

7. **TERNSTROEMIA** Mutis ex Linnaeus f., Suppl. Pl. 39, 264. 1782, nom. cons.

厚皮香属 hou pi xiang shu

*Dupinia* Scopoli; *Hoferia* Scopoli; *Mokof* Adanson; *Mokofua* Kuntze; *Taonabo* Aublet.

Shrubs or trees, evergreen, androdioecious. Leaves alternate but often clustered at apex of branchlets and pseudovercillate, margin entire or rarely serrate, petiolate. Flowers axillary, solitary or frequently several clustered on leafless branchlets, pedicellate. Bracteoles 2, alternate to subopposite, close to sepals, persistent or caducous. Sepals 5, imbricate, persistent or rarely caducous, margin glandular dentate, basally ± connate. Petals 5, imbricate, basally slightly connate. Stamens 30–50, in 1 or 2 whorls; filaments short and adnate to base of petals; anthers basifixed, oblong, glabrous, connective exerted. Ovary superior, 2–(or 5)-loculed with 2(–5) ovules per locule, placentation axile; style 1, apically 2(–4)-lobed. Fruit baccate, indehiscent or irregularly dehiscent with seeds dangling and probably dispersed by birds. Seeds reniform, slightly compressed, with a fleshy red outer layer; endosperm abundant.

About 90 species: tropical and subtropical Africa, America, and Asia; 13 species (ten endemic) in China.

- 1a. Leaf blade abaxially glandular punctate.
  - 2a. Leaf blade thickly leathery, midvein adaxially flat or only slightly impressed; bracteoles 4–5 mm; stamens ca. 6 mm ..... 3. *T. kwangtungensis*
  - 2b. Leaf blade leathery to thinly leathery, midvein adaxially distinctly impressed; bracteoles 1.5–3 mm; stamens 3.5–4.5 mm.
    - 3a. Leaf blade obovate to obovate-elliptic, 8–15 cm, secondary veins visible on both surfaces; fruit ca. 2 cm in diam., pedicel 1–1.5 cm and stout ..... 1. *T. yunnanensis*
    - 3b. Leaf blade elliptic to broadly elliptic, 3–9 cm, secondary veins obscure on both surfaces; fruit 1–1.3 cm in diam., pedicel 1.5–2.5 cm and slender ..... 2. *T. hainanensis*
- 1b. Leaf blade abaxially not glandular punctate.
  - 4a. Fruit globose to compressed globose.
    - 5a. Ovary 2-loculed, style apically 2-lobed; petals 6–10 mm.
      - 6a. Pedicel 2–3 cm, bracteoles 2.5–3 mm; petals 8–10 mm wide ..... 5. *T. luteoflora*
      - 6b. Pedicel 1–1.5 cm, bracteoles 1.5–2.5 mm; petals 4–6 mm wide ..... 7. *T. gymnanthera*
    - 5b. Ovary 4-loculed, style apically 4-lobed; petals 10–18 mm.
      - 7a. Petiole 1.5–3 cm, bracteoles 4–6 mm; sepals 10–14 mm; fruit 1.6–3 cm in diam. .... 4. *T. insignis*
      - 7b. Petiole 1–1.5 cm, bracteoles ca. 2.5 mm; sepals 5–6.5 mm; fruit ca. 1.5 cm in diam. .... 6. *T. biangulipes*
  - 4b. Fruit ovoid, long ovoid, conic, or ellipsoid.
    - 8a. Fruit ovoid, long ovoid, or conic, widest basally, apex acute.
      - 9a. Leaf blade adaxially becoming blackish brown when dry; sepals ovate to oblong-ovate, both surfaces golden punctate ..... 8. *T. nitida*
      - 9b. Leaf blade adaxially becoming light green when dry; sepals ovate-orbicular, suborbicular, ovate-oblong, oblong, both surfaces not punctate.
        - 10a. Petiole 1–2 cm; leaf blade elliptic to broadly elliptic, secondary veins visible or slightly raised on both surfaces; pedicel 1.5–3 cm; sepals ovate-orbicular to suborbicular, 6–8 × 5–7 mm; fruit 1.5–2 × 1–1.3 cm, persistent sepals ca. 8 × 7 mm ..... 9. *T. conicocarpa*
        - 10b. Petiole 0.5–1 cm; leaf blade elliptic to oblong-elliptic, secondary veins obscure on both surfaces; pedicel 1–1.5 cm; sepals ovate-oblong to oblong, 3–4.5 × 2–3.5 mm; fruit 1–1.2 × ca. 0.8 cm, persistent sepals 4–5 × 3–3.5 mm ..... 10. *T. sichuanensis*
    - 8b. Fruit ellipsoid, widest at middle, apex obtuse.
      - 11a. Petiole 10–15 mm; leaf blade 6–9.5 cm, secondary veins 6–9 on each side of midvein; petals yellow ..... 11. *T. simaoensis*
      - 11b. Petiole 3–10 mm; leaf blade 2–7 cm, secondary veins 3–6 on each side of midvein; petals white or pale yellowish white.
        - 12a. Petiole 5–10 mm; leaf blade elliptic, obovate-elliptic, or broadly elliptic, (4–)5–7 cm, secondary veins 4–6 on each side of midvein; pedicel 1–1.5 cm; petals 4.5–5 × 5–5.5 mm; fruit 12–15 × ca. 10 mm ..... 12. *T. japonica*
        - 12b. Petiole ca. 3 mm; leaf blade obovate, obovate-oblong, or oblanceolate, 2–5(–6.5) cm, secondary veins 3–4 on each side of midvein; pedicel 0.5–1 cm; petals ca. 4 × 3.5 mm; fruit 8–10 × 5–6 mm ..... 13. *T. microphylla*

1. **Ternstroemia yunnanensis** L. K. Ling, Fl. Reipubl. Popu- 云南厚皮香 yun nan hou pi xiang  
laris Sin. 50(1): 182. 1998.

Trees 5–12 m tall. Young branches grayish brown; current

year branchlets reddish brown, glabrous. Petiole 1–1.5 cm, glabrous, adaxially grooved; leaf blade obovate to obovate-elliptic, 8–15 × 4–7 cm, leathery, abaxially pale green and dark red glandular punctate, adaxially dark green and shiny, both surfaces glabrous and becoming reddish brown when dry, midvein abaxially elevated and adaxially impressed, secondary veins 7–9 on each side of midvein, abaxially slightly raised, and adaxially visible, base broadly cuneate, margin entire to obscurely serrate and slightly revolute, apex acute to abruptly shortly acuminate and with an obtuse tip. Flowers axillary and solitary or 5–10 congested on leafless branchlets. Pedicel ca. 1.5 mm, thickening toward apex. Male flowers (not yet open): bracteoles triangular to ovate-triangular, 1.5–2.5 × 1.5–2.5 mm, margin glandular dentate, apex acute; sepals ovate to suborbicular, 5–6 × 4–5 mm, margin densely glandular dentate, apex rounded; petals broadly obovate, ca. 5 × 4–5 mm; stamens ca. 50, ca. 3.5 mm; filaments short; anthers oblong, ca. 2 mm; pistillode small, glabrous. Bisexual flowers: bracteoles and sepals similar to those of male flowers but larger; petals obovate, 8–9 mm, basally connate for ca. 1 mm, apex emarginate; ovary globose, usually 2-loculed with 2 ovules per locule; style persistent, ca. 2.5 mm, apically 2-parted. Fruit purplish red when mature, globose, ca. 2 cm in diam., 2-loculed with 2 seeds per locule. Seeds compressed ellipsoid, 10–14 × ca. 6 mm. Fl. May–Jun, fr. Oct–Nov.

• Forests on mountain slopes or in valleys; 1100–1800 m. Yunnan (Hekou, Jinping, Pingbian).

**2. *Ternstroemia hainanensis*** Hung T. Chang, Acta Sci. Nat. Univ. Sunyatseni 9(4): 134. 1963.

海南厚皮香 hai nan hou pi xiang

Trees 10–25 m tall. Young branches grayish brown, glabrous. Petiole 1–1.6 cm, glabrous; leaf blade elliptic to broadly elliptic, 3–9 × 2.5–4.5 cm, leathery, abaxially pale green and densely dark red glandular punctate, adaxially dark green and shiny, both surfaces glabrous, midvein abaxially elevated and adaxially impressed, secondary veins 5–8 on each side of midvein and obscure on both surfaces or adaxially slightly impressed, reticulate veins obscure, base cuneate, margin slightly revolute and entire or rarely apically serrate, apex abruptly acute to shortly acuminate. Flowers axillary and solitary or often several clustered on leafless branchlets. Pedicel 1–1.5 cm, slightly recurved, glabrous. Male flowers: bracteoles 2, triangular-ovate, ca. 3 mm; sepals ovate-orbicular, ca. 5 × 4 mm, margin glandular dentate, apex rounded; petals white, broadly obovate, ca. 7 × 6 mm, apex rounded; stamens ca. 36, ca. 4.5 mm; anthers oblong, ca. 3 mm; pistillode very small. Bisexual flowers not seen. Fruit subglobose, 1–1.3 × 1–1.5 cm, 4-loculed with 1 seed per locule; pedicel 1–2.5 mm; persistent bracteoles triangular, ca. 3 mm, apex acute; persistent sepals ovate-orbicular, 5–6 mm, apex rounded. Seeds reniform-oblate, 5–6 mm in diam. Fl. May–Jun, fr. Aug–Oct.

• Forests on mountain slopes or in valleys; 900–1400 m. Hainan.

**3. *Ternstroemia kwangtungensis*** Merrill, Philipp. J. Sci. 13: 148. 1918.

厚叶厚皮香 hou ye hou pi xiang

*Ternstroemia pachyphylla* L. K. Ling (1951), not Krug & Urban (1896); *T. subrotundifolia* Hung T. Chang.

Shrubs or trees, 2–10 m tall. Bark grayish brown to blackish brown, smooth. Young branches grayish brown; current year branchlets reddish brown, glabrous. Petiole 1–2 cm, stout, glabrous; leaf blade broadly elliptic to obovate, (5–)8–11(–13) × (3–)4–6.5 cm, thickly leathery, abaxially pale green and densely reddish brown or brown glandular punctate, adaxially dark green and shiny, both surfaces glabrous, midvein abaxially elevated and adaxially flat or slightly impressed, secondary veins 5–7 on each side of midvein and obscure on both surfaces or adaxially visible, base broadly cuneate to obtuse, margin entire or rarely apically sparsely serrate, apex abruptly shortly acute and with an obtuse tip. Flowers axillary, solitary. Pedicel 1.5–2 cm, slightly recurved, glabrous. Male flowers: bracteoles ovate, triangular-ovate, or ovate, 4–5 × ca. 3 mm, margin sparsely glandular dentate; sepals ovate to suborbicular, 6–8 × 6–8 mm, glabrous, margin glandular dentate, apex rounded; petals white, obovate to oblong-obovate, ca. 10 × 8 mm, apex rounded and retuse; stamens numerous, ca. 6 mm; anthers ovate, ca. 3 mm; pistillode very small. Bisexual flowers not seen. Fruit compressed-globose, 1.5–1.8 × 1.6–2 cm, 3–4(–5)-loculed with 1 seed per locule; pedicel 1.5–2 cm, ca. 3 mm thick; persistent bracteoles triangular-ovate, ca. 3 × 4 mm; persistent sepals suborbicular, 6–7 × 6–7 mm; persistent style 1–2 mm, apically 3- or 4(or 5)-lobed. Seeds subreniform, 7–8 × ca. 6 mm. Fl. May–Jun, fr. Oct–Nov.

Forests on mountain slopes, thickets along streams; 700–1700 m. Fujian, Guangdong, S Guangxi, Jiangxi [Vietnam].

**4. *Ternstroemia insignis*** Y. C. Wu, Bot. Jahrb. Syst. 71: 195. 1940.

大果厚皮香 da guo hou pi xiang

*Adinandra bracteata* H. L. Li.

Trees 9–15 m tall. Bark grayish brown, smooth. Young branches gray to grayish brown, glabrous. Petiole 1.5–3 cm, stout; leaf blade obovate to obovate-elliptic, 7–13.5 × 3–5.5 cm, leathery, abaxially pale green becoming reddish brown when dry, adaxially green, shiny, and becoming pale brown when dry, both surfaces glabrous, midvein abaxially elevated and adaxially impressed, secondary veins 9–11 on each side of midvein and visible to slightly raised on both surfaces, base cuneate, margin entire, apex acute to shortly acuminate and with an obtuse tip. Flowers axillary, solitary or several clustered on leafless branchlets. Pedicel 1.5–2.5 cm, stout, slightly recurved. Male flowers: bracteoles persistent, ovate, 4–6 × 3.5–5 mm, glabrous, margin membranous and lacerately glandular dentate, apex acute to rounded; sepals persistent, orbicular to ovate, 1–1.4 × 1–1.4 cm, glabrous, margin membranous and entire or sparsely lacerate glandular dentate, apex rounded to retuse; petals white, obovate, 1.2–1.8 × 1–1.6 cm, basally slightly connate, apex rounded and retuse; stamens 5–8 mm; anthers oblong, 3–5 mm; pistillode obscure. Bisexual flowers: bracteoles, sepals, and petals similar to those of male flowers; ovary ovoid, 4-loculed with 2 ovules per locule; style ca. 1.5 mm, apically 4-lobed. Fruit globose to compressed globose, 2–2.5 × 1.6–3 cm,

4-loculed with 2 seeds per locule; persistent style 2–5 mm, apically 4-lobed. Seeds oblong-reniform, 10–12 × 4.5–5 mm. Fl. Jun–Jul, fr. Aug–Oct.

• Forests, forest margins; 800–2600 m. N Guangxi, SW Guizhou, SE Yunnan.

**5. *Ternstroemia luteoflora*** L. K. Ling, Fl. Reipubl. Popularis Sin. 50(1): 183. 1998.

尖萼厚皮香 jian e hou pi xiang

Trees 4–8 m tall. Bark grayish white. Current year branchlets purplish brown, glabrous. Petiole 1–1.5 cm, adaxially grooved; leaf blade oblong-elliptic, oblong-lanceolate, or rarely obovate-elliptic, 5–11 × 2.5–3.5(–4.5) cm, leathery, abaxially pale green becoming reddish brown when dry, adaxially dark green, shiny, and becoming yellowish green when dry, both surfaces glabrous, midvein abaxially elevated and adaxially impressed, secondary veins obscure on both surfaces, base cuneate, margin entire and slightly revolute, apex shortly acuminate and with an obtuse tip. Flowers ca. 1.5 cm in diam. Pedicel 2–3 cm, ± incurved; bracteoles 2, ovate-lanceolate, 2.5–3 mm, apex acuminate. Sepals long ovate, 5–7 × 3–4 mm, margin glandular ciliolate, apex acuminate to long acuminate. Petals white or pale yellow, obovate, 8–10 × 8–10 mm, apex retuse. Male flowers: stamens 35–45, ca. 5 mm; anthers oblong, ca. 4 mm; ovary reduced to a pistillode. Bisexual flowers: ovary globose, 2-loculed with 2 ovules per locule; style apically 2-cleft. Fruit globose, 1.5–2 cm in diam., 2-loculed with 2 seeds per locule. Seeds ellipsoid, ca. 8 × 6 mm. Fl. May–Jun, fr. Aug–Oct.

• Forests; 400–1500(–1900) m. Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, SE Yunnan.

**6. *Ternstroemia biangulipes*** Hung T. Chang, Acta Sci. Nat. Univ. Sunyatseni 22(3): 65. 1983.

角柄厚皮香 jiao bing hou pi xiang

*Ternstroemia longipedicellata* L. K. Ling.

Shrubs or trees, 4–15 m tall. Young branches reddish brown, glabrous, white lenticellate. Petiole 1–1.5 cm, glabrous; leaf blade oblong to oblong-elliptic, (7–)8.5–16 × (2–)3.5–6.2 cm, leathery, abaxially pale green but reddish brown when dry, adaxially dark green but brown and shiny when dry, both surfaces glabrous, midvein abaxially elevated and adaxially impressed, secondary veins 7–10 on each side of midvein and visible or obscure on both surfaces, base cuneate, margin entire and slightly revolute, apex acuminate to shortly acuminate and with an acute tip. Flowers axillary, solitary or several clustered on leafless branchlets, ca. 2 cm in diam. Pedicel 1.5–3 cm, compressed, longitudinally 2-ribbed. Male flowers similar to bisexual flowers but ovary reduced to a pistillode. Bisexual flowers: bracteoles 2, caducous before anthesis, lanceolate, ca. 2.5 mm, apex acuminate; sepals elliptic to broadly elliptic, 5–6.5 × 4–5.5 mm, glabrous, margin glandular dentate, apex obtuse or rounded; petals white or pale pink, broadly obovate, 10–11 × ca. 9 mm, basally slightly connate, apex emarginate; stamens ca. 5.5 mm; anthers oblong, ca. 3 mm; ovary globose, 4- or 5-loculed; style 1.5–2 mm, apically 4- or 5-parted; stigma capitate. Fruit globose, ca. 1.5 cm in diam., 4-loculed with 2

seeds per locule. Seeds ellipsoid, slightly compressed, ca. 8 × 4.5 mm. Fl. Jul–Aug, fr. Oct–Nov.

• Forests on mountain slopes; 1300–2600 m. Xizang (Mèdog), NW Yunnan.

This species is expected to be found in N Myanmar.

**7. *Ternstroemia gymnanthera*** (Wight & Arnott) Beddome, Fl. Sylv. S. India 91. 1871.

厚皮香 hou pi xiang

Shrubs 1.5–10(–15) m tall. Bark grayish brown, smooth. Young branches grayish brown; current year branchlets purplish red to reddish brown, glabrous. Petiole 0.7–1.3 cm, glabrous, adaxially grooved; leaf blade obovate, oblong-obovate, or broadly elliptic, (3–)4–12 × 1.5–5.5 cm, leathery, abaxially pale green becoming reddish brown when dry, adaxially dark green and shiny, both surfaces glabrous, midvein abaxially elevated and adaxially impressed, secondary veins 5–7 on each side of midvein and obscure on both surfaces, base cuneate, margin entire or apically sparsely serrate, apex acute to shortly acuminate and with an obtuse tip. Flowers axillary, solitary or several clustered on leafless branchlets, 1–1.8 cm in diam. Pedicel 1–1.5 cm, recurved. Male flowers similar to bisexual flowers but ovary reduced to a pistillode. Bisexual flowers: bracteoles triangular to triangular-ovate, 1.5–2.5 mm, margin glandular dentate, apex acute; sepals ovate to long ovate, 4–7 × 3–4 mm, glabrous, margin glandular dentate, apex rounded; petals pale yellow, obovate, 6–9 × 4–6 mm, apex rounded and retuse; stamens 4–5 mm; anthers oblong, longer than filaments; ovary ovoid, 2-loculed with 2 ovules per locule; style 1–3 mm, apically 2-lobed. Fruit purplish red when mature, globose, 1–1.5 cm in diam., 2-loculed with 1 or 2 seeds per locule. Seeds reniform, ca. 6 × 4 mm. Fl. May–Jul, fr. Sep–Nov.

Forests, thickets; 200–2800 m. Anhui, Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang [Bhutan, Cambodia, India, Laos, Myanmar, Nepal, Thailand, Vietnam].

The name *Ternstroemia gymnanthera* has often been mistakenly applied to other *Ternstroemia* species in the literature.

- 1a. Leaf blade (3–)4–9 × 1.5–3.5 cm, margin entire; flowers ca. 1 cm in diam.; fruit ca. 1 cm in diam. .... 7a. var. *gymnanthera*
- 1b. Leaf blade 10–12 × 3.5–5.5 cm, margin apically sparsely serrate; flowers 1.5–1.8 cm in diam.; fruit ca. 1.5 cm in diam. .... 7b. var. *wightii*

**7a. *Ternstroemia gymnanthera* var. *gymnanthera***

厚皮香(原变种) hou pi xiang (yuan bian zhong)

*Cleyera gymnanthera* Wight & Arnott, Prodr. Fl. Ind. Orient. 87. 1834; *Hoferia japonica* Franchet; *Ternstroemia parvifolia* Hu; *T. pseudomicrophylla* Hung T. Chang.

Leaf blade (3–)4–9 × 1.5–3.5 cm, margin entire. Flowers ca. 1 cm in diam. Fruit ca. 1 cm in diam. Fl. May–Jul, fr. Sep–Nov.

Forests, thickets; 200–2800 m. Anhui, Fujian, Guangdong, Guang-

xi, Guizhou, Hubei, Hunan, Jiangxi, Sichuan, Yunnan, Zhejiang [Bhutan, Cambodia, India, Laos, Myanmar, Nepal, Vietnam].

**7b. *Ternstroemia gymnanthera* var. *wightii*** (Choisy) Handel-Mazzetti, Symb. Sin. 7: 397. 1931.

阔叶厚皮香 *kuo ye hou pi xiang*

*Cleyera wightii* Choisy, Mém. Soc. Phys. Genève 14: 115. 1855; *Ternstroemia japonica* (Thunberg) Thunberg var. *wightii* (Choisy) Dyer.

Leaf blade 10–12 × 3.5–5.5 cm, margin apically sparsely serrate. Flowers 1.5–1.8 cm in diam. Fruit ca. 1.5 cm in diam. Fl. May–Jun, fr. Sep–Nov.

Forests, thickets; 1400–2800 m. Guangdong, Guangxi, Guizhou, Hubei, Hunan, Sichuan, Yunnan [India].

**8. *Ternstroemia nitida*** Merrill, J. Arnold Arbor. 8: 10. 1927.

亮叶厚皮香 *liang ye hou pi xiang*

Shrubs or trees, 2–8(–12) m tall. Bark grayish brown, smooth. Young branches grayish brown, glabrous. Petiole 1–1.5 cm, glabrous; leaf blade oblong-elliptic to oblong-ovate, 6–10 × 2.5–4 cm, papery to thinly leathery, abaxially pale green, adaxially dark green, shiny, and becoming blackish brown when dry, both surfaces glabrous, midvein abaxially elevated and adaxially impressed, secondary veins 7–9 on each side of midvein, abaxially obscure, and adaxially slightly impressed, base cuneate, margin entire, apex acuminate. Flowers axillary, usually solitary. Pedicel 1.5–2 cm, slender, glabrous. Male flowers similar to bisexual flowers but ovary reduced to a pistillode. Bisexual flowers: bracteoles ovate-triangular, ca. 2 × 1.7 mm, margin sparsely glandular dentate, apex acute; sepals ovate to oblong-ovate, 3–5 × 2.5–3.5 mm, both surfaces golden punctate, apex obtuse to rounded; petals white or pale yellow, broadly obovate to oblong-ovate, 5–7 × 4–5 mm, apex rounded; stamens 25–45, 3.5–4.5 mm; anthers oblong, 2–2.5 mm; ovary ovoid, glabrous, 2-loculed with 1 ovule per locule; style apically 2-parted. Fruit purplish red when mature, long ovoid, 10–12 × 8–9 mm. Seeds compressed ovate, 5–6 × 4–5 mm. Fl. Jun–Jul, fr. Aug–Sep.

• Forests on mountain slopes or along streams; 200–900 m. Anhui, Fujian, N Guangdong, NE Guangxi, E Guizhou, S and W Hunan, Jiangxi, S Zhejiang.

**9. *Ternstroemia coniocarpa*** L. K. Ling, Fl. Reipubl. Popularis Sin. 50(1): 185. 1998.

锥果厚皮香 *zhui guo hou pi xiang*

Shrubs or trees, 3–12 m tall. Young branches grayish brown, glabrous. Petiole 1–2 cm, glabrous; leaf blade elliptic to broadly elliptic, 6–10 × 2.8–5.3 cm, leathery, abaxially pale green, adaxially dark green and shiny, both surfaces glabrous, midvein abaxially elevated and adaxially slightly impressed, secondary veins 6–8 on each side of midvein, slender, and visible or slightly raised on both surfaces, reticulate veins obscure, base broadly cuneate and ± decurrent, margin entire, apex shortly acuminate to acute and with an obtuse tip. Flowers axillary, solitary. Male flowers (not yet open): pedicel 1.5–3 cm,

slightly compressed, glabrous; bracteoles ovate, ca. 2.5 × 2 mm, apex acute; sepals ovate-orbicular to suborbicular, 6–8 × 5–7 mm, glabrous, apex rounded to emarginate; petals white, broadly obovate, ca. 7 × 7–8 mm; stamens more than 50; filaments ca. 1 mm; anthers oblong, ca. 3 mm; pistillode evident. Bisexual flowers not seen. Fruit ovoid to conic, 1.5–2 × 1–1.3 cm, 2-loculed with 1 seed per locule; pedicel 1.5–3 cm; persistent bracteoles ovate, ca. 2.5 mm; persistent sepals ovate-orbicular, ca. 8 × 7 mm. Seeds ovoid-ellipsoid, ca. 10 × 5 mm. Fl. May–Jun, fr. Sep–Oct.

• Forests on hills, slopes, or along streams; 300–500 m. NW Guangdong, NE Guangxi, S Hunan.

**10. *Ternstroemia sichuanensis*** L. K. Ling, Fl. Reipubl. Popularis Sin. 50(1): 186. 1998.

四川厚皮香 *si chuan hou pi xiang*

Shrubs or trees, 3–8 m tall. Bark blackish brown, smooth. Young branches grayish brown; current year branchlets reddish brown, glabrous. Petiole 5–10 mm; leaf blade elliptic to oblong-elliptic, 6–9 × 2.8–4 cm, leathery to thinly leathery, abaxially pale green to pale yellowish green, adaxially dark green, both surfaces glabrous, midvein abaxially elevated and adaxially impressed, secondary veins 6 or 7 on each side of midvein and obscure, base broadly cuneate to rarely cuneate, margin entire, apex shortly acuminate to acute and with an obtuse tip. Flowers axillary, solitary or several clustered on leafless branchlets. Pedicel 1–1.5 cm, slender, thickening toward apex. Male flowers: bracteoles ovate-triangular to ovate-lanceolate, 1–2.5 × 1–1.5 mm, apex acute; sepals ovate-oblong to oblong, 3–4.5 × 2–3.5 mm, margin glandular dentate, apex rounded to obtuse; petals pale yellow, obovate, 6–7 × ca. 6 mm, apex rounded to slightly emarginate; stamens ca. 45, 4–5 mm; anthers oblong, 2–2.5 mm; pistillode very small. Bisexual flowers not seen. Fruit purplish red when mature, ovoid, 10–12 × ca. 8 mm, 2-loculed with 2 seeds per locule, apex acute; pedicel 1–1.5 cm; bracteoles persistent; persistent sepals oblong, 4–5 × 3–3.5 mm; persistent style ca. 1 mm, apically 2-parted. Seeds long ovate-semiorbicular, ca. 7 × 4 mm. Fl. Jun–Jul, fr. Aug–Oct.

• Forests or thickets on mountain slopes; 600–1800 m. Guizhou, Sichuan.

**11. *Ternstroemia simaoensis*** L. K. Ling, Fl. Reipubl. Popularis Sin. 50(1): 187. 1998.

思茅厚皮香 *si mao hou pi xiang*

Shrubs or trees, 2–10 m tall. Young branches grayish brown; current year branchlets purplish brown, glabrous. Petiole 1–1.5 cm, glabrous, adaxially grooved; leaf blade oblong to obovate-oblong, 6–9.5 × 2.5–3.5 cm, thinly leathery, abaxially pale green becoming pale brown or reddish brown when dry, adaxially dark green and shiny, both surfaces glabrous, midvein abaxially elevated and adaxially impressed, secondary veins 6–9 on each side of midvein and visible to slightly raised on both surfaces, base cuneate to broadly cuneate, margin entire or apically sparsely serrate, apex acute and with an obtuse tip. Flowers axillary, solitary or several clustered on leafless branches. Pedicel 1–1.5 cm. Male flowers: bracteoles triangular to triangular-ovate, ca. 1.5 × 1 mm, margin glandular dentate; sepals

broadly elliptic to suborbicular, ca.  $3 \times 2$  mm, margin glandular dentate, apex rounded; petals yellow, broadly obovate to ovate, ca.  $5 \times 4$  mm; stamens 45–50 or more, 2–3.5 mm; anthers ca. 1 mm; pistillode very small. Bisexual flowers: bracteoles, sepals, and petals similar to those of male flowers; stamens ca. 45; ovary ovoid, 2-loculed with 2 ovules per locule; style short, apically 2-parted. Fruit ellipsoid,  $10\text{--}12 \times 7\text{--}9$  mm, 2-loculed with 1 seed per locule. Seeds obliquely ovoid, ca.  $8 \times 5$  mm. Fl. May–Jun, fr. Oct–Nov.

- Forests on mountain slopes; 700–1800 m. S Yunnan.

**12. Ternstroemia japonica** (Thunberg) Thunberg, Trans. Linn. Soc. London 2: 335. 1794.

日本厚皮香 ri ben hou pi xiang

*Cleyera japonica* Thunberg, Nov. Gen. Pl. 69. 1783; *C. dubia* Champion; *C. fragrans* Champion; *Mokofua japonica* (Thunberg) Kuntze; *Taonabo japonica* (Thunberg) Szyszylowicz; *Ternstroemia dubia* (Champion) Choisy; *T. fragrans* (Champion) Choisy; *T. mokof* Nakai.

Shrubs or trees, 3–10 m tall. Bark grayish brown or dark brown, smooth. Young branches grayish brown; current year branchlets reddish brown, glabrous. Petiole 5–10 mm, glabrous; leaf blade elliptic, obovate-elliptic, or broadly elliptic,  $(4\text{--})5\text{--}7 \times (1.4\text{--})2.2\text{--}3$  cm, leathery, abaxially pale green or glaucous green, adaxially dark green, both surfaces glabrous, midvein abaxially elevated and adaxially impressed, secondary veins 4–6 on each side of midvein, abaxially visible or obscure, and adaxially slightly impressed, base cuneate, margin entire, apex acute and with an obtuse to retuse tip. Flowers axillary, solitary or several clustered on leafless branches. Male flowers similar to bisexual flowers but ovary reduced to a pistillode. Bisexual flowers 1–1.5 cm in diam.; pedicel 1–1.5 cm; bracteoles 2, triangular-ovate, ca. 1.5 mm, apex acute to acuminate; sepals broadly ovate to suborbicular, ca.  $3 \times 3\text{--}3.5$  mm, margin lacerrately serrate, apex rounded; petals white or pale yellowish

white, broadly obovate,  $4.5\text{--}5 \times 5\text{--}5.5$  mm; stamens 40–45, ca. 4.5 mm; anthers oblong, 2.5–3 mm, connective exerted; ovary elliptic-ovoid, 2-loculed with 2–3 ovules per locule; style apically 2-lobed. Fruit ellipsoid,  $1.2\text{--}1.5 \times$  ca. 1 cm, 2-loculed with 2(or 3) seeds per locule. Seeds long reniform, ca.  $5 \times 3$  mm. Fl. Jun–Jul, fr. Oct–Nov.

Evergreen broad-leaved forests; middle elevations. Taiwan [Japan].

The type specimen and Thunberg's original description of *Cleyera japonica* include elements of both *Cleyera* and *Ternstroemia*. Thunberg subsequently transferred *C. japonica* to *Ternstroemia* but without resolving the problem of the name being based on two different elements. Siebold and Zuccarini (Fl. Jap. 148. 1841) emended Thunberg's description of *T. japonica* to include only the *Ternstroemia* element. See also the discussion under the genus *Cleyera* and under *C. japonica*.

**13. Ternstroemia microphylla** Merrill, Sunyatsenia 3: 254. 1937.

小叶厚皮香 xiao ye hou pi xiang

*Ternstroemia oblancilimba* Hung T. Chang; *T. pseudoverticillata* Merrill & Chun.

Shrubs or trees, 1–6(–10) m tall. Young branches slender, grayish brown, glabrous. Petiole ca. 3 mm, glabrous; leaf blade obovate, oblong-obovate, or oblanceolate, rarely narrowly elliptic to narrowly elliptic-oblanceolate,  $2\text{--}5(6.5) \times 0.6\text{--}1.5(3)$  cm, leathery to thickly leathery, abaxially pale green, adaxially green and shiny, both surfaces glabrous, midvein abaxially elevated and adaxially impressed, secondary veins 3 or 4(or 5) on each side of midvein and obscure on both surfaces or adaxially slightly impressed, base cuneate, margin apically sparsely serrulate to subentire, apex acute, obtuse, or rounded. Flowers axillary, solitary or several clustered on leafless branchlets, 5–8 mm in diam. Pedicel 5–10 mm, slender, glabrous. Male flowers: bracteoles, sepals, and petals similar to bisexual flowers; stamens 35–45; pistillode very small. Bisexual flowers: bracteoles ovate-triangular, ca. 1 mm, margins glandular dentate, apex acute; sepals ovate-orbicular,  $2\text{--}3 \times 2\text{--}3$  mm, margin sparsely glandular dentate, apex rounded; petals white, broadly obovate, ca.  $4 \times 3.5$  mm; stamens 35–45, ca. 3 mm; anthers oblong, ca. 1.5 mm; ovary ovoid, 2-loculed with 1 ovule per locule; style short, apically 2-lobed. Fruit ellipsoid,  $8\text{--}10 \times 5\text{--}6$  mm, 2-loculed with 1 seed per locule. Seeds long reniform, 5–7 mm. Fl. May–Jun, fr. Aug–Oct.

- Thickets, hills, rock crevices; below 100–1000 m. E Fujian, Guangdong, S Guangxi, Hainan.

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