

2. EHRETIA P. Browne, Civ. Nat. Hist. Jamaica 168. 1756.

厚壳树属 hou ke shu shu

Trees or shrubs. Leaves petiolate, entire or serrate at margin. Inflorescences corymbose or paniculate-cymose. Calyx 5-lobed. Corolla white or pale yellow, tubular or tubular-campanulate, rarely funnelform, 5-lobed; lobes spreading or reflexed. Filaments usually exerted; anthers ovate to oblong or linear. Ovary ovoid, 2-loculed, each locule with 2 ovules. Style terminal, 2-cleft; stigmas 2, capitate or elongated. Drupes yellow, orange, or pale red, subglobose, glabrous, endocarp divided at maturity into 2 2-seeded or 4 1-seeded pyrenes.

About 50 species: mostly in Africa and S Asia, three in North America and the Caribbean; 14 species in China, mainly S of the Chang Jiang.

- 1a. Leaves serrate; endocarp divided at maturity into 2 2-seeded pyrenes.
 - 2a. Leaves glabrous, teeth antrorse, apiculate; corolla lobes longer than tube; drupes 3–4 mm in diam. 1. *E. acuminata*
 - 2b. Leaves pubescent abaxially, teeth spreading, not apiculate; corolla lobes shorter than tube; drupes 6–15 mm in diam.
 - 3a. Leaf base cuneate to rotund, blade pubescent adaxially; drupes 10–15 mm in diam. 3. *E. dicksonii*
 - 3b. Leaf base cordate, blade densely tomentose adaxially; drupes 3–4 mm in diam. 2. *E. corylifolia*
- 1b. Leaves entire; endocarp divided at maturity into 4 1-seeded pyrenes.
 - 4a. Corolla lobes longer than tube.
 - 5a. Inflorescences and calyx densely yellow-brown pubescent, ebracteate 14. *E. laevis*
 - 5b. Inflorescences glabrous or nearly so, with linear or linear-lanceolate bracts.
 - 6a. Petiole tuberculate; leaf blade broadly elliptic to oblong-elliptic, apex obtuse or mucronate; flowers pedicellate 12. *E. asperula*
 - 6b. Petiole smooth; leaf blade lanceolate to oblong-lanceolate, apex acute; flowers sessile 13. *E. hainanensis*
 - 4b. Corolla lobes shorter than tube.
 - 7a. Corolla tube cylindrical; calyx lobes linear, 5–6 mm.
 - 8a. Calyx 4–6 mm; stamens inserted at apex of corolla tube 4. *E. resinosa*
 - 8b. Calyx ca. 3 mm; stamens inserted at middle of corolla tube 5. *E. densiflora*
 - 7b. Corolla tube distinctly wider distally; calyx lobes ovate to oblong, 1.5–3.5 mm.
 - 9a. Cymes terminal; corolla funnelform, 5.5–6.5 mm; filaments ca. 1.5 mm 6. *E. confinis*
 - 9b. Cymes terminal and lateral; corolla tube campanulate, 7–11 mm; filaments ca. 3–6 mm.
 - 10a. Leaf blade with evident reticulate venation.
 - 11a. Inflorescences and calyx obscurely pubescent with glandular hairs 7. *E. tsangii*
 - 11b. Inflorescences and calyx with rust-colored glandular hairs 8. *E. dunniana*
 - 10b. Leaf blade with only midvein and lateral veins conspicuous.
 - 12a. Petiole, calyx, and corolla densely rust-colored pubescent 9. *E. pingbianensis*
 - 12b. Petiole and corolla glabrous, calyx ciliate.
 - 13a. Corolla 10–11 mm, lobes ovate; filaments 8–10 mm, inserted 3.5–5 mm above base 10. *E. longiflora*
 - 13b. Corolla 6.5–8 mm, lobes oblong-lanceolate; filaments 2.5–3 mm, inserted just below throat 11. *E. changjiangensis*

1. *Ehretia acuminata* R. Brown, Prodr. 147. 1810.

厚壳树 hou ke shu

Cordia thyrsoflora Siebold & Zuccarini; *Ehretia acuminata* var. *grandifolia* Pampanini; *E. acuminata* var. *obovata* (Lindley) I. M. Johnston; *E. argyi* H. Léveillé; *E. kantonensis* Masamune; *E. serrata* Roxburgh var. *obovata* Lindley; *E. taiwaniana* Nakai; *E. thyrsoflora* (Siebold & Zuccarini) Nakai.

Trees to 15 m tall; bark black-gray, lacinate; branches light brown, smooth; branchlets brown, glabrous, with distinct lenticels; axillary buds solitary, compressed. Petiole 1.5–2.5 cm, glabrous; leaf blade elliptic to obovate or oblong-obovate,

5–13 × 4–6 cm, glabrous or sparsely puberulent, base broadly cuneate, margin regularly serrate with teeth curved upward, apex acute, apiculate. Cymes paniculate, 8–15 × 5–8 cm, short pubescent or subglabrous. Flowers crowded, fragrant. Calyx 1.5–2 mm; lobes ovate, ciliate. Corolla white, campanulate, 3–4 mm; lobes spreading, oblong, longer than tube. Stamens exerted; filaments 2–3 mm, inserted on upper part of base, 0.5–1 mm; anthers ovate, ca. 1 mm. Style 1.4–2.5 mm, branches ca. 0.5 mm. Drupes yellow or orange, 3–4 mm in diam.; endocarp wrinkled, divided at maturity into 2 2-seeded pyrenes. 2n = 30, 32, 36.

Hills, open forests, thickets on slopes; 100–1700 m. Guangdong, Guangxi, Guizhou, Henan, Hunan, Jiangsu, Jiangxi, Shandong, Sichuan, Taiwan, Yunnan, Zhejiang [Bhutan, India,

Indonesia, Japan, Vietnam; Australia].

Ehretia acuminata is a widespread species with much variation. Chinese and Japanese plants named as *E. thyrsoiflora* are not specifically different from the Australian type, and the varieties recognized by Johnston (J. Arnold Arbor. 32: 21. 1951) show no geographical correlations. Attempts to subdivide the complex have not been successful, and it seems most appropriate to apply the specific epithet in a very wide sense.

Used for roadside plantings and the timber for building and furniture. The leaves and branchlets are used in Chinese medicine.

2. *Ehretia corylifolia* C. H. Wright, Bull. Misc. Inform. Kew 1896: 25. 1896.

西南厚壳树 xi nan hou ke shu

Trees ca. 12 m tall; bark black-gray; branches gray-brown, glabrous; branchlets and inflorescences densely pubescent. Leaf blade ovate or elliptic, 6–14 × 4–8 cm, abaxially soft puberulent or sparsely short pubescent, adaxially densely tomentose, base usually cordate, margin obtuse-serrate, apex acute. Cymes terminating branchlets, paniculate. Pedicel short or lacking. Calyx 2–3 mm, parted nearly to base; lobes oblong to lanceolate, pubescent. Corolla white, tubular-campanulate, fragrant, 6–9 mm; lobes oblong to rounded, 2.5–3.5 mm, shorter than tube, pubescent outside. Filaments ca. 2 mm; anthers oblong, 1.5–2 mm. Style 6–7.5 mm, pubescent, branches ca. 0.5 mm. Drupes red, yellow, or orange, 3–4 mm in diam.; endocarp ellipsoid to subglobose, ca. 7 mm, divided at maturity into 2 2-seeded pyrenes. Fl. May, fr. Jun-Jul.

- 1500–3000 m. NW, S and SW Yunnan.

3. *Ehretia dicksonii* Hance, Ann. Sci. Nat. Bot., ser. 4, 18: 224. 1862.

粗糠树 cu kang shu

Ehretia dicksonii var. *tomentosa* Nakai; *E. macrophylla* Wallich var. *tomentosa* Gagnepain & Courchet.

Trees ca. 15 m tall; bark gray-brown, fissured; branches brown; branchlets light brown, pubescent. Petiole 1–4 cm, pubescent; leaf blade broadly elliptic, elliptic, ovate, or obovate, 8–25 × 4–15 cm, abaxially densely and minutely hispid, hairs discoid at base, extremely scabrous, adaxially densely pubescent, base cuneate or rotund, margin serrate, apex acute. Cymes terminal, corymbose or paniculate, 6–9 cm wide, bracteate or not; bracts linear, ca. 5 mm. Flowers sessile or nearly so. Calyx 3.5–4.5 mm, parted nearly to base; lobes oblong or ovate, pubescent. Corolla white to pale yellow, tubular-campanulate, fragrant, 8–10 mm, base ca. 2 mm wide; throat 6–7 mm wide; lobes oblong, 3–4 mm, shorter than tube. Stamens exerted from corolla; filaments 3–4.5 mm; anthers 1.5–2 mm. Style 6–9 mm, glabrous, rarely appressed pubescent, branches 1–1.5 mm. Drupes yellow, subglobose, 1–1.5 cm in diam.; endocarp divided at maturity into 2 2-seeded pyrenes. Fl. Mar-May, fr. Jun-Jul. $2n = 40^*$.

Open forests on slopes, shaded moist hillsides; 100–2300 m. Fujian, S Gansu, Guangdong, Guangxi, Guizhou, Hainan, Henan, Hunan, Jiangsu, Jiangxi, S Qinghai, Shaanxi, Sichuan, Taiwan,

Yunnan, Zhejiang [Bhutan, Japan, Nepal, Vietnam].

Planted as an ornamental tree.

Plants with abaxially glabrous, shiny leaves have been recognized as *Ehretia macrophylla* Wallich var. *glabrescens* (Nakai) Y. L. Liu (Bull. Bot. Lab. N.E. Forest. Inst., Harbin 9: 71. 1980) [*E. dicksonii* Hance var. *glabrescens* Nakai (J. Arnold Arbor. 5: 40. 1924) or *E. dicksonii* var. *tilioides* I. M. Johnston (J. Arnold Arbor. 32: 101. 1951)] and occur in thickets and forests at 100–1700 m in Guangxi, Guizhou, Hubei, Sichuan, and Xizang.

4. *Ehretia resinosa* Hance, J. Bot. 18: 299. 1880.

台湾厚壳树 tai wan hou ke shu

Ehretia formosana Hemsley; *E. navesii* Vidal.

Shrubs or trees. Petiole 1–2 cm; leaf blade broadly ovate to rounded, 6–16 × 4–10 cm, abaxially pubescent, adaxially tomentose, base rounded, margin entire or dentate, apex acute. Cymes terminal, densely pubescent; peduncle 1–3 cm. Calyx 4–6 mm. Corolla tubular, ca. 3 mm. Stamens inserted at apex of corolla tube. Drupes globose, 5–7 mm in diam., usually 4-seeded. Fl. Apr.

Nanhai Zhudao, Taiwan [Philippines].

5. *Ehretia densiflora* F. N. Wei & H. Q. Wen, Guihaia 11: 216. 1991.

密花厚壳树 mi hua hou ke shu

Branches with reddish pubescent juvenile branchlets. Leaf blade elliptic, 5–11 × 2.5–5 cm, thick, papery; brown and puberulent when young, glabrous when mature, grayish green when dry; base acute, cuneate; veins 4, arcuate. Petiole 5–10 mm. Cymes terminal, thyrsoid, only 2–3 cm, densely brown woolly and white pubescent, many flowered; bracts 4–5 mm. Flowers ± sessile. Calyx ca. 3 mm; lobes lanceolate, brownish woolly. Corolla white, cylindric, 5-lobed; lobes rounded. Stamens inserted at middle of corolla tube. Ovary globose. Style single; stigma 2-lobed. Drupes ca. 3 mm in diam., divided at maturity into 4 1-seeded pyrenes. Fl. Jun-Jul.

- Guangxi.

6. *Ehretia confinis* I. M. Johnston, J. Arnold Arbor. 32: 103. 1951.

云南厚壳树 yun nan hou ke shu

Trees 5–10 m tall; branches pale, gray-brown, glabrous; branchlets brown, with linear or oblong lenticels, glabrous. Petiole 1–2 cm, glabrous; leaf blade oblong to elliptic or obovate, 5–8 × 2–4 cm, glabrous, base attenuate to rounded, margin entire or somewhat undulate, apex acute. Cymes terminal, dense, subglobose, ca. 4 cm wide. Corolla funnelliform, 5.5–6.5 mm. Filaments 5–6 mm, inserted ca. 1.5 mm above base of corolla tube; anthers ca. 1.2 mm. Drupes 5–7 mm in diam.; endocarp wrinkled, divided at maturity into 4 1-seeded pyrenes.

- Forests; 700–2400 m. SW Yunnan.

7. *Ehretia tsangii* I. M. Johnston, J. Arnold Arbor. 32: 104. 1951.

上思厚壳树 shang si hou ke shu

Trees 3–5 m tall; branches gray-brown; branchlets brown, glabrous, with linear or oblong lenticels. Leaf blade elliptic to oblong-elliptic, 5–12 × 3–6.5 cm, glabrous, abaxially pubescent only in vein axils, base cuneate, margin entire, apex abruptly acute; lateral veins 5 or 6 pairs, reticulate veins obvious. Cymes terminal and lateral, flat topped, 3–8 cm wide, obscurely pubescent. Calyx 1.5–2.5 mm, obscurely glandular pubescent; lobes ovate, 1–1.5 mm, ciliolate. Corolla white, tubular-campanulate, fragrant, 7–8.5 mm, base 1.5–2 mm wide, gradually expanded upward; throat 3–4.5 mm wide; lobes oblong, 3–4 mm, shorter than tube, margin revolute. Filaments 2.5–3.5 mm, inserted at upper part of base, 3–4 mm; anthers 1.5–2 mm. Style 5–6 mm, glabrous, branches ca. 1 mm. Drupes yellow, ca. 5 mm in diam.; endocarp divided at maturity into 4 1-seeded pyrenes. Fl. Mar, fr. Apr.

• Valley forests; 200–500 m. S and W Guangxi, S Guizhou, SE Yunnan.

8. *Ehretia dunniana* H. Léveillé, Repert. Spec. Nov. Regni Veg. 11: 65. 1912.

云贵厚壳树 yun gui hou ke shu

Ehretia volubilis Handel-Mazzetti.

Trees 10–15 m tall; branchlets dark brown, glabrous; young branches with thin glandular hairs. Petiole 2–3 cm, glabrous; leaf blade elliptic to oblong, 10–18 × 5–10 cm, glabrous, base broadly cuneate to rounded, apex abruptly acute; lateral veins 6–8 pairs, reticulate veins obvious. Cymes terminating lateral branches, flat topped, 6–7 cm wide, densely pubescent, glandular. Calyx 3–3.5 mm, densely thin glandular pubescent; lobes oblong, 1.2–2 mm, ciliolate. Corolla white, tubular-campanulate, 1–1.1 cm, fragrant, base 1–1.5 mm wide, gradually expanded upward; throat 4–4.5 mm wide; lobes oblong, 4–5 mm, obviously shorter than tube. Filaments 2.5–3 mm, inserted at upper part of base, 5.5–6 mm; anthers 1.5–2 mm. Style 8–8.5 mm, glabrous, branches 0.5–1 mm. Drupes red to dark red at maturity, ca. 1 cm in diam.; endocarp divided at maturity into 4 1-seeded pyrenes. Fl. Mar, fr. Apr.

• Open forests on slopes; ca. 1600 m. Guizhou, SE Yunnan.

Ehretia dunniana is very similar to *E. longiflora* Champion ex Benth, and differs by having conspicuous reticulate veins and densely rust-colored glandular inflorescences, calyces, and young branches. Léveillé (Repert. Spec. Nov. Regni Veg. 11: 65. 1912), described the cymes as “villous,” but Johnston (J. Arnold Arbor. 32: 104. 1951) indicated that they are densely covered with reddish brown, short, stipitate glands, as described here. Glands are also found in the type of *E. volubilis* Handel-Mazzetti.

9. *Ehretia pingbianensis* Y. L. Liu, Acta Phytotax. Sin. 22: 319. 1984.

屏边厚壳树 ping bian hou ke shu

Trees ca. 10 m tall; bark light brown to gray-brown, ± smooth; branchlets dark brown, glabrous. Petiole 1–2.5 cm, densely rust-colored pubescent; leaf blade elliptic to ovate or ovate-lanceolate, 7–10 × 4–6 cm, densely rust-colored pubescent, sometimes subglabrous, if glabrous then margin and veins pubescent, base broadly cuneate to rounded, apex obtuse to somewhat acute; lateral veins 6–8 pairs, reticulate veins inconspicuous. Cymes terminating lateral branches, crowded, flat topped, 3–6 cm wide at anthesis, densely rust-colored pubescent. Flowers sessile. Calyx campanulate, 2.5–3.5 mm, shorter than corolla tube, parted to middle or slightly below, densely rust-colored pubescent outside; lobes lanceolate or triangular-lanceolate, rarely oblong. Corolla white, tubular-campanulate, 1–1.1 cm, base ca. 1.5 mm wide; limb 4–5 mm wide; lobes oblong, 2–3.5 mm, recurved, densely rust-colored pubescent outside, margin revolute. Stamens exserted; filaments 6–7 mm, inserted at middle of corolla tube or slightly below; anthers oblong, 1–1.5 mm. Style 0.9–1.1 cm, exserted. Drupes unknown. Fl. Mar.

• Slopes, meadows, margins of cultivated ground; 800–1800 m. SW Yunnan.

10. *Ehretia longiflora* Champion ex Benth, Hooker's J. Bot. Kew Gard. Misc. 5: 58. 1853.

长花厚壳树 chang hua hou ke shu

Ehretia glaucescens Hayata.

Trees 5–10 m tall; bark dark gray to dark brown, scaly; branches brown; branchlets purple-brown, glabrous. Petiole 1–2 cm, glabrous; leaf blade elliptic to oblong or oblong-ob lanceolate, 3–12 × 2–6 cm, glabrous, base cuneate, rarely rounded, margin entire, apex acute; lateral veins 4–7 pairs, reticulate veins inconspicuous. Cymes terminating lateral branches, flat topped, 3–6 cm wide, glabrous or sparsely pubescent. Flowers sessile or on short pedicels. Calyx 1.5–2 mm, glabrous; lobes ovate, inconspicuously ciliate. Corolla white, tubular-campanulate, 1–1.1 cm, base ca. 1.5 mm wide, glabrous; throat 4–5 mm wide; lobes spreading or slightly recurved, ovate to elliptic-ovate, 2–3 mm, shorter than tube. Filaments 8–10 mm, inserted 3.5–5 mm above base; anthers ca. 1 mm. Style 7–8 mm, branches ca. 1 mm. Drupes pale yellow or red, 0.8–1.5 cm in diam.; endocarp ribbed, divided at maturity into 4 1-seeded pyrenes. Fl. Apr.

Open forests, slopes, moist valleys; 300–900 m. Fujian, Guangdong, Guangxi, Taiwan [Vietnam].

11. *Ehretia changjiangensis* Xing & Z. X. Li, Acta Phytotax. Sin. 31: 472. 1993.

昌江厚壳树 chang jiang hou ke shu

Shrubs climbing, to 3–6 m tall. Branches gray-brown, stout, glabrous. Petiole 2–9 mm, smooth; leaf blade oblong-elliptic or ovate, 1.5–5 × 0.5–2 cm, leathery, sparsely pubescent when young, later glabrescent, base cuneate, apex rounded. Cymes terminal, flat topped, 2–5 cm wide, densely pubescent, many flowered; peduncle 2–4 cm; bracts linear, 3–4 mm, caducous. Pedicel 1–1.5 mm. Calyx ca. 2.5 mm,

deeply lobed; lobes ca. 0.8 mm wide, sparsely pubescent, apex acute or rounded. Corolla white, tubular-campanulate, 6.5–8 mm, glabrous; tube ca. 5 mm, ca. 1.5 mm wide at base, 3–4 mm wide at throat; lobes oblong, 2–3 mm, apex rounded. Filaments 2.5–3 mm, inserted at throat, exerted; anthers oblong, ca. 1.2 mm, dorsifixed. Style ca. 7 mm; lobes ca. 1 mm, exerted. Drupes subglobose, 3–4 mm in diam. Seeds 4, conspicuously rugose.

- On limestone; ca. 300 m. Hainan.

Most closely related to *Ehretia asperula*, but distinguished by the smaller leaves with fewer lateral veins, smooth petioles, corolla lobes shorter than the tube, and long style.

12. *Ehretia asperula* Zollinger & Moritzi in Moritzi, Syst. Verz. 52. 1846.

宿苞厚壳树 su bao hou ke shu

Shrubs climbing, 3–5 m tall; branches gray-brown, stout, glabrous; branchlets brown or light brown, pubescent when young. Petiole 0.6–1.5 cm, tuberculate; leaf blade broadly elliptic to oblong-elliptic, 3–12 × 2–6 cm, leathery, glabrous or abaxially pubescent in vein axils, base rounded, margin usually entire, apex obtuse or mucronate. Cymes light brown, terminating branchlets, flat topped, 4–6 cm wide, pubescent; bracts linear to linear-oblong, 3–10 mm, sometimes curved, persistent. Pedicel 1.5–3 mm. Calyx brown, 1.5–2.5 mm, pubescent. Corolla white, funnelform, 3.5–4 mm, base ca. 1.5 mm wide; throat ca. 5 mm wide; lobes triangular-ovate, 2–2.5 mm, slightly longer than tube. Filaments 3.5–4 mm, inserted at upper part of base, ca. 1 mm; anthers ca. 1 mm. Style 3–4 mm, branches ca. 1 mm. Drupes red or orange, 3–4 mm in diam.; endocarp divided at maturity into 4 1-seeded pyrenes.

- Arid slopes, open forests. Hainan [Indonesia, Vietnam].

13. *Ehretia hainanensis* I. M. Johnston, J. Arnold Arbor. 32: 108. 1951.

海南厚壳树 hai nan hou ke shu

Trees ca. 8 m tall; bark gray; branchlets light gray, glabrous. Petiole 2–3 cm, glabrous; leaf blade lanceolate to oblong-lanceolate, 8–12 × 2–4 cm, base cuneate, margin entire, apex acute; lateral veins 4 or 5 pairs, reticulate veins inconspicuous. Cymes terminal and axillary, paniculate, 4–6 cm wide, glabrous; bracts lanceolate, 1.5–2 mm. Flowers sessile. Calyx ca. 1.5 mm; lobes ovate, ciliolate, apex acute. Corolla white, campanulate, ca. 3.5 mm, base ca. 1 mm wide; throat ca. 3 mm wide; lobes oblong, ca. 2 mm, slightly longer than tube, recurved. Filaments ca. 1.5 mm, inserted ca. 1.5 mm above base; anthers ca. 0.5 mm. Style ca. 2.5 mm, branches ca. 1.5 mm. Drupes unknown. Fl. Dec.

- Open forests; ca. 400 m. Hainan (Yaxian Xian).

14. *Ehretia laevis* Roxburgh, Pl. Coromandel 1: 42. 1796.

毛萼厚壳树 mao e hou ke shu

Ehretia laevis var. *platyphylla* Merrill.

Trees ca. 10 m tall; bark gray-brown; branches gray, scabrous, with elliptic lenticels; branchlets brown, densely pubescent. Petiole 1–2 cm, pubescent or subglabrous; leaf blade ovate-elliptic to obovate, 6–12 × 3–8 cm, abaxially with fascicled short hairs in vein axils, adaxially usually glabrous or pubescent near base, base rounded to broadly cuneate, margin entire, apex obtuse. Cymes terminal and axillary, sparsely dichotomously branched, 5–6 cm wide, densely yellow-brown pubescent, ebracteate. Flowers sessile. Calyx ca. 2 mm; lobes triangular. Corolla white, subrotate, ca. 3 mm; lobes reflexed, oblong, ca. 2 mm, longer than tube. Stamens exerted; filaments subulate, ca. 3 mm, inserted ca. 0.5 mm above base; anthers elliptic, ca. 0.5 mm. Style ca. 2 mm, branches ca. 0.5 mm. Drupes yellow or orange, 3–4 mm in diam.; endocarp wrinkled, divided at maturity into 4 1-seeded pyrenes. Fl. Feb–Apr. $2n = 26$.

Forest slopes, roadsides. Hainan (Baoting Xian, upper Chang Jiang) [Bhutan, India, Kashmir, Laos, Myanmar, Pakistan, Vietnam; Australia].

