included; filaments apically stellate pubescent; anthers linear-oblong, glabrous or stellate pubescent. Style slightly exerted. Fruit subglobose, 5–7 mm in diam., densely tomentose, apex short pointed. Seeds brown, ovoid to globose, glabrous. Fl. Apr–Jul, fr. Aug–Oct.

* Openings in forests or scrub; 1300–1700 m. Sichuan (Baoping Xian).

5. *Styrax rugosus* Kurz, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 40(2): 61. 1871.

皱叶安息香 zhou ye an xi xiang

Trees or shrubs, 1.5–6 m tall. Trunk to 18 cm d.b.h. Branchlets terete, densely stellate tomentose, becoming purple and glabrescent. Leaves alternate; petiole 2–3 mm; leaf blade ovate-oblong, ovate, or elliptic, 3.5–8.5 × 2–4.5 cm, papery, abaxially densely gray-yellow stellate tomentose and pubescent, adaxially rugose and with simple and 2- or 3-rayed to stellate hairs but glabrescent, base rounded to broadly cuneate, margin serrate or apically with unequal deltoid serrations, apex acuminate to rarely acute; secondary veins 4–7 per side, tertiary veins parallel. Racemes terminal, 3–6-flowered, 5–6 cm; bracteoles linear, 6–12 mm. Flowers ca. 1.6 cm. Pedicel 3–4 mm. Calyx ca. 4.5 × 3.5–5 mm, tube densely yellow-brown stellate tomentose; teeth lanceolate to subulate, 1.2–3 mm. Corolla tube 4–5 mm; lobes elliptic to obovate, 5–10 × 4–5 mm. Filaments white stellate villose. Fruit ovoid, ca. 8 mm in diam., irregularly rugose, densely yellow-brown stellate pubescent. Seeds 1 or 2, brown, ribbed, glabrous. Fl. Apr–Jun, fr. Sep–Nov.

Forests; 1000–1500 m. S Yunnan [India, Myanmar].

6. *Styrax limprichtii* Lingelsheim & Borza, Repert. Spec. Nov. Regni Veg. 13: 386. 1914.

楚雄安息香 chu xiong an xi xiang

Styrax langkongensis W.W. Smith.

Shrubs 1–2.5 m tall. Branchlets densely grayish stellate tomentose. Leaves alternate; petiole 1–3 mm; leaf blade elliptic to obovate, 3.5–7(–9.5) × 2–4.5 cm, papery, abaxially densely brownish stellate tomentose and short pubescent, adaxially stellate pubescent when young, base rounded to broadly cuneate, margin apically serrulate, apex acute to short acuminate; secondary veins 5 or 6 per side, tertiary veins reticulate. Racemes terminal, 3–6-flowered, 3–4 cm; bracteoles subulate. Flowers ca. 1.5 cm. Pedicel 3–4 mm. Calyx ca. 5 × 7 mm, densely yellow-brown stellate tomentose and villose; teeth subulate to deltoid, unequal, 1–1.5 mm. Corolla tube ca. 4 mm; lobes elliptic to ovate-elliptic, 0.9–1.1 cm × 4–6 mm. Filaments apical free parts densely white stellate villose. Fruit globose, 1–1.5 cm in diam., irregularly splitting into 3-valves, rugose, densely grayish stellate pubescent, apex short pointed. Seeds brown, ovoid, glabrous. Fl. Mar–Apr, fr. Aug–Oct.

* Forests; 1700–2400 m. SY Sichuan, NW Yunnan.

7. *Styrax perkinsiae* Rehder in Sargent, Pl. Wilson. 1: 292. 1912.

瓦山安息香 wa shan an xi xiang

Styrax shweliensis W.W. Smith.

Trees or shrubs, 2–6(–10) m tall. Trunk to 25 cm d.b.h. Branchlets terete, purple-brown. Leaves alternate; petiole 3–5 mm; leaf blade ovate, ovate-elliptic, or elliptic-lanceolate, 5–8 × 3–5 cm, papery, abaxially densely pale gray stellate tomentose and with sparse yellow-brown stellate hairs on veins, adaxially rugose and with simple or 2- or 3-rayed to stellate hairs or glabrescent, base rounded to broadly cuneate, margin entire or serrulate, apex short acuminate to acute; secondary veins 5 or 6 per side, tertiary veins subparallel. Racemes terminal, 3- or 4-flowered, 4–6 cm; bracteoles subulate. Flowers ca. 2 cm. Pedicel 5–9 mm. Calyx ca. 5 mm, densely yellow-brown to chestnut brown tomentose; teeth 5, irregularly subulate, ca. 1.5 mm. Corolla tube ca. 3 mm; lobes elliptic to obovate-elliptic, 1.4–1.6 cm × 5–6 mm. Filaments white stellate villose. Fruit ovoid, ca. 1.2 × 1 cm, apex short pointed. Seeds 1 or 2, brown, smooth. Fl. Mar–Apr, fr. Jul–Aug.

* Moist slopes in evergreen broad-leaved forests; 500–2500 m. S Sichuan, N Yunnan.

8. *Styrax japonicus* Siebold & Zuccarini, Fl. Jap. 1: 53. 1837–38.

野茉莉 ye mo li

Shrubs or small trees, 4–8(–10) m tall. Branchlets purple, slightly flattened, becoming terete. Leaves alternate; petiole 5–10 mm; leaf blade elliptic, oblong-elliptic, or ovate-elliptic, 4–10 × 2–5(–6) cm, papery to almost leathery, glabrous except for veins or vein axils, base cuneate to broadly cuneate, margin entire or apically remotely serrate, apex acute to short acuminate; secondary veins 5–7 per side, tertiary veins reticulate, conspicuously raised on both surfaces, sparsely stellate pubescent. Racemes terminal, 5–8 cm, 5–8-flowered. Flowers 2–2.8(–3) cm, slightly pendulous. Pedicel slender, 2.5–3.5 cm, glabrous or sparsely stellate pubescent. Calyx 4–5 × 3–5 mm, membranous, glabrous or sparsely stellate pubescent, teeth irregular. Corolla tube 3–5 mm; lobes ovate, obovate, or elliptic, 1.6–2.5 × 5–7(–9) mm. Stamens shorter than corolla; filaments slightly expanded, apical free parts white villose. Fruit ovoid, 0.8–1.4 × 0.8–1 cm, irregularly rugose, densely gray stellate tomentose, apex short pointed. Seeds brown, conspicuously rugose. Fl. Apr–Jul, fr. Sep–Dec.

400–1800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang [Japan, Korea].

- 1a. Calyx and pedicel glabrous 8a. var. *japonicus*
1b. Calyx and pedicel sparsely stellate
pubescent 8b. var. *calycothrix*

8a. *Styrax japonicus* var. *japonicus*

野茉莉 (原变种) ye mo li (yuan bian zhong)

Cyrta japonica (Siebold & Zuccarini) Miers; *Styrax bodinieri* H. Léveillé.

Calyx and pedicel glabrous. Fl. Apr–Jul, fr. Sep–Nov.

Forested slopes; 400–1800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hebei, Henan, Hunan, Jiangsu, Jiangxi, Shaanxi, Shandong, Shanxi, Sichuan, Yunnan, Zhejiang [Japan, Korea].

8b. *Styrax japonicus* var. *calycothrix* Gilg, Bot. Jahrb. Syst. 34(Beibl. 75): 58. 1940.

毛萼野茉莉 mao e ye mo li

Calyx and pedicel sparsely stellate pubescent. Fl. Apr–May, fr. Sep–Dec.

* Forests; 500–1000 m. Guizhou (Qingzhen Xian), Shangdong (Laoshan Xian), Yunnan.

9. *Styrax grandiflorus* Griffith, Not. Pl. Asiat. 4: 287. 1854.

大花安息香 da hua an xi xiang

Styrax cavaleriei H. Léveillé; *S. duclouxii* Perkins; *S. hookeri* C. B. Clarke var. *yunnanensis* Perkins; *S. japonicus* Siebold & Zuccarini var. *kotoensis* (Hayata) Masamune & Suzuki; *S. kotoensis* Hayata; *S. touchanensis* H. Léveillé.

Shrubs or small trees 4–7 m tall. Trunk to 30 cm d.b.h.; bark gray. Branchlets subterete, yellow-brown stellate pubescent. Leaves alternate; petiole 3–7 mm; leaf blade elliptic-ovate to oblong, 3–7(–9) × 2–4 cm, sparsely stellate pubescent or glabrous except for veins, base cuneate to broadly cuneate, margin entire or apically remotely serrulate, apex acute secondary veins 5–7 per side, tertiary veins reticulate. Racemes terminal, 3–9-flowered, 3–4 cm. Flowers 1.5–2.5(–3) cm. Pedicel 2.5–5 cm, densely stellate tomentose. Calyx ca. 7 × 5 mm, membranous, truncate to obscurely 5-toothed, densely gray-yellow stellate tomentose. Corolla tube 3–5 mm; lobes ovate-oblong to elliptic, 1.2–2 cm × 4–6 mm. Stamens 10(or 11), included; filaments basally white villose; anthers oblong, slightly stellate pubescent. Style shorter or equal to corolla. Fruit ovoid, 1–1.5 × 0.8–1 cm, 3-valved, dehiscent, densely gray-yellow stellate tomentose, rugose when dry, apex apiculate. Seeds 1 or 2, brown, ovoid, deeply rugose. Fl. Apr–Jun, fr. Aug–Oct.

Forest thickets, on mountain slopes or in ravines; 1000–2100 m. Guangdong, Guangxi, Guizhou, Taiwan, Xizang, Yunnan [Bhutan, India, Japan (Ryukyu Islands), Myanmar, Nepal, Sikkim]

10. *Styrax supaii* Chun & F. Chun, Sunyatsenia 3: 34. 1935.

裂叶安息香 lie ye an xi xiang

Shrubs or small trees, 2–6 m tall. Trunk to 10 cm d.b.h., bark brown, exfoliating. Branchlets terete, brown to dark brown stellate pubescent and sparsely villose. Leaves alternate but subopposite at base of branchlets; petiole 2–5 mm; leaf blade ovate to obovate, 4–8 × 2–5 mm, papery to leathery, abaxially sparsely stellate pubescent, adaxially with simple or with 2- or 3-rayed to stellate villose hairs when young, base rounded to broadly cuneate, margin coarsely serrate or 3–5 deeply dentate or lobed but opposite blades usually entire, apex

acute to acuminate; secondary veins 3–5 per side, tertiary veins reticulate, conspicuously raised. Racemes terminal, 2- or 3-flowered, 3–4 cm. Flowers 1.5–1.8 cm. Pedicel slender, 1–1.5 cm. Calyx obconical, ca. 1.2 cm × 4 mm, membranous; teeth lanceolate, 4–5 mm. Corolla tube ca. 3 mm; lobes elliptic-lanceolate, 1.4–1.5 cm × 4–5 mm. Stamens alternately differing in length; filaments basally densely white pubescent. Fruit ovoid, 1–1.2 cm × 7–9 mm, longitudinally rugose, densely white villous, apex apiculate to short beaked. Seeds brown, ovoid, smooth. Fl. Apr–May, fr. Jun–Sep.

* Forest edges, thickets; 300–900 m. N Guangdong, S Hunan.

11. *Styrax hemsleyanus* Diels, Bot. Jahrb. Syst. 29: 530. 1900.

老鸱铃 *lao gua ling*

Styrax hemsleyanus var. *griseus* Rehder.

Trees 5–12 m tall. Trunk to 12 cm d.b.h.; bark dark brown. Branchlets hairy or glabrous. Leaves alternate but subopposite on basal part of branchlets; petiole 0.7–1.5 cm; leaf blade oblong to ovate-oblong, 8–12 × 4–6 cm, papery, scabrous, sparsely gray-brown stellate pubescent on veins, gray-green to dark green when dry, base oblique and subrounded to broadly cuneate, margin serrate to subentire, apex slightly curved and acute to rarely acuminate; secondary veins 7–10 per side, tertiary veins reticulate. Racemes terminal, 8–10-flowered, 9–15 cm, usually basally 2- or 3-branched. Flowers 1.8–2.7 cm. Pedicel 2–4 mm, slightly curved. Calyx 4–8 × 3–6 mm; teeth 5, subulate to deltoid, unequal, 2–3 mm, apex brown glandular dotted. Corolla lobes elliptic to elliptic-obovate, ca. 1.5 cm × 5 mm, acute. Stamens shorter than corolla; filaments sparsely white stellate villose on free part. Fruit globose to ovoid, 0.8–1.3 × 1–1.5 cm, rugose, densely yellow-brown to gray-yellow stellate tomentose, apex apiculate. Seeds 1 or 2, brown, smooth or slightly rugose, glabrous. Fl. May–Jun, fr. Jul–Sep.

* Mountain slopes, forest edges; 300–900 m. Guizhou, Henan, Hubei, Hunan, Shaanxi, Sichuan.

12. *Styrax macrocarpus* Cheng, Contr. Biol. Lab. Chin. Assoc. Advancem. Sci., Sect. Bot. 10: 242. 1938.

大果安息香 *da guo an xi xiang*

Trees 6–9 m tall, deciduous. Branchlets terete, densely gray stellate pubescent, glabrescent. Leaves subopposite on basal part of branchlets, alternate or subopposite in apical part of branchlets; petiole very short; leaf blade elliptic to obovate-elliptic, 7–17 × 3.5–7.5 cm, papery, glabrous but veins stellate pubescent, base cuneate to broadly cuneate, margin entire or apically serrate, apex acute; secondary veins 7–10 per side, tertiary veins subparallel. Pedicel ca. 1 cm. Flowers solitary, axillary, opening before leaves, ca. 3.3 cm. Calyx 5–7 × 7–9 mm, membranous, subglabrous; teeth 5 or 6, deltoid. Corolla tube 3–4 mm; lobes 5–7, elliptic, ca. 2.2 cm × 9 mm. Stamens shorter than corolla; filaments basally densely white villose. Fruit ovoid to pyriform, 2–3 × 2–2.5 cm, densely gray to brownish stellate tomentose, apex short pointed. Seeds dark brown, irregularly deeply rugose. Fl. May–Jun, fr. Sep–Oct.

* Forest thickets, slopes, ravines; 500–800 m. Guangdong, Hunan.

13. *Styrax zhejiangensis* S. M. Hwang & L. L. Yu, Acta Bot. Austr. Sin. 1: 75. 1983.

浙江安息香 *zhe jiang an xi xiang*

Shrubs to 2 m tall. Branchlets subterete, brown to gray-brown, glabrous. Leaves alternate but 2 lowermost on branchlet subopposite; petiole very short; leaf blade broadly elliptic to ovate-oblong, 2.5–8 × 2–5 cm, papery, abaxially glabrous but veins sparsely stellate villose, adaxially glabrous, base broadly cuneate to rounded, margin denticulate to subentire, apex acute; secondary veins 6–8 per side, tertiary veins reticulate. Flowers unknown. Fruit solitary, axillary, 1.8–2 × 1–1.2 cm, densely grayish stellate villose, apex short pointed. Seeds ovoid-ellipsoid, irregularly rugose, sparsely white stellate villose. Fr. Jun.

* Thickets, along stream banks; ca. 900 m. Zhejiang (Jiande Xian).

14. *Styrax chrysocarpus* H. L. Li, J. Arnold Arbor. 25: 312. 1944.

黄果安息香 *huang guo an xi xiang*

Trees 7–20 m tall. Branchlets densely yellow stellate tomentose, sometimes glabrescent. Leaves alternate; petiole 5–8 mm; leaf blade oblong-ovate to oblong, 10–20 × 5.5–13 cm, papery, sparsely hirsute with simple and stellate hairs, base rounded, margin entire or serrate, apex acute to short acuminate; secondary veins 5–10 per side, tertiary veins reticulate. Flowers unknown. Inflorescences racemose, 3–5-fruited, ca. 1.8–1.2 cm, densely golden-yellow stellate tomentose to pubescent. Fruiting pedicel ca. 4 mm. Fruit ca. 6 mm in diam., with a persistent calyx, apex beaked. Fr. Jul.

* Forest ravines; ca. 1500 m. Yunnan (Pingbian Xian).

15. *Styrax odoratissimus* Champion ex Benth, Hooker's J. Bot. Kew Gard. Misc. 4: 304. 1852.

芬芳安息香 *fen fang an xi xiang*

Styrax prunifolius Perkins; *S. veitchiorum* Hemsley & E. H. Wilson.

Trees 4–10 m tall. Trunk to 20 cm; bark gray-brown, not exfoliating. Young twigs slightly flattened, becoming purple to dark purple, terete, glabrous. Leaves alternate; petiole 5–10 mm; leaf blade ovate to ovate-elliptic, 4–15 × 2–8 cm, leathery to papery, glabrous but abaxially sometimes veins densely brown stellate pubescent, base broadly cuneate to rounded, margin entire or remotely serrulate, apex acuminate to acute; secondary veins 6–9 per side, tertiary veins subparallel. Inflorescences terminal racemes or panicles, 5–8 cm, densely yellow stellate tomentose. Flowers 1.2–1.5 cm. Pedicel 1.5–1.8 cm. Calyx ca. 5 × 5 mm, membranous, truncate to undulate. Corolla lobes elliptic to obovate-elliptic, 0.9–1.1 cm × 4–5 mm, membranous. Stamens shorter than corolla; filaments slightly flexuous at middle, densely white stellate pubescent. Fruit subglobose, 8–10 mm in diam., densely gray-yellow stellate tomentose,

apex with a slightly curved beak. Seeds ovoid, tuberculate, densely brown scaly. Fl. Mar–Apr, fr. Jun–Sep.

* Damp shaded ravines, slopes in forest thickets; 600–1600 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Zhejiang.

16. *Styrax bashanensis* S. Z. Qu & K. Y. Wang, Bull. Bot. Res., Harbin 9(1): 27. 1989.

巴山安息香 *ba shan an xi xiang*

Trees 3–7 m tall. Trunk to 16 cm d.b.h.; bark dull brown. Branchlets hairy or glabrous. Leaves alternate; petiole 4–10 mm; leaf blade elliptic-lanceolate to ovate-lanceolate, 6–15 × 2–3.5 cm, almost leathery, sparsely white stellate pubescent, base narrowly cuneate, margin remotely serrulate, apex long acuminate; secondary veins 7–9 per side, tertiary veins reticulate. Racemes terminal, 4–8-flowered, and 2–4.5 cm, or axillary, 1–4-flowered, and 1–2.5 cm. Flowers 1.2–1.4 cm. Pedicel 6–10 mm. Calyx ca. 3 × 4 mm, densely stellate tomentose, teeth 5 or 6. Corolla lobes 4–6, long elliptic, 8–10 × 4–5 mm. Stamens shorter than corolla; filaments densely whitish stellate pubescent on free part. Fruit ovoid-cylindric, ca. 7 mm in diam., densely tomentose with gray-yellow stellate hairs, apex short rostrate. Seeds dark brown, rugose, glabrous. Fl. May–Jun, fr. Jul–Aug.

* Forested slopes; ca. 1000 m. Shaanxi.

17. *Styrax macranthus* Perkins, Bot. Jahrb. Syst. 31: 487. 1902.

禄春安息香 *lu chun an xi xiang*

Trees to 7 m tall. Branchlets slightly flattened to terete, densely yellowish stellate puberulent or glabrous. Winter buds conical. Leaves alternate; petiole 5–10 mm; leaf blade oblong to ovate-lanceolate, 8–12 × 3–4 cm, papery to almost leathery, sparsely brownish stellate pubescent or glabrous except for veins or veins axils, base slightly oblique and rounded to broadly cuneate, margin glandular serrulate and slightly revolute, apex acute; secondary veins 5–7 per side, tertiary veins subparallel. Racemes terminal, 3- or 4-flowered, 4–6 cm. Flowers 1.2–2.5 cm. Pedicel 0.8–1.5 cm. Calyx 3.5–6 × 4.5–5.5 mm, membranous, irregularly 5-toothed to undulate, densely yellow stellate tomentose. Corolla tube 3–4 mm; lobes obovate to obovate-elliptic, 0.8–1.6 cm × 5–10 mm. Stamens shorter than corolla; filaments apical half of free parts densely white stellate tomentose. Fruit obovoid-cylindric, 1.5–2.1–1.5 cm, longitudoinally rugose, with dense gray-yellow stellate hairs, apex short pointed. Fl. Apr–Jun, fr. Aug–Oct.

* Slopes and ravines, in forest thickets; 2000–2500 m. Guangxi, S Yunnan.

18. *Styrax roseus* Dunn, Bull. Misc. Inform. Kew 1911: 273. 1911.

粉花安息香 *fen hua an xi xiang*

Trees 4–8 m tall. Trunk to 8 cm d.b.h. Branchlets terete, brown to gray stellate puberulent, glabrescent. Leaves alternate;

petiole 3–5 mm; leaf blade elliptic to ovate-elliptic, 6–12 × 2–6 cm but sometimes apical leaf blade smaller, papery, pubescent with grayish simple and 2-radiate to stellate hairs but glabrescent, base oblique and broadly cuneate to rarely rounded, margin glandular serrulate, apex acuminate and slightly curved; secondary veins 5–7 per side, tertiary veins subparallel. Racemes, 2- or 3(or 4)-flowered, 3–5 cm, densely stellate pubescent. Pedicel 2–8 mm. Flowers 1.5–2.5 cm. Calyx 5–8 3–5(–7) mm, membranous, densely yellow-brown to orange-red stellate tomentose to short pubescent; teeth 5, often deeply 2- or 3-crenately divided after anthesis. Corolla tube ca. 2 mm; lobes obovate-elliptic, 1.2–1.5 cm × 5–8 mm. Stamens shorter than corolla; filaments basally slightly expanded, free part of basal half stellate. Fruit subglobose, 1.2–1.4 cm in diam., rugose when mature, densely gray and brownish stellate tomentose. Seeds 1 or 2, nearly smooth. Fl. Jul–Sep, fr. Sep–Dec.

* Forests; 1000–2300 m. Guizhou, Hubei, S Shaanxi, S Sichuan, SE Xizang, SW Yunnan.

19. *Styrax wuyuanensis* S. M. Hwang, Acta Phytotax. Sin. 18: 160. 1980.

婺源安息香 *wu yuan an xi xiang*

Shrubs 1.5–3 m tall. Branchlets terete, sparsely brown stellate pubescent. Leaves alternate or opposite on lowermost part of branchlet; petiole 2–5 mm; leaf blade elliptic to elliptic-pyriform, 3.5–6 × 1–3 cm, papery, glabrous but veins sparsely brown stellate pubescent, base broadly cuneate, margin remotely serrulate, apex acuminate to caudate-acuminate; secondary veins 3–5 per side, tertiary veins reticulate. Inflorescences reduced to either a raceme of 2 or 3 flowers at branch apex or to a single axillary flower. Pedicel slender, 1.5–2 cm, glabrous. Calyx brown, ca. 3 × 3.5 mm, membranous, glabrous; teeth 5 or 6, subulate. Corolla tube ca. 3 mm; lobes stellate tomentose. Stamens shorter than or equal to corolla; filaments free part basally whitish stellate villose. Fruit globose, ca. 1 cm in diam., 3-valved, dehiscent, apex short pointed. Seeds brown, ovoid, glabrous. Fl. Apr, fr. Aug.

* Damp and shady areas, forest thickets; ca. 2000 m. S Anhui, NE Jiangxi.

20. *Styrax argentifolius* H. L. Li, J. Arnold Arbor. 24: 371. 1934.

银叶安息香 *yin ye an xi xiang*

Trees 5–15 m tall. Trunk to 40 cm d.b.h.; bark gray to dark gray. Branchlets densely brown scaly. Leaves alternate; petiole 7–10 mm; leaf blade elliptic, ovate-lanceolate, or elliptic-lanceolate, 5–15 2.5–6 cm, leathery, abaxially densely covered with silver-gray to brownish glossy scales, adaxially glabrous and green to yellow-green when dry, base broadly cuneate to rounded, margin entire, apex acuminate; secondary veins 5–8 per side, tertiary veins subparallel. Inflorescences terminal or axillary, racemes or panicles, 3–9-flowered, 3–5 cm. Flowers 1.2–1.6 cm. Pedicel 1–2 mm. Calyx ca. 3 × 3.5 mm, truncate to obscurely 5-toothed. Corolla tube 5–7 mm; lobes 4 or 5,

lanceolate, 8–9 × 1.5–2 mm. Stamens shorter than corolla; filaments densely yellow-brown stellate pubescent. Fruit subglobose, ca. 2.5 cm in diam., irregularly rugose when mature, densely gray scaly and sparsely gold-yellow stellate pubescent, apex short beaked. Seeds brownish, glabrous. Fl. Apr–May, fr. Aug–Sep.

Ravines in dense forests; 500–1500 m. SW Guangxi, S Yunnan [Vietnam].

21. *Styrax calvescens* Perkins in Engler, Pflanzenz. IV. 241 (Heft 30): 32. 1907.

灰叶安息香 hui ye an xi xiang

Styrax dasyanthus Perkins var. *cinerascens* Rehder.

Shrubs or small trees, 5–15 m tall. Trunk to 15 cm d.b.h.; bark dark gray. Branchlets sparsely brownish stellate puberulent. Leaves alternate; petiole 1–3 mm; leaf blade elliptic, obovate, or elliptic-obovate, 3–8 × 1.5–4.5, almost leathery, abaxially densely gray stellate tomentose and pubescent, adaxially sparsely stellate pubescent but glabrescent, base subrounded, margin apically serrulate, apex acuminate to acute; secondary veins 6 or 7 per side, tertiary veins reticulate, conspicuously raised. Inflorescences terminal or axillary, many-flowered racemes or panicles, 3.5–9 cm. Flowers 1–1.5 cm. Pedicel 5–10 mm. Calyx 3–5 3–4 mm, leathery, densely gray-yellow stellate tomentose and pubescent; teeth 5, deltoid, to 1 mm. Corolla tube ca. 3 mm; lobes oblong, 8–10 × 2–2.5 mm. Stamens shorter than corolla; filaments slightly expanded, free parts basally stellate villose. Fruit obovoid, ca. 8 × 6 mm, densely gray-yellow stellate tomentose and pubescent, apex short pointed. Seeds brown, smooth, glabrous. Fl. May–Jun, fr. Jul–Aug.

* Forest edges on slopes; 500–1200 m. S Henan, W Hubei, Hunan, Jiangxi, Zhejiang.

22. *Styrax chinensis* Hu & S. Y. Liang, Acta Phytotax. Sin. 18: 230. 1980.

中华安息香 zhong hua an xi xiang

Trees 10–20 m tall. Branchlets subterete, densely yellow-brown stellate pubescent. Leaves alternate; petiole 1–1.5 cm, 4-angled; leaf blade oblong-elliptic to obovate-elliptic, 8–23 × 3–12 cm, leathery, abaxially densely gray-brown stellate tomentose, adaxially subglabrous, base rounded to broadly cuneate, margin entire, apex acute; secondary veins 7–12 per side, tertiary veins subparallel. Inflorescences terminal or axillary, racemes or panicles, 4–12 cm. Flowers 1.2–1.5 cm. Pedicel 1–3 mm. Calyx 6–7 × 6–7 mm, densely yellowish stellate tomentose; teeth 5, ovate-deltoid, ca. 2 mm. Corolla 1–1.2 cm × 2–3 mm, tube ca. 3 mm; lobes valvate or induplicate. Stamens longer than corolla; filaments expanded, free parts densely stellate pubescent. Fruit globose, ca. 1.8 cm in diam., indehiscent or 3-valved and dehiscent, densely tomentose and sparsely pubescent with gray stellate hairs, apex obtuse to short pointed. Seeds brown, globose, slightly rugose, glabrous. Fl. Apr–May, fr. Nov–Sep.

Dense forests; 300–1200 m. Guangxi, Yunnan [Laos].

23. *Styrax hainanensis* How, Fl. Hainan. 3: 576. 1974.

厚叶安息香 hou ye an xi xiang

Styrax pachyphyllum Merrill & Chun (1935), not Pilger (1901).

Trees 8–10 m tall. Branchlets subterete, densely dark brown to red-brown stellate pubescent. Leaves alternate; petiole 2–3 cm; leaf blade ovate, broadly ovate, or broadly elliptic, 7–13 × 4–9 cm, thick leathery, base rounded to broadly cuneate, margin entire or inconspicuously serrate, apex short acuminate; secondary veins 5–7 per side, tertiary veins subparallel. Racemes axillary, 2–8-flowered, 3–4 cm. Flowers 1.3–1.6 cm. Pedicel ca. 5 mm. Calyx ca. 6 × 7 mm, truncate to slightly undulate, densely dark brown stellate tomentose. Corolla tube ca. 4 mm; lobes oblong-lanceolate, 1–1.2 cm × 3–4 mm. Filaments expanded, densely stellate pubescent. Fruit subglobose to globose, 2–2.2 cm in diam., densely gray-yellow stellate pubescent, irregularly 3-valved, dehiscent. Seeds chestnut brown, smooth, glabrous. Fl. Mar–Apr, fr. Aug–Oct.

* Mixed forests; 200–500 m. Hainan (Yaxian Xian, Lingshui Xian).

24. *Styrax benzoides* Craib, Bull. Misc. Inform. Kew 1912: 267. 1912.

滇南安息香 dian nan an xi xiang

Trees 9–12 m tall. Branchlets terete, densely gray-brown stellate tomentose. Leaves alternate; petiole 1–1.5 cm, nearly 4-angled; leaf blade ovate to ovate-lanceolate, 5–7 × 3–6.5 cm, leathery, abaxially densely gray-brown stellate tomentose, adaxially glabrous or midvein densely stellate pubescent, base rounded, margin subentire, apex acuminate; secondary veins 5–9 per side, tertiary veins subparallel. Inflorescences axillary, many-flowered racemes or panicles, 2.5–5 cm. Flowers 1–1.2 cm. Pedicel ca. 4 mm. Calyx ca. 3.5 3 mm, truncate to undulate, rarely 5-toothed, densely stellate tomentose. Corolla tube ca. 2 mm; lobes oblong-lanceolate, ca. 9 2 mm. Filaments densely stellate villose on free part. Fruit globose to subglobose, 1–1.6 cm in diam., rugose, densely gray stellate tomentose, 3-valved, dehiscent. Seeds brown, glabrous. Fr. Oct.

Forest thickets in ravines; 800–1000 m. S Yunnan [Laos, Myanmar, N Thailand, Vietnam].

25. *Styrax suberifolius* Hooker & Arnott, Bot. Beechey Voy. 196. 1841.

栓叶安息香 shuan ye an xi xiang

Trees 4–20 m tall. Branchlets red-brown to gray-brown stellate tomentose. Leaves alternate; petiole 1–1.5(–2) cm, nearly 4-angled; leaf blade elliptic, oblong, or elliptic-lanceolate, 5–15(–18) × 2–5(–8) cm, leathery, abaxially densely brownish stellate tomentose, adaxially subglabrous or midvein sparsely stellate pubescent, base cuneate, margin subentire, apex acuminate and sometimes slightly curved; secondary veins 5–12 per side, tertiary veins subparallel. Inflorescences

terminal or axillary, many-flowered racemes or panicles, 6–12 cm. Flowers 1–1.5 cm. Pedicel 1–3 mm. Calyx 3–5(–7) 2–4(–7) mm, densely gray-yellow tomentose mixed with few stellate hairs; teeth ± rudimentary, deltoid to undulate. Corolla tube ca. 3 mm; lobes 4(or 5), lanceolate to oblong, 8–10 × 2–3 mm. Stamens 8–10, shorter than corolla; filaments expanded, stellate pubescent on free part. Fruit ovoid-globose, 1–1.8 cm in diam., densely gray to brown stellate tomentose, 3-valved, dehiscent, with persistent calyx enclosing to middle. Seeds brown, glabrous. Fl. Mar–May, fr. Aug–Nov.

100–3000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Myanmar, Vietnam].

- 1a. Leaf blade abaxially brownish tomentose 25a. var. *suberifolius*
1b. Leaf blade abaxially densely grayish white tomentose 25b. var. *hayataianus*

25a. *Styrax suberifolius* var. *suberifolius*

栓叶安息香 (原变种) shuan ye an xi xiang (yuan bian zhong)

Cyrta suberifolia (Hooker & Arnott) Miers; *Styrax caloneurus* Perkins; *S. oligophlebius* Merrill ex H. L. Li; *S. suberifolius* var. *caloneurus* Perkins; *S. suberifolius* var. *fargesii* Perkins.

Leaf blade abaxially densely brownish stellate tomentose. Fl. Mar–May, fr. Sep–Nov.

Mountain slopes in broad-leaved evergreen forests; 100–3000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Yunnan, Zhejiang [Vietnam].

25b. *Styrax suberifolius* var. *hayataianus* (Perkins) K. Mori, Trans. Nat. Hist. Soc. Taiwan 25: 418. 1935.

台北安息香 tai bei an xi xiang

Styrax hayataianus Perkins, Repert. Spec. Nov. Regni Veg. 8: 82. 1910; *S. formosanus* Matsumae var. *hayataianus* (Perkins) H. L. Li.

Leaf blade abaxially densely grayish white stellate tomentose. Fl. Apr–May, fr. Aug–Nov

* Mixed forests or thickets on mountain slopes; ca. 1000 m. Taiwan.

26. *Styrax agrestis* (Loureiro) G. Don, Gen. Hist. 4: 5. 1837.

喙果安息香 hui guo an xi xiang

Cyrta agrestis Loureiro, Fl. Cochinch. 1: 278. 1790; *Styrax rostratum* Hosokawa; *S. subcrenatus* Handel-Mazzetti.

Trees to 15 m tall. Trunk to 20 cm d.b.h. Branchlets sparsely brownish stellate pubescent or glabrous. Leaves alternate; petiole 0.8–1.5 cm; leaf blade elliptic, oblong, or elliptic-lanceolate, 5–15 × 3–8 cm, papery to almost leathery, yellow-green when dry, abaxially sparsely stellate pubescent, adaxially glabrous, base cuneate to broadly cuneate, margin entire or irregularly denticulate, apex slightly curved and acute to acuminate; secondary veins 4–7 per side,

tertiary veins reticulate, conspicuously raised on both surfaces. Racemes terminal, 5–10-flowered, 6–12 cm. Flowers 1.5–2.2 cm. Pedicel 0.8–1.5 cm. Calyx ca. 7 × 5 mm, densely yellow stellate tomentose and pubescent. Corolla tube ca. 4 mm; lobes lanceolate, ca. 1.2 cm × 4 mm. Stamens shorter than corolla; filaments flexuous at middle, free parts basal half villose. Fruit cylindrical to oblique ovoid, 1.2–3 × 0.8–1.6 cm, densely brownish stellate tomentose, apex usually short rostrate to short pointed. Seeds 1 or 2, brown, ellipsoid, rugose or smooth, densely scaly to glabrous. Fl. Mar–Nov, fr. Sep–Dec.

Dense forests; 100–700 m. S Guangdong, Hainan, S Yunnan [Indonesia, Laos, Malaysia, New Guinea, Vietnam; Pacific Islands].

27. *Styrax serrulatus* Roxburgh, Fl. Ind. ed. 1832, 2: 415. 1832.

齿叶安息香 chi ye an xi xiang

Trees 4–12 m tall. Trunk 9–25 cm d.b.h. Branchlets densely brown stellate pubescent. Leaves alternate; petiole 3–5 mm; leaf blade ovate, oblong, or ovate-lanceolate, 5–14 × 2–4(–5.5) cm, papery, sparsely stellate pubescent or glabrous, base broadly cuneate to rounded, margin serrate or rarely entire, apex acuminate to short acuminate; secondary veins 5–7 per side, tertiary veins reticulate, abaxially conspicuously raised. Inflorescences many-flowered racemes or panicles, 3–10 cm. Flowers 1–1.3 cm. Pedicel 3–8 mm. Calyx 3–4 × 3–4 mm, densely yellow stellate tomentose and pubescent teeth 5. Corolla outside puberulent, inside glabrous, tube 2–3 mm; lobes oblong-lanceolate, 7–9 × 2–3 mm. Stamens shorter than corolla; filaments expanded, slightly flexuous at middle, free parts basally white villose. Fruit ellipsoid to ellipsoid-ovoid, 0.8–1.6 cm × 6–8 mm, densely gray-brown stellate tomentose, sometimes sparsely stellate villose, apex slightly oblique and acute to apiculate. Seeds 1 or 2, dark brown, smooth or rugose, stellate pubescent or glabrous. Fl. Mar–May, fr. Jul–Nov.

Sparse forests; 500–1700 m. S Guangdong, S Guangxi, Hainan, Taiwan, SE Xizang, S Yunnan [Bhutan, India, Laos, W Malaysia, Myanmar, Nepal, Thailand, Vietnam].

28. *Styrax confusus* Hemsley, Bull. Misc. Inform. Kew 1906: 162. 1906.

赛山梅 sai shan mei

Trees 2–8 m tall. Trunk to 12 cm d.b.h. Branchlets densely brownish stellate pubescent. Leaves alternate; petiole 1–3 mm; leaf blade narrowly oblong, obovate-elliptic, or oblong-elliptic, 4–14 × 2.5–7 cm, leathery to almost leathery, sparsely stellate pubescent but gradually glabrescent, base rounded to broadly cuneate, margin serrulate, apex acute to short acuminate; secondary veins 5–7 per side, tertiary veins reticulate, conspicuously raised. Racemes terminal, 3–8-flowered, 4–10 cm. Flowers 1.3–2.2 cm. Pedicel 1–1.5 cm. Calyx 3–10 × 4–6 mm, densely yellowish to gray stellate tomentose and villose; teeth 5, deltoid. Corolla tube 3–4 mm; lobes lanceolate to oblong-lanceolate, 1.2–2 cm × 3–4 mm. Filaments slightly expanded, free parts basally densely white villose. Fruit subglobose to obovoid, 0.8–1.5 cm

in diam., densely yellowish stellate tomentose; exocarp 1–2 mm thick, rugose. Seeds brown, obovoid, smooth or deeply rugose. Fl. Apr–Oct.

* 100–1700 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Zhejiang

1a. Calyx ca. 3 mm 28b. var. *microphyllus*

1b. Calyx 5–8 mm.

2a. Leaf blade elliptic to obovate-elliptic, sparsely stellate pubescent; flowers ca.

1.5 cm 28a. var. *confusus*

2b. Leaf blade oblong-elliptic, glabrous;

flowers ca. 2.2 cm 28c. var. *superbus*

28a. *Styrax confusus* var. *confusus*

赛山梅 (原变种) sai shan mei (yuan bian zhong)

Styrax fukienensis W. W. Smith & Jeffrey; *S. juncudus* Diels; *S. mollis* Dunn; *S. philadelphoides* Perkins; *S. serrulatus* Roxburgh var. *vestitus* Hemsley.

Leaf blade elliptic to obovate-elliptic, sparsely stellate pubescent. Flowers 1.3–2.2 cm. Calyx 5–8 × 5–6 mm. Fl. Apr–Jun, fr Sep–Nov.

* Sparse forest on mountain slopes; 100–1700 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Zhejiang.

28b. *Styrax confusus* var. *microphyllus* Perkins in Engler, Pflanzenz. IV. 241(Heft 30): 24. 1907.

小叶赛山梅 xiao ye sai shan mei

Leaf blade narrowly oblong to obovate, glabrous. Flowers ca. 1.5 cm. Calyx ca. 3 × 4 mm. Fl. Sep–Oct.

* Thickets; ca. 800 m. Hubei (Yichang Xian).

28c. *Styrax confusus* var. *superbus* (Chun) S. M. Hwang, Acta Phytotax. Sin. 18: 161. 1980.

华丽赛山梅 hua li sai shan mei

Styrax philadelphoides Perkins var. *superbus* Chun, Sunyatsenia 1: 296. 1934.

Leaf blade oblong-elliptic, glabrous, margin serrate. Flowers to 2.2 cm. Calyx 8–10 × 5–6 mm, teeth conspicuous. Fl. May.

* Slopes and ravines in mixed forests; ca. 1000 m. Guangdong (Ruyuan Xian).

29. *Styrax dasyanthus* Perkins, Bot. Jahrb. Syst. 31: 485. 1902.

垂珠花 chui zhu hua

Styrax argyi H. Léveillé; *S. rubifolius* Guillaumin.

Trees 3–20 m tall. Trunk to 24 cm d.b.h. Branchlets densely gray-yellow stellate pubescent, becoming purple and glabrous. Leaves alternate; petiole 3–7 mm, densely stellate pubescent; leaf blade obovate-elliptic to elliptic, 7–14(–16) × 3.5–6.5(–8) cm, leathery to almost leathery, sparsely stellate pubescent and glabrescent or hairy only along veins, base cuneate to broadly cuneate, margin denticulate and slightly

revolute, apex acute to short acuminate; secondary veins 5–7 per side, tertiary veins reticulate, conspicuously raised. Inflorescences terminal or axillary, paniculate, many-flowered, 4–8 cm. Flowers 0.9–1.6 cm. Pedicel 6–10(–12) mm. Calyx ca. 4 × 3 mm; teeth 5, subulate to deltoid. Corolla tube 2.5–3 mm; lobes oblong to oblong-lanceolate, 6–8.5 × 1.5–2.5(–3) mm. Filaments expanded, free parts basally densely white villose. Fruit ovoid to globose, 0.9–1.3 cm × 5–7 mm, smooth or rugose, densely grayish stellate tomentose, apex short pointed, exocarp to 1 mm thick. Seeds brown, smooth. Fl. Mar–May, fr. Sep–Dec.

* Mixed forests; 100–1700 m. Anhui, Fujian, Guangxi, Guizhou, Hebei, Henan, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Yunnan, Zhejiang.

30. *Styrax formosanus* Matsumura, Bot. Mag. (Tokyo) 15: 75. 1901.

台湾安息香 tai wan an xi xiang

Shrubs 2–3 m tall. Branchlets densely brownish stellate pubescent, glabrescent. Leaves alternate; petiole 3–4 mm; leaf blade obovate, elliptic-rhomboid, or elliptic, 2–5(–7) × 1.5–2.5 cm, papery, sparsely brownish stellate pubescent but glabrescent, base cuneate, margin apically irregularly coarsely serrate or rarely 2–4-lobed, apex caudate to acuminate; secondary veins 3–5 per side, tertiary veins reticulate. Racemes terminal, 3–5-flowered, 2.5–4.5 cm. Flowers 1.2–1.4 cm, slightly pendulous. Pedicel 0.8–1.2 cm. Calyx 2.5–3 × 3–4 mm, truncate to obscurely 5-toothed, densely gray stellate tomentose. Corolla tube 2–3 mm; lobes 5(or 6), lanceolate to oblong-lanceolate, 8–11 × 2.5–3 mm, membranous. Stamens (9 or)10(or 11), shorter than corolla; filaments free part basally densely villose. Fruit ovoid, ca. 10 × 6 mm, irregularly rugose, apex beaked to apiculate. Seeds brown, ovoid, ca. 6 mm, glabrous. Fr. May–Aug.

* 500–1300 m. Anhui, Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Taiwan, Zhejiang.

1a. Petioles, pedicels, and bracteoles

sparsely stellate tomentose 30a. var. *formosanus*

1b. Petioles, pedicels, and bracteoles

densely stellate pubescent 30b. var. *hirtus*

30a. *Styrax formosanus* var. *formosanus*

台湾安息香 (原变种) tai wan an xi xiang (yuan bian zhong)

Petioles, pedicels, and bracteoles sparsely stellate tomentose. Leaf blade adaxially pubescent or glabrous. Fl. Apr–Mar, fr. May–Jun.

* Forest thickets on slopes; 500–1300 m. Anhui, Fujian, Guangdong, Guangxi, Hunan, Jiangxi, Taiwan, Zhejiang.

30b. *Styrax formosanus* var. *hirtus* S. M. Hwang, Acta Bot. Austr. Sin. 1: 77. 1983.

长柔毛安息香 chang rou mao an xi xiang

Petioles, pedicels, and bracteoles densely stellate pubescent and villose. Leaf blade adaxially sparsely villose. Fr. Jul–Aug.

* Thickets on mountain slopes, beside trails; 800–1000 m. Guangxi, Hunan, Zhejiang.

31. *Styrax faberi* Perkins in Engler, Pflanzenr. IV. 241(Heft 30): 33. 1907.

白花龙 bai hua long

Shrubs 1–2 m tall. Branchlets slender, densely stellate villose. Leaves alternate, sometimes subopposite on basal part of lateral twigs. Petiole 1–2 mm; leaf blade ovate, elliptic, or obovate, 4–11 × 3–3.5 cm, papery, sparsely brown to gray stellate pubescent to glabrescent, base broadly cuneate, auriculate, or subrounded, margin serrulate to remotely serrate, apex acuminate; secondary veins 5 or 6 per side, tertiary veins reticulate. Racemes terminal, 3–5-flowered, 3–4 cm. Pedicel 0.8–1.5 cm. Flowers 1.2–1.5(–2) cm, slightly pendulous after anthesis. Calyx 4–5 mm, membranous; teeth 5, deltoid to almost subulate. Corolla tube 3–4 mm; lobes lanceolate to oblong, 0.5–1.5 cm 2.5–3 mm, membranous, glabrous. Stamens 0.9–1.5 cm; filaments expanded, free parts basally densely villose. Fruit obovoid to subglobose, 6–8 5–7 mm, densely gray stellate pubescent; exocarp ca. 0.5 mm thick, smooth. Fr. May–Oct.

* 100–1000 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Zhejiang.

- 1a. Leaf blade orbicular to suborbicular, apex acute to obtuse 31c. var. *formosanus*
- 1b. Leaf blade ovate, ovate-lanceolate, elliptic, or obovate, apex acuminate to short acuminate.
 - 2a. Leaf blade elliptic to obovate, base broadly cuneate to subrounded, margin serrulate 31a. var. *faberi*
 - 2b. Leaf blade ovate to ovate-lanceolate, base auriculate, margin remotely

serrate 31b. var. *amplexifolius*

31a. *Styrax faberi* var. *faberi*

白花龙(原变种) bai hua long (yuan bian zhong)

Styrax faberi var. *acutiserratus* Perkins; *S. iopiliinus* Diels.

Leaf blade elliptic to obovate, base broadly cuneate to subrounded. Fl. Apr–Jun, fr. Aug–Oct.

* Scrub covered slopes or under forests; 100–600 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Taiwan, Zhejiang.

31b. *Styrax faberi* var. *amplexifolius* Chun & How ex S. M. Hwang, Acta Phytotax. Sin. 18: 161. 1980.

抱茎白花龙 bao jing bai hua long

Leaf blade ovate to ovate-lanceolate, thin papery, base auriculate to clasping, margin remotely serrate, apex acuminate. Seeds deeply rugose. Fr. Jul–Aug.

* Mixed forests or thickets; 800–1000 m. Hunan (Dongkou Xian).

31c. *Styrax faberi* var. *formosanus* (Matsumura) S. M. Hwang, Novon 4: 254. 1994.

苗栗白花龙 miao li bai hua long

Styrax rugosus Kurz var. *formosanus* Matsumura, Bot. Mag. (Tokyo) 15: 76. 1901; *S. faberi* var. *matsumuraei* (Perkins) S. M. Hwang; *S. formosanus* Matsumura var. *matsumuraei* (Perkins) Y. C. Liu; *S. matsumuraei* Perkins.

Leaf blade base broadly rounded to subrounded, apex acute to obtuse. Fr. May–Jul.

* Thickets on mountain slopes; ca. 1000 m. Taiwan.

2. BRUINSMIA Boerlage & Koorders, Natuurk. Tijdschr. Ned.-Indië 53(1): 68. 1893.

歧序安息香属 qi xu an xi xiang shu

Trees. Stipules absent. Leaves alternate, serrate. Inflorescences terminal or axillary, cymes compound; bracteoles 1 per flower. Pedicel jointed. Flowers bisexual or polygamodioecious. Calyx broadly campanulate, adnate to base of ovary, truncate or slightly 5-toothed, enlarged in fruit. Corolla lobes 5, imbricate. Stamens 10(–12); filaments slightly coherent to each other and to petals. Ovary superior, broadly conical, 5-locular; ovules many; placentation axile. Style 5-angular; stigma capitate, 5- or 6-lobed. Fruit pyriform, crowned by persistent style, indehiscent. Seeds many, pointed at both ends; seed coat foveolate-rugose; endosperm fleshy-horny; embryo central, straight.

Two species: India, Malaysia, New Guinea; one species in China.

1. *Bruinsmia polysperma* (C. B. Clarke) Steenis, Bot. Jahrb. Syst. 86: 393. 1967.

歧序安息香 qi xu an xi xiang

Styrax polyspermus C. B. Clarke, Fl. Brit. India 3: 590. 1882.

Trees to 15 m tall. Trunk to 60 cm d.b.h. Branchlets terete, glabrous. Winter buds naked, stellate pubescent. Petiole ca. 1.3 cm, glabrous, sulcate; leaf blade oblong-elliptic, 14–17 × 6–8

cm, greenish when dry, thin leathery, subglabrous, base cuneate, margin remotely serrate to entire, apex acuminate; secondary veins 5–8 per side, tertiary veins reticulate, abaxially conspicuously raised. Bracteole lanceolate, ca. 1.2 mm. Pedicel 1–2 mm. Calyx 1.5–2 × 5–6.5 mm, densely stellate pubescent. Corolla white; lobes ovate-oblong, ca. 1.5 mm, pubescent on both sides. Filaments 1.5–3 mm, slightly flattened, glabrous or short pubescent inside and on margin. Fruit oblong-ellipsoid, 1–1.2 cm × 7–9 mm, apex beaked, pericarp with bony endocarp and pulpy exocarp. Seeds ca. 1.5

mm, oblong, pointed at both ends, strongly rugose. Fl. Apr–Jul, fr. Oct–Dec.

Primary forests; 1100–1300 m. Yunnan (Jinggu Xian) [India].

3. ALNIPHYLLUM Matsumura, Bot. Mag. (Tokyo) 15: 67. 1901.

赤杨叶属 *chi yang ye shu*

Trees deciduous. Leaves alternate; stipules absent; leaf blade margin serrate. Inflorescences terminal or axillary, racemes or panicles; bracteoles small. Pedicel jointed. Flowers bisexual. Calyx tube cupular, 5-toothed. Corolla campanulate; lobes 5, imbricate. Stamens 10, 5 long and 5 short; filaments broad and flattened, mostly connate into a broad tube and adnate to corolla; anthers oblong. Ovary superior, 5-locular; ovules 8–10 per locule, 2 series in central axis. Style linear, slender; stigma obscurely 5-lobed. Fruit capsular, loculicidally dehiscent into 5 valves, exocarp slightly fleshy. Seeds with irregularly membranous wings at each end; embryo straight.

Three species: China, India, Laos, Myanmar, Vietnam; three species in China.

- 1a. Inflorescences 3–5 cm; pedicel 1–2 mm; seeds ca. 3.5 mm 3. *A. eberhardtii*
1b. Inflorescences 8–15(–20) cm; pedicel 4–8 mm; seeds 5–7 mm.
2a. Leaf blade elliptic, broadly elliptic, or obovate-elliptic, indument brown; calyx 4–5 mm 1. *A. fortunei*
2b. Leaf blade ovate to ovate-lanceolate, rarely elliptic-lanceolate, indument gray; calyx ca. 6 mm 2. *A. pterospermum*

1. *Alniphyllum fortunei* (Hemsley) Makino, Bot. Mag. (Tokyo) 20: 93. 1906.

赤杨叶 *chi yang ye*

Halesia fortunei Hemsley in F. B. Forbes & Hemsley, J. Linn. Soc., Bot. 26: 75. 1889; *Alniphyllum buddleifolium* Hu & Cheng; *A. fauriei* Perkins; *A. hainanense* Hayata; *A. macroanthum* Perkins; *A. megaphyllum* Hemsley & E. H. Wilson.

Trees to 20 m tall. Trunk straight; bark gray-brown. Branchlets brownish stellate pubescent. Petiole 1–2 cm; leaf blade elliptic, broadly elliptic, or obovate-elliptic, 5–15(–20) × 4–7(–11) cm, papery, sparsely to densely brown stellate pubescent to tomentose, abaxially sometimes glabrescent, base broadly cuneate to cuneate, margin remotely serrate, apex acute to acuminate; secondary veins 7–12 per side, tertiary veins reticulate. Inflorescences terminal or axillary, racemes or panicles, 10–20-flowered, 8–15(–20) cm. Flowers 1.5–2 cm. Pedicel 4–8 mm. Calyx 4–5 mm, densely gray stellate pubescent; teeth ovate-lanceolate. Corolla lobes elliptic, 1–1.5 cm × 5–7 mm. Filament tube ca. 8 mm; anthers ca. 3 mm. Style 1.5–1.8 cm, villose. Fruit oblong to ellipsoid, 1–1.8(–2.5) × 0.6–1(–1.2) cm, sparsely white stellate pubescent or glabrous. Seeds 5–7 mm. Fl. Apr–Jul, fr. Aug–Oct.

Mixed slopes; 200–2200 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hubei, Hunan, Jiangsu, Jiangxi, Sichuan, Yunnan, Zhejiang [India, Laos, Myanmar, Vietnam].

2. *Alniphyllum pterospermum* Matsumura, Bot. Mag. (Tokyo) 15: 67. 1901.

台湾赤杨叶 *tai wan chi yang ye*

Trees to 15 m tall. Trunk 30–50 cm d.b.h., straight. Branchlets densely brown stellate pubescent or

glabrous. Petiole 1–1.2 cm; leaf blade ovate to ovate-lanceolate, sometimes elliptic-lanceolate, 10–15 × 4–5 cm, membranous to leathery, gray stellate pubescent, abaxially slightly denser, base cuneate to broadly cuneate, margin remotely serrate, apex acuminate; secondary veins 9–11 per side, tertiary veins reticulate. Panicles axillary in apical part of branchlets, 10–15-flowered, ca. 8 cm. Flowers 1.3–1.6 cm. Pedicel ca. 4 mm. Calyx ca. 6 mm, stellate pubescent; teeth lanceolate. Corolla lobes oblong, ca. 1.3 cm × 5 mm, apex rounded. Filament tube ca. 8 mm. Style ca. 1.8 mm. Fruit oblong to long ellipsoid, ca. 1.2 cm. Seeds narrowly oblong, 5–7 mm. Fl. Apr–May, fr. Aug–Sep.

* Sparse forests; ca. 700 m. Taiwan.

3. *Alniphyllum eberhardtii* Guillaumin, Bull. Soc. Bot. France 70: 885. 1923.

滇赤杨叶 *dian chi yang ye*

Trees 10–30 m tall. Trunk to 30 cm d.b.h. Branchlets and petioles densely brown scaly, soon glabrescent. Leaf blade, oblong-elliptic to elliptic-lanceolate, 10–18 × 5–8 cm, papery, abaxially densely gray to yellowish stellate tomentose, adaxially sparsely stellate pubescent or glabrous, base cuneate to broadly cuneate, margin serrulate, apex acute to acuminate; secondary veins 11–15 per side, tertiary veins subparallel. Panicles, compact, 10–30-flowered, 3–5 cm. Flowers ca. 1.5 cm. Pedicel 1–2 mm. Calyx ca. 4 mm, densely yellow stellate pubescent; teeth ovate-lanceolate, ca. 2 mm. Corolla lobes oblong to elliptic, 1–1.3 cm. Filament tube ca. 1 cm; anthers ca. 3 mm. Style longer than corolla. Fruit oblong, 7–12 mm. Seeds ca. 3.5 mm. Fl. Mar–Apr, fr. Jul–Sep.

Mixed forests; 600–800 m. S Guangxi, SE Yunnan [Vietnam].

4. HUODENDRON Rehder, J. Arnold Arbor. 16: 341. 1935.

山茉莉属 *shan mo li shu*

Trees or shrubs, deciduous. Winter buds naked. Leaves alternate; stipules absent; leaf blade margin entire or serrate. Inflorescences terminal or axillary, paniculate or subcorymbose; bracts and bracteoles small, early deciduous. Flowers small, bisexual. Calyx tube adanate to ovary, 5-toothed. Petals 5, bases slightly coherent, free, imbricate or valvate, revolute after anthesis. Stamens 8–10, exserted; filaments slightly adnate to petals; anthers oblong, connective produced beyond locule into a conspicuous 2- or 3-dentate appendage. Ovary half-inferior, 3- or 4-locular; ovules numerous per locule, erect; placentation axile. Fruit capsular, ovoid, 1/3–2/3 surrounded by calyx, loculicidally dehiscent. Styles 3–5, partly connate; stigma capitellate. Seeds numerous, flattened; seed coat thin, reticulate, fringed on both sides; embryo straight.

Four species: China, Myanmar, Thailand, Vietnam; three species in China.

- 1a. Leaves abaxially densely gray tomentose, adaxially glabrous 3. *H. tomentosum*
1b. Leaves glabrous or only veins sparsely pubescent.
2a. Inflorescences and fruit glabrous; styles connate to middle; leaves glabrous, reticulate veins
conspicuously raised on both surfaces when dry 1. *H. tibeticum*
2b. Inflorescences and fruit gray stellate tomentose; styles connate almost to apex; leaves pubescent
only on veins, reticulate veins raised only on abaxial surface 2. *H. biaristatum*

1. *Huodendron tibeticum* (J. Anthony) Rehder, J. Arnold
Arbor. 16: 342. 1935.

西藏山茉莉 xi zang shan mo li

Styrax tibeticus J. Anthony, Notes Roy. Bot. Gard.
Edinburgh. 15: 245. 1927.

Trees or shrubs 6–25 m tall. Trunk to 25 cm d.b.h. Branchlets dark brown. Petiole 5–10 mm; leaf blade lanceolate to elliptic-lanceolate, rarely ovate-lanceolate, 6–11 × 2.5–4 cm, papery, base broadly cuneate, margin entire or slightly serrate, apex acuminate to acute; secondary veins 5–9 per side, tertiary veins reticulate, distinct on both surfaces when dry. Inflorescences terminal, subcorymbose, 8–12-flowered, 4–8 cm. Pedicel slender, 3–5 mm. Calyx tube ca. 2 mm; teeth ovate-deltoid. Petals linear-oblong, 6–7 × 1–1.5 mm, apex obtuse. Stamens as long as petals; filaments 4–5 mm, glabrous; anthers ca. 2 mm, connective appendage 3-dentate. Styles 3–5, connate to middle. Fruit ovoid, ca. 3 mm. Seeds brown, ca. 1 mm, reticulately striate. Fl. Mar–May, fr. Aug–Sep.

Dense forests; 1000–3000 m. NE Guangxi, Guizhou, W Hunan, SE Xizang, Yunnan [Vietnam].

2. *Huodendron biaristatum* (W. W. Smith) Rehder, J. Arnold
Arbor. 16: 344. 1936.

双齿山茉莉 shuang chi shan mo li

Shrubs or trees to 12 m tall. Trunk to 25 cm d.b.h. Branchlets tomentose or glabrous. Petiole 0.5–1.5 cm; leaf blade elliptic, elliptic-lanceolate, or obovate-oblong, 5–17 × 2.5–6 cm, abaxially glabrous except veins axils with tufted hairs, adaxially yellow-green when dry and glabrous or gray stellate pubescent on veins, base cuneate, margin remotely serrate, apex acute, obtuse, or acuminate; secondary veins 4–9(–11) per side, tertiary veins abaxially distinct, reticulate. Inflorescences terminal or axillary, subcorymbose, 3–10 cm, densely gray-tomentose. Pedicel ca. 1 cm. Calyx ca. 2 mm, pubescent; teeth deltoid. Petals yellowish, narrowly oblong, 6–9 × 2–2.5 mm. Stamens 8–10, as long as petals; filaments and connective pubescent. Style slightly longer than stamens, apically 3-parted. Fruiting pedicel slightly curved. Fruit ovoid, 4–5 mm, densely gray tomentose. Seeds 1–1.3 mm. Fl. Apr–May, fr. Jun–Oct.

200–600 m. Guangdong, Guangxi, Guizhou, Hunan, Jiangxi, Yunnan [Myanmar, Thailand, Vietnam].

- 1a. Leaf blade primary and secondary
veins adaxially impressed and
abaxially pubescent where
they join 2a. var. *biariastrum*
1b. Leaf blade primary and secondary
veins adaxially raised and abaxially
glabrous 2b. var. *parviflorum*

2a. *Huodendron biaristatum* var. *biaristatum*

双齿山茉莉 shuang chi shan mo li (yuan bian zhong)

Styrax biaristatus W. W. Smith, Notes Roy. Bot. Gard.
Edinburgh 12: 233. 1920; *Huodendron chunianum* Hu.

Branchlets tomentose. Petiole densely gray stellate pubescent; leaf blade 8–17 × 2.5–6 cm, primary and secondary veins adaxially impressed, abaxially pubescent where they join, secondary veins 5–9(–11) per side. Fl. Apr–May, fr. Jun–Sep.

Forest thickets on slopes and in ravines; 200–500 m. Guangxi, Guizhou, Yunnan [Myanmar, Thailand, Vietnam].

2b. *Huodendron biaristatum* var. *parviflorum* (Merrill)
Rehder, J. Arnold Arbor. 16: 346. 1935.

岭南山茉莉 ling nan shan mo li

Styrax parviflorus Merrill, J. Arnold Arbor. 8: 15. 1927.

Branchlets and petioles glabrous. Leaf blade 5–10 × 2.5–4.5 cm, primary and secondary veins adaxially raised and abaxially glabrous, secondary veins 4–6 per side. Fl. Apr–May, fr. Aug–Oct.

* Dense forests in valleys; 300–600 m. Guangdong, Guangxi, Hunan, Jiangxi, Yunnan.

3. *Huodendron tomentosum* Y. C. Tang ex S. M. Hwang,
Acta Phytotax. Sin. 18: 164. 1980.

绒毛山茉莉 rong mao shan mo li

Trees to 20 m tall. Trunk to 26 cm d.b.h.; bark gray to brownish. Branchlets densely brownish tomentose. Petiole

1.5–2 cm; leaf blade oblong, oblong-lanceolate, or obovate-oblong, 5–9.5 × 1.5–3.5 cm, abaxially densely gray tomentose, adaxially glabrous, base cuneate, margin entire and slightly revolute, apex acuminate to obtuse; secondary veins 7–9 per side, tertiary veins reticulate. Panicles terminal, 4–8 cm, densely gray tomentose. Flowers ca. 7 mm. Pedicel 5–8 mm. Calyx ca. 2 mm, densely yellow stellate tomentose; teeth 5, ovate-deltoid. Petals yellowish, oblong, ca. 6 × 2 mm, imbricate, apex acute. Filaments basally villose. Style ca. 6 mm, apically 3-parted, villose. Ovary ovoid, 4-locular, villose; ovules numerous.

About 1900 m. N Guangxi, SW Yunnan [Vietnam].

- 1a. Leaf blade tertiary veins distinct 3a. var. *tomentosum*
1b. Leaf blade tertiary veins obscure .. 3b. var. *guangxiensis*

3a. *Huodendron tomentosum* var. *tomentosum*

绒毛山茉莉(原变种) rong mao shan mo li (yuan bian zhong)

Leaf blade oblong-lanceolate to obovate-oblong, tertiary veins distinct. Fr. May–Jul.

* Mixed forests; 1900 m. SW Yunnan.

3b. *Huodendron tomentosum* var. *guangxiensis* S. M. Hwang & C. F. Liang in S. M. Hwang, Acta Phytotax. Sin. 18: 165. 1980.

广西山茉莉 guang xi shan mo li

Leaf blade oblong, tertiary veins obscure. Fl. Apr–May.

* Dense forests; ca. 1900 m. N Guangxi.

5. *HALESIA* J. Ellis ex Linnaeus, Syst. Nat. ed. 10, 1044. 1759.

银钟花属 yin zhong hua shu

Trees or shrubs, deciduous. Winter buds enclosed by scales. Leaves alternate; stipules absent; leaf blade margin serrate. Flowers fascicled or in short racemes at nodes of 1-year old branchlets. Pedicel slender, jointed. Flowers opening before leaves. Calyx tube obconical, adnate to ovary, 4-ribbed expanding in fruit; teeth 4, short. Corolla campanulate; lobes 4(or 5), imbricate, base short connate. Stamens 8–16, in 1 series, almost separate from petals, basally slightly connate; anthers oblong. Ovary often inferior, 2–4-locular; ovules 4 per locule, basally pendulous, apically ascending; placentation axile. Style elongated; stigma 4-lobed. Drupe almost dry, 2–4-winged, indehiscent, apex with persistent calyx teeth and style base forming a beak. Seeds oblong, terete; seed coat crusty; cotyledons oblong.

Five species: E North America, China; one species in China.

1. *Halesia macgregorii* Chun, J. Arnold Arbor. 6: 144. 1925.

银钟花 yin zhong hua

Halesia macgregorii var. *crenata* Chun.

Trees to 24 m tall. Trunk to 45 cm d.b.h. Branchlets purple-brown. Petiole 5–10 cm; leaf blade elliptic to ovate-elliptic, 5–13 × 3–4.5 cm, abaxially greenish, pubescent when young, glabrescent, adaxially green and glabrous, base cuneate to rounded, margin serrate, apex slightly curved and acuminate to short acuminate; secondary veins 10–24 per side, tertiary veins reticulate. Flowers often pendulous, ca. 1.5 cm.

Pedicel 5–8 mm, slender. Calyx tube obconical, ca. 3 mm; teeth deltoid-lanceolate. Corolla tube 1–1.5 cm; lobes 4, 1–1.2 cm × ca. 8 mm, ciliate. Stamens 8, 4 long and 4 short, 1.2–1.9 cm. Style longer than corolla. Drupe yellowish to brownish red, ellipsoid to ovate, 2.5–4 × 2–3 cm. Seeds brown. Fl. Mar–Apr, fr. Jul–Oct.

* Damp shaded areas on slopes, forest edges; 700–1200 m. NW Fujian, N Guangdong, N Guangxi, S Guizhou, SW Hunan, S Jiangxi, Zhejiang.

6. *MELLIODENDRON* Handel-Mazzetti, Anz. Akad. Wiss. Wien., Math.-Naturwiss. Kl. 59: 109. 1922.

陀螺果 tuo lu guo shu

Trees deciduous. Winter buds ovate, enclosed by scales. Leaves alternate; stipules absent; leaf blade margin serrate. Pedicel elongated, jointed. Flowers bisexual, 1 or 2 in leaf axils of older shoots, opening before or at same time as leaves. Calyx tube obconical, adnate to ovary, 4-toothed to undulate, expanded in fruit. Corolla campanulate, divided almost to base; lobes 5, imbricate. Stamens 10, in 1 series, equal, much shorter than corolla; filaments basally connate into a tube, adnate to corolla tube; anthers oblong. Ovary inferior, imperfectly 5-locular; ovules 4 per locule, erect to pendulous; placentation axile. Style slender, linear; stigma capitate or obscurely 5-lobed. Fruit mostly adnate to calyx, ribbed or angular, tomentose apex usually produced beyond calyx into a beak, wall thick and woody, indehiscent. Seeds ellipsoid, flattened; seed coat membranous; endosperm fleshy.

* One species: endemic to China.

1. *Meliiodendron xylocarpum* Handel-Mazzetti, Anz. Akad. Wiss. Wien, Math.-Naturwiss. Kl. 59: 109. 1922.

陀螺果 tuo lu guo

Meliiodendron jifungense Hu; *M. wangianum* Hu.

Trees 6–20 m tall. Trunk to 20 cm d.b.h.; bark gray-brown often irregularly exfoliated. Winter buds ovate, ca. 1 cm. Petiole 3–10 mm; leaf blade ovate-lanceolate to oblong-elliptic, 9.5–21 × 3–8 cm, papery, densely stellate pubescent when young, glabrescent except on veins, base cuneate, apex short

acuminate to acute; secondary veins 7–9 per side, tertiary veins reticulate, abaxially raised. Flowers subsessile or on pedicel to 1.5 cm. Calyx 3–4 mm; teeth ca. 2 mm. Corolla lobes oblong, 2–3 × 0.8–1.5 cm. Style ca. 1.3 cm. Fruit variable in form and size, usually obovoid, obconical, or obovoid-pyriform, (2–)4–7 × 1.5–3(–4) cm, 5–10-ribbed, densely gray stellate tomentose, apex rounded, acute, or short beaked. Fl. Apr–May, fr. Jul–Oct.

* Forest ravines; 600–1500 m. Fujian, N Guangdong, NW Guangxi, Guizhou, Hunan, Jiangxi, S Sichuan, SE Yunnan.

7. PTEROSTYRAX Siebold & Zuccarini, Fl. Jap. 1: 94. 1839.

白辛树属 bai xin shu shu

Trees or shrubs, deciduous. Winter buds naked. Leaves alternate; stipules absent; leaf blade margin serrate or serrulate. Inflorescences pendulous, branches 1-sided, many flowered; bracteoles early deciduous. Flowers bisexual. Pedicel short, jointed. Calyx tube campanulate, 5-ribbed, completely adnate to ovary, 5-toothed. Corolla lobes 5, short coherent at base, imbricate. Stamens 10, 5 short and 5 long or subequal in length, in 1 series; filaments flattened, basally connate into a membranous tube. Ovary mostly inferior, 3–5-locular; ovules 4 per locule, erect or pendulous; placentation axile. Style elongated, subulate; stigma capitate or obscurely 3-lobed. Fruiting pedicel short. Drupe dry, ribbed or winged, with a persistent style forming distinct beak, exocarpy crusty, endocarp woody. Seeds 1 or 2, fleshy; endosperm thin.

Four species: China, Japan, Myanmar; two species in China.

- 1a. Fruit obovoid, prominently 5-winged, stellate tomentose; leaves abaxially stellate pubescent 1. *P. corymbosus*
- 1b. Fruit subfusiform, (5–)10-ribbed, densely gray-yellow hirsute; leaves abaxially minutely stellate tomentose 2. *P. psilophyllus*

1. *Pterostyrax corymbosus* Siebold & Zuccarini, Fl. Jap. 1: 96. 1839.

小叶白辛树 xiao ye bai xin shu

Halesia corymbosa (Siebold & Zuccarini) G. Nicholson.

Trees to 15 m tall. Trunk to 45 cm d.b.h. Branchlets densely stellate pubescent, soon glabrescent. Petiole 1–2 cm; leaf blade obovate, broadly obovate, or elliptic, 6–14 × 3.5–8 cm, papery, stellate pubescent when young, abaxially usually very densely pubescent, adaxially glabrescent, base cuneate, margin serrulate to sparsely glandular dentate, apex acute to abruptly acuminate; secondary veins 7–9 per side, tertiary veins reticulate. Panicles corymbose, 3–8 cm. Flowers ca. 1 cm. Pedicel 1–2 mm. Calyx ca. 3 mm; teeth lanceolate, ca. 2 mm. Corolla lobes oblong, ca. 10 × 3.5 mm, apex acute. Stamens longer than corolla; filaments white stellate pubescent. Fruit obovoid, 1.2–2.2 cm, 5-winged, densely stellate tomentose, apex with a conical beak 2–4 mm. Fl. Mar–Apr, fr. May–Sep.

Damp shaded areas along streams in forests; 400–1600 m. N Fujian, N Guangdong, Hunan, Jiangsu, Jiangxi, NW Zhejiang [Japan].

2. *Pterostyrax psilophyllus* Diels ex Perkins in Engler, Pflanzenz. IV. 241(Heft 30): 103. 1907.

白辛树 bai xin shu

Pterostyrax cavaleriei Guillaumin; *Styrax cavaleriei* H. Léveillé (1911), not H. Léveillé (1907).

Trees to 15 m tall. Trunk to 45 cm d.b.h. Branchlets stellate pubescent. Petiole 1–2 cm, densely stellate pubescent; leaf blade oblong-elliptic to obovate-oblong, 5–15 × 5–9 cm, abaxially densely grayish stellate tomentose, base cuneate, margin serrulate, sometimes coarsely serrate, or deeply 3-lobed, apex acute to acuminate; secondary veins 6–11 per side, tertiary veins subparallel. Panicles terminal or axillary, 10–15 cm. Flowers 1.2–1.4 cm. Pedicel ca. 2 mm. Corolla lobes oblong, apex acute. Filaments sparsely villose; anthers oblong. Fruit subfusiform, ca. 2.5 cm, 5–10-ribbed, densely gray-yellow hirsute, apex beaked. Fl. Apr–May, fr. Aug–Oct.

* Moist shaded areas in forests; 600–2500 m. W Guangxi, Guizhou, SW Hubei, E Sichuan, NE Yunnan.

Pterostyrax psilophyllus has often been included within the Japanese *P. hispida* Siebold & Zuccarini, which is easily distinguished by having leaf veins with many simple hairs.

8. SINOJACKIA Hu, Contr. Biol. Lab. Chin. Assoc. Advancem. Sci., Sect. Bot. 4(1): 1. 1928.

秤锤树属 cheng chui shu shu

Trees or shrubs, deciduous. Winter buds naked. Leaves alternate; stipules absent; leaf blade margin serrate or serrulate. Inflorescences terminal, racemelike, usually pendulous, few flowered; bracteoles early deciduous. Pedicel elongated, slender, jointed. Calyx tube obconical, adnate to ovary, 4–7-toothed. Corolla campanulate; lobes 4–7, imbricate, base short connate.

Stamens 8–14, in 1 series, inserted near base of corolla; filaments equal or unequal in length, ± connate at base; anthers oblong, connective slightly developed. Ovary inferior, 3- or 4-locular; ovules 6–8 per locule, in 2 series, erect or obliquely ascending; placentation axile. Style elongated, subulate; stigma usually obscurely 3-lobed. Fruit long ellipsoid to subglobose, indehiscent, extended beyond calyx into beak; exocarp fleshy, thick, and sometimes lenticellate; mesocarp spongy; endocarp woody. Seed 1; seed coat crusty; endosperm fleshy.

* Five species: endemic to China.

1a. Fruit stellate hairy.

2a. Fruit 3–4 cm, sparsely stellate pubescent, base not narrowed into pedicel 4. *S. henryi*

2b. Fruit 4.2–7.5 cm, sparsely grayish villose and very short stellate pubescent, base narrowed into pedicel 5. *S. dolichocarpa*

1b. Fruit glabrous.

3a. Fruit ellipsoid to narrowly ellipsoid with a long acuminate apical beak; pedicel to 2 cm 3. *S. rehderiana*

3b. Fruit ovoid with a conical apical beak or subglobose; pedicel 2.5–3 cm.

4a. Fruit 1.8–2 × 0.8–1.5 cm; pedicel ca. 3 cm 1. *S. xylocarpa*

4b. Fruit ca. 2.3 × 1.5–2.3 cm; pedicel 2.5–2.7 cm 2. *S. sarcocarpa*

1. *Sinojackia xylocarpa* Hu, Contr. Biol. Lab. Chin. Assoc. Advancem. Sci., Sect. Bot. 4(1): 1. 1928.

秤锤树 cheng chui shu

Trees to 7 m tall. Trunk to 10 cm d.b.h. Branchlets densely gray-brown stellate pubescent. Petiole ca. 5 mm; leaves at base of flower-bearing branches with blade ovate, 2–5 × 1.5–2 cm, base rounded to slightly cordate; other leaves with blade obovate to elliptic, 3–9 × 2–5 cm, base cuneate to subrounded; all blades glabrous or sparsely stellate pubescent, margin serrate, apex acute; secondary veins 5–7 per side. Inflorescences 3–5-flowered, 3–5 cm. Flowers pendulous. Pedicel ca. 5 cm. Calyx tube ca. 4 mm, densely stellate pubescent; teeth 5–7, lanceolate. Corolla lobes oblong-elliptic, 0.8–1.2 cm × ca. 6 mm, apex obtuse. Filaments ca. 4 mm, sparsely stellate pubescent. Style ca. 8 mm. Fruit ovoid including a conical beak, 1.8–2 × 0.8–1.5 cm, exocarp ca. 1 mm thick, mesocarp 3–3.5 mm thick. Seed dark brown, cylindrical-linear, ca. 1 cm. Fl. Mar–Apr, fr. Jul–Sep.

* Forest edges; 500–800 m. Jiangsu.

2. *Sinojackia sarcocarpa* L. Q. Lou, Acta Sci. Nat. Univ. Sunyatseni 31(4): 78. 1992.

肉果秤锤树 rou guo cheng chui shu

Trees or shrubs 7–10 m tall. Branchlets red-brown, sparsely stellate pubescent. Petiole 5–12 mm; leaves at base of flowering branches with blade ovate, 2–5 × 1.5–2 cm, base rounded to slightly cordate; other leaves with blade ovate to obovate, 6–15 × ca. 6.5 cm, base rounded; all blades papery, glabrous or sparsely stellate pubescent, margin remotely serrulate, apex acute to acuminate; secondary veins 5–7 per side. Inflorescences 2–4-flowered, 4–6 cm. Flowers white, pendulous, 1.5–2 cm. Pedicel 2.5–2.7 cm, sparsely stellate puberulent. Calyx tube 4–6 mm, densely stellate pubescent; teeth 5 or 6, obtuse. Corolla lobes elliptic, 0.9–1.5 cm × 6–8 mm. Filaments 4–6 mm, densely stellate tomentose. Style filiform, 8–11 mm. Fruit ovoid to subglobose including a conical beak, 2.3–3 × 1.5–2.3 cm, glabrous, rugose, lenticellate, slightly succulent, exocarp ca. 1 mm thick, mesocarp 5–9

mm thick, endocarp ca. 1 mm thick. Seed dark brown, subfusiform. Fl. Apr–May, fr. Oct–Nov.

* Thickets on mountain slopes or along stream banks; ca. 400 m. Sichuan (Leshan Xian).

3. *Sinojackia rehderiana* Hu, J. Arnold Arbor. 11: 227. 1930.

狭果秤锤树 xia guo cheng chui shu

Trees or shrubs to 5 m tall. Branchlets stellate pubescent. Petiole 1–4 mm; leaves at base of flowering branches with blade ovate, 2–3.5 × 1.5–2 cm, base rounded to slightly cordate; other leaves with leaf blade obovate-elliptic to elliptic, 5–9 × 3–4 cm, base cuneate to rounded; all leaf blades papery, densely stellate pubescent when young but glabrescent except for veins, margin serrate, apex acute to obtuse; secondary veins 5–7 per side, tertiary veins reticulate, abaxially conspicuously raised. Inflorescences lax, 4–6-flowered, 4–5 cm. Pedicel ca. 2 cm. Calyx ca. 5 mm, densely grayish stellate pubescent; teeth 5 or 6, deltoid, ca. 1 mm. Corolla lobes 5 or 6, ovate-elliptic, ca. 12 × 4 mm. Style ca. 6 mm. Fruit ellipsoid-cylindric including a long acuminate beak, 2–2.5 × 1–1.2 cm, gradually narrowed toward base, with brownish lenticels, exocarp ca. 1 mm thick, mesocarp ca. 3 mm thick, endocarp ca. 1 mm thick. Seed brown, oblong-cylindric. Fl. Apr–May, fr. Jul–Sep.

* Forest thickets; 500–800 m. N Guangdong, S Hunan, Jiangxi.

4. *Sinojackia henryi* (Dummer) Merrill, Sunyatsenia 3: 257. 1937.

棱果秤锤树 leng guo cheng chui shu

Pterostyrax henryi Dummer, Gard. Chron., ser. 3, 53: 19. 1913.

Trees or shrubs, 1.5–4 m tall. Branchlets slender, angular, densely brownish stellate pubescent. Petiole 5–8 mm, densely brownish stellate pubescent; leaf blade elliptic to ovate-elliptic, 4.5–10 × 1.5–3 cm, papery, glabrous except for grayish stellate pubescent veins; secondary veins 5–8 per side, tertiary veins reticulate, conspicuously raised. Inflorescences 3–6-flowered, 3–5 cm. Flowers pendulous. Pedicel 1.2–1.5 cm. Calyx obconical, ca. 6 mm, ribbed, densely grayish stellate pubescent; teeth

deltoid-lanceolate, acuminate. Corolla lobes obovate to oblong, ca. 10 × 5 mm, apex obtuse. Stamens 1–1.3 cm; filaments flattened, ca. 5 mm, stellate villose. Style ca. 1 cm. Fruit cylindrical-ellipsoid including beak, gradually narrowed toward base but not into pedicel, 3–4 cm × 4–6 mm, with lenticels, sparsely stellate pubescent, exocarp and adnate mesocarp ca. 1.5 mm thick, endocarp ca. 1 mm thick. Seed brown. Fl. Mar–Apr, fr. Jun–Jul.

* Forested slopes and ravines; 100–3500 m. N Guangdong, S Hubei, Hunan, Sichuan.

5. *Sinojackia dolichocarpa* C. J. Qi, Acta Phytotax. Sin. 19: 526. 1981.

长果秤锤树 chang guo cheng chui shu

Trees 10–12 m tall. Trunk 12–14 cm d.b.h., bark smooth. Branchlets reddish brown, striate. Petiole 4–7 mm; leaf blade ovate-oblong, elliptic, or ovate-lanceolate, 8–13 × 3.5–4.8 cm,

abaxially sparsely villose, adaxially often sparsely stellate pubescent on midvein, base broadly cuneate to rounded, margin serrulate, apex acuminate; secondary veins 8–10 per side, tertiary veins reticulate. Inflorescences 5- or 6-flowered, 4–6 cm. Pedicel 1.4–2 cm, gray villose. Calyx tube turbinate, ca. 2.5 mm, gray villose, limb truncate. Corolla lobes 4, elliptic-oblong, 4–14 × 5–7 mm. Stamens 8, 7–10 mm; filaments flattened. Stigma undivided. Fruit long ellipsoid including beak, 4.2–7.5 × 0.8–1.1 cm, 8-ribbed, densely grayish villose and short stellate pubescent, base gradually narrowed into pedicel, 4-locular, exocarp adnate to mesocarp. Seed 1 per locule, linear-oblong, ca. 1 cm. Fl. Apr, fr. Jun.

* Thickets on mountain slopes or along stream banks; 400–500 m. Hunan (Shimen Xian).

It has been proposed that *Sinojackia dolichocarpa* be transferred to the monotypic genus *Changiostyrax* as *C. dolichocarpus* (C. J. Qi) C. T. Chen (Guihaia 15: 291. 1995).

9. REHDERODENDRON Hu, Sinensia 2: 109. 1932.

木瓜红属 mu gua hong shu

Trees deciduous. Winter buds enclosed by scales. Leaves alternate; stipules absent; leaf blade margin serrate or serrulate. Inflorescences axillary or at nodes of previous year branchlets, racemose or paniculate. Pedicel jointed. Flowers opening before or at same time as leaves. Calyx tube obconical, completely adnate to ovary, 5–10-ribbed, 5-toothed. Corolla campanulate; lobes 5, imbricate, basally short connate. Stamens 10, 5 long and 5 short; filaments flattened, basally connate and adnate to corolla; anthers ovate to oblong. Ovary inferior, 3- or 4-locular; ovules 4 per locule, basally pendulous, apically erect; placentation axile. Style elongated, slender; stigma obscurely 4- or 5-lobed. Fruit woody, indehiscent, 5–10-ribbed, mostly adnate to calyx, apex with persistent calyx and style base forming a short rostrum; exocarp thin, hard; mesocarp thick, fibrous-spongy; endocarp intruded by mesocarp, with many radiate lacunas. Seeds 1–3, narrowly cylindrical; seed coat almost leathery; embryo fleshy.

Five species: SW China, Myanmar, Vietnam; five species in China.

1a. Leaves stellate hairy.

2a. Leaves abaxially densely stellate tomentose; fruit stellate tomentose, coarsely rugose between ribs 1. *R. kweichowense*

2b. Leaves abaxially sparsely stellate pubescent; fruit glabrous, smooth between ribs 2. *R. gongshanense*

1b. Leaves glabrous except for veins or when young.

3a. Fruit reddish brown with prominent pale brown spots; leaves always glabrous; branchlets reddish brown 5. *R. indochinense*

3b. Fruit brown, not spotted; leaves often with some hairs at least on veins; branchlets dark purplish.

4a. Flowers opening at same time as leaves; corolla lobes 1.5–1.8 × 0.5–0.8 cm; stamens slightly longer than corolla 3. *R. macrocarpum*

4b. Flowers opening before leaves expand; corolla lobes 2–2.5 × 1–1.4 cm; stamens shorter than or equal to corolla 4. *R. kwangtungense*

1. *Rehderodendron kweichowense* Hu, Sinensia 2: 109. 1932.

贵州木瓜红 gui zhou mu gua hong

Rehderodendron praeteritum Sleumer; *R. tsiangii* Hu & Cheng; *R. yunnanensis* Hu.

Trees to 15 m tall. Trunk to 30 cm d.b.h. Branchlets stellate pubescent or glabrous. Winter buds ovate-oblong, 5–6 mm. Petiole ca. 1 cm; leaf blade elliptic to ovate-elliptic, 12–20 × 5–9.5 cm, abaxially densely brownish stellate tomentose, adaxially densely brownish stellate pubescent on veins, base rounded to broadly cuneate, margin remotely serrate, apex

short acuminate to acute; secondary veins 8–12 per side, tertiary veins reticulate, raised. Inflorescences racemes or panicles, 5–16-flowered, 6–10 cm. Pedicel 3–6 mm. Flowers 1.2–1.5 cm. Calyx ca. 3 × 2 mm, densely yellow stellate tomentose; teeth deltoid. Corolla lobes oblong to obovate-elliptic, ca. 1.3 cm × 5 mm. Filaments white stellate villose. Fruit cylindrical to cylindrical-ellipsoid, slightly curved, 5–7.5 × 3–4.5 cm, 10–12-ribbed, coarsely rugose between ribs, densely gray-brown to brownish stellate tomentose, exocarp ca. 1 mm thick, mesocarp ca. 1 cm thick, endocarp 3–4 mm thick. Seeds 2–4, cylindrical, ca. 6 mm. Fl. Apr–May, fr. Aug–Sep.

Dense forests; 500–1500 m. Guangdong, Guangxi, Guizhou, SE Yunnan [Vietnam].

2. *Rehderodendron gongshanense* Y. C. Tang, Acta Bot. Yunnan. 10: 350. 1988.

贡山木瓜红 gong shan mu gua hong

Trees to 10 m tall. Trunk to 20 cm d.b.h. Branchlets stellate tomentose or glabrous. Petiole 6–10 mm; leaf blade elliptic to oblong, 9–20 × 4–10 cm, sparsely stellate pubescent, base subrounded, margin serrulate, apex acute to short acuminate; secondary veins 7–12 per side, tertiary veins reticulate, conspicuous. Flowers unknown. Fruit cylindrical, usually slightly curved, 5–7 × 2–2.5 cm, 9- or 10-ribbed, inconspicuously raised, slightly conic-umbonate, glabrous, exocarp ca. 1 mm thick, mesocarp ca. 8 mm thick, endocarp 3–4 mm thick and lacunate. Seeds 1, cylindrical-fusiform, ca. 4 cm × 4 mm. Fr. Aug.

* Broad-leaved evergreen forests; ca. 1500 m. Yunnan (Gongshan Xian).

3. *Rehderodendron macrocarpum* Hu, Bull. Fan. Mem. Inst. Biol. 3: 78. 1932.

木瓜红 mu gua hong

Rehderodendron mapienense Hu.

Trees 7–10 m tall. Trunk to 20 cm d.b.h.; bark dark gray. Branchlets purple stellate pubescent or glabrous. Winter buds ovate to oblong-ovate. Petiole 1–1.5 cm; leaf blade oblong-ovate, elliptic, or oblong-elliptic, 9–13 × 4–5.5 cm, abaxially glabrous but veins slightly pubescent, adaxially glabrescent, base cuneate, margin remotely serrate, apex acute to short acuminate; secondary veins 7–13 per side, tertiary veins reticulate, conspicuously raised. Racemes 6–8-flowered, 4–5 cm, densely grayish stellate pubescent. Pedicel 3–10 mm. Flowers opening at same time as leaves. Calyx ca. 4 × 3 mm, densely stellate pubescent; teeth deltoid, ca. 2 mm, apex acuminate. Corolla lobes elliptic to obovate, 1.5–1.8 cm × 5–8 mm, apex obtuse. Fruit red-brown, cylindrical to cylindrical-ovoid, slightly curved, 3.5–9 × 2.5–3.5 cm, 8–10-ribbed, smooth between ribs, glabrous, exocarp ca. 1.5 mm thick, mesocarp ca. 1 cm thick, endocarp 3–4 mm thick. Seeds brown, 2–2.5 cm. Fl. Mar–Apr, fr. Jul–Sep.

Dense forests; 1000–1500 m. Guangxi, Sichuan, Yunnan [Vietnam].

10. PARASTYRAX W. W. Smith, Notes Roy. Bot. Gard. Edinburgh. 12: 231. 1920.

茉莉果属 mo li guo shu

Trees. Winter buds naked. Leaves alternate; stipules absent; leaf blade margin entire or callose-denticulate. Inflorescences in axillary thyrses, usually from near base of branchlets; bracteoles early deciduous. Pedicel very short, jointed. Flowers bisexual. Calyx cupular, adnate to ovary, limb subtruncate. Corolla lobes 5, basally connate, imbricate. Stamens 10–16, included, equal in length or 5 long and 5 short; filaments basally connate into a cylindrical tube, free from corolla tube; anthers oblong. Ovary mostly inferior, 3-locular; ovules numerous per locule. Style elongated, subulate; stigma capitate. Drupe indehiscent, with large lenticels when mature, 1- or 2-locular by abortion, without wings or ribs, with persistent calyx, apex conical, exocarp fleshy. Seeds 4–8.

Two species: SW China, Myanmar; two species in China.

1a. Calyx tube ca. 1 mm; stamens 10; filaments connate into a tube for most of their length, free parts

4. *Rehderodendron kwangtungense* Chun, Sunyatsenia 1: 290. 1943.

广东木瓜红 guang dong mu gua hong

Rehderodendron hui Chun.

Trees to 15 m tall. Trunk to 20 cm d.b.h.; bark gray. Branchlets smooth. Winter buds red-brown, oblong to ovate. Petiole 1–1.5 cm; leaf blade oblong-elliptic to elliptic, 7–16 × 3–8 cm, glabrous or slightly stellate and villose on veins, base cuneate, margin remotely serrate, apex acute to acuminate; secondary veins 7–11 per side, tertiary veins reticulate, raised, usually purplish. Racemes 6–8-flowered, ca. 7 cm. Calyx densely gray-yellow stellate pubescent. Corolla lobes ovate, slightly unequal in length, 2–2.5 × 1–1.4 cm. Fruit brown to gray-brown, cylindrical, obovoid, or ellipsoid, 4.5–8 × 2.5–4 cm, glabrous or slightly pubescent, 3–10-ribbed, smooth between ribs, exocarp ca. 1 mm thick, mesocarp 0.8–1.2 cm thick, endocarp hard woody. Seeds 2–2.5 cm. Fl. Mar–Apr, fr. Jul–Sep.

* Dense forests; 100–1300 m. Guangdong, Guangxi, Hunan, Yunnan.

5. *Rehderodendron indochinense* H. L. Li, J. Arnold Arbor. 24: 369. 1934.

越南木瓜红 yue nan mu gua hong

Rehderodendron fengii Hu.

Trees 7–13 m tall. Branchlets red-brown, glabrous. Petiole 6–10 mm; leaf blade elliptic-lanceolate, oblong, or oblong-elliptic, 7–10 × 2.5–3.5 cm, membranous to papery, glabrous, base cuneate, margin serrulate, apex acuminate; secondary veins 6–9 per side, tertiary veins reticulate. Inflorescences axillary, racemes or panicles. Calyx campanulate, ca. 4 mm; teeth 5, deltoid. Corolla lobes elliptic to elliptic-oblong, ca. 1.4 cm × 5 mm, apex obtuse. Fruit red-brown, cylindrical, terete, 7.5–11 × 2.8–6 cm, often with brown rounded small spots when dried, 6–8-ribbed, smooth between ribs, exocarp ca. 1 mm thick, mesocarp 8–10 mm thick, endocarp hard woody. Seeds 2 or 3, ca. 2 cm. Fr. Aug–Oct.

Mixed forests; 100–1300 m. Yunnan (Pingbian Xian) [Vietnam].

shorter than anthers; inflorescences 3–4 cm, 10–20-flowered 1. *P. lacei*
1b. Calyx tube 2–3 mm; stamens 14–16; filaments only basally connate into a tube, free parts longer than
anthers; inflorescences 1–2 cm, 5- or 6-flowered 2. *P. macrophyllus*

1. *Parastyrax lacei* (W.W. Smith) W.W. Smith, Notes Roy. Bot. Gard. Edinburgh. 12: 232. 1920.

茉莉果 mo li guo

Styrax lacei W.W. Smith, Bull. Misc. Inform. Kew 1911: 344. 1911.

Trees to 15 m tall. Branchlets robust, grayish stellate pubescent or glabrous, prominently lenticellate. Petiole 1–1.5 cm; leaf blade elliptic to elliptic-oblong, 8–18 × 3–5 cm, papery to leathery, abaxially gray stellate pubescent, adaxially glabrous, base cuneate, margin entire or callose-denticulate; secondary veins 5–8 per side, tertiary veins reticulate, abaxially raised. Inflorescences spike like thyrses, 3–4 cm, 10–20-flowered. Flowers 1 cm. Pedicel 2 mm. Calyx ca. 1 × 2 mm, limb truncate to slightly undulate, densely stellate tomentose. Corolla lobes broadly lanceolate, 7–8 × 3–4 mm. Stamens 10; filaments ca. 6 mm, free part shorter than anthers, stellate tomentose. Drupe ellipsoid to broadly fusiform, with large lenticels, ca. 3 × 1 cm, with persistent calyx. Fl. Jun–Mar, fr. Jun–Aug.

Forest slopes; 800–1500 m. SW Yunnan [Myanmar].

2. *Parastyrax macrophyllus* C. Y. Wu & K. M. Feng, *Yunnan Redai Yaredai Zhiwu Quxi Yanjiu Baogao* (Rep. Stud. Pl. Trop. Subtrop. Yunnan) 1: 28. 1965.

大叶茉莉果 da ye mo li guo

Trees to 20 m tall. Trunk to 30 cm d.b.h. Branchlets densely stellate pubescent. Petiole 1–1.5 cm, robust, canaliculate; leaf blade elliptic to oblong-elliptic, 11–15(–27) × 5–7(–12.5) cm, almost leathery, sparsely stellate pubescent except veins glabrous, base broadly cuneate, margin entire, apex short acuminate to acute; secondary veins 10–14 per side, tertiary veins reticulate. Cymes crowded into a spike, 1–2 cm, 5- or 6-flowered; peduncle very short. Flowers ca. 1.2 cm. Calyx cupular, ca. 3 × 3 mm, limb truncate to undulate, densely stellate tomentose. Corolla tube ca. 2.5 mm; lobes oblong, ca. 8 × 3 mm. Stamens 14–16; filaments ca. 9 cm, sparsely white villose, free part longer than anther. Style ca. 8 mm, sparsely villose. Fl. Oct–Dec.

* Ravines in rain forests; 100–300 m. Yunnan (Kekou Xian).

