

## 24. CRYPTOCARYA R. Brown, Prodr. 402. 1810, nom. cons.

厚壳桂属 hou ke gui shu

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*Ravensara* Sonnerat.

Trees or shrubs, evergreen. Bud scales few, leaflike. Leaves alternate, rarely subopposite, usually pinninerved, rarely triplinerved. Flowers bisexual, small, arranged into a subterminal and usually short panicle. Perianth tube turbinate or ovoid, persistent, contracted on top after caducous. Fertile stamens 9, inserted on throat of perianth tube; filaments of 1st and 2nd whorls glandless, those of 3rd whorl each with 2 glands at base; anthers 2-celled; cells of 1st and 2nd whorls introrse, those of 3rd whorl extrorse. Staminodes of innermost whorl, shortly stalked, glandless. Ovary sessile, enveloped by perianth tube; style sublinear; stigma small, inconspicuous, rarely peltate. Fruit drupelike, globose, ellipsoid, or oblong, wholly enveloped by fleshy or hard and dilated perianth tube but leaving a small mouth on top, smooth or many angled outside.

Between 200 and 250 species: tropical and subtropical regions, absent from C Africa, center of diversity in Malaysia but reaching as far as Australia and Chile; 21 species (15 endemic) in China.

The Chinese species of the genus all belong to *Cryptocarya* subg. *Cryptocarya*, characterized by plants with 9 fertile stamens. The species with 3 or 6 stamens previously placed in *Cryptocarya* are now included in the genus *Aspidostemon* Rohwer & H. G. Richter.

*Cryptocarya austrokwachouensis* X. H. Song (J. Nanjing Inst. Forest. 1984(4): 49. 1984) was described from S Guizhou (Libo) but could not be treated here because no material was seen by the present authors.

- 1a. Leaves triplinerved.
  - 2a. Fruit oblate, 12–18 × 15–25 mm, inconspicuously angled; leaf blade large, narrowly elliptic to elliptic-ovate, 10–15 × 5–8.5 cm; branchlets, petioles, and leaf blade abaxially usually ± rusty tomentose ..... 1. *C. densiflora*
  - 2b. Fruit globose or oblate, 7.5–9 × 9–12 mm, 12–15-angulate; leaf blade narrowly elliptic, 7–11 × (2–)3.5–5.5 cm; branchlets, petioles, and leaf blade abaxially usually glabrate ..... 2. *C. chinensis*
- 1b. Leaves pinninerved.
  - 3a. Leaf venation conspicuously elevated, densely reticulate on both surfaces.
    - 4a. Young branchlets pubescent; leaf blade oblong-elliptic or oblong-lanceolate, 4.5–10.2 × 2–4.5 cm, lateral veins 7–9 pairs ..... 3. *C. yaanica*
    - 4b. Young branchlets glabrous; leaf blade ovate or ovate-elliptic, rarely elliptic, 7–13 × 2.5–6 cm, lateral veins 3–6 pairs.
      - 5a. Leaf blade ovate-elliptic, 9–11 × 4.5–6 cm, lateral veins 5 or 6 pairs ..... 4. *C. elliptifolia*
      - 5b. Leaf blade ovate, rarely elliptic, 7–13 × 2.5–5.5 cm, lateral veins 3–5 pairs ..... 5. *C. lyoniifolia*
  - 3b. Leaf venation not densely reticulate on both surfaces.
    - 6a. Fruit corky-spotted ..... 6. *C. maculata*
    - 6b. Fruit not corky-spotted.
      - 7a. Fruit very smooth, not angled.
        - 8a. Fruit ovoid, 1.5–1.8 cm; panicle short, much shorter than leaf blade, few branched; leaf blade oblong or oblong-elliptic, 8–26 × 2.5–7.5 cm, purple-green and whitish abaxially ..... 7. *C. brachythyrsa*
        - 8b. Fruit ellipsoid or narrowly ellipsoid, 2–2.5 cm; panicle large and several branched; leaf blade elliptic or oblong, 7.5–18 × 5–6.5 cm, gray-brown and opaque abaxially ..... 8. *C. amygdalina*
      - 7b. Fruit not smooth, conspicuously or inconspicuously angled.
        - 9a. Fruit globose, subglobose, or oblate.
          - 10a. Fruit oblate, large, ca. 2.1 × 2.3 cm ..... 9. *C. depauperata*
          - 10b. Fruit smaller, less than 1.5 cm.
            - 11a. Leaf blade (6.5–)10.5–19 × (3.5–)4.2–8.5 cm, abaxially sparsely yellowish brown pubescent, densely so along midrib and lateral veins, yellow-green, not whitish ..... 10. *C. calcicola*
            - 11b. Leaf blade smaller, 5–12 × 2–4.5 cm, abaxially glabrous except hairy along midrib and lateral veins, always whitish.
              - 12a. Panicle 5–10 cm ..... 11. *C. maclurei*
              - 12b. Panicle short, 2–3 cm ..... 12. *C. kwangtungensis*
          - 9b. Fruit narrowly ellipsoid, ellipsoid, or ovoid.
            - 13a. Fruit more than 2.5 cm.
              - 14a. Fruit ovoid, rugose and warty, inconspicuously angled; leaf blade lanceolate to oblong-lanceolate, 9–13 × 2.5–4.5 cm; branchlets and leaves glabrate; panicle spikelike, 3–8 cm, few flowered ..... 13. *C. hainanensis*
              - 14b. Fruit ellipsoid, not rugose and warty, ± conspicuously angled; leaf blade

- narrowly elliptic, large, (9–)15–28 × (2.5–)5.5–14 cm; branchlets and leaves ± densely rusty pubescent; panicles towerlike, axillary ones (5–)7.5–15 cm, terminal ones up to 19 cm, many flowered ..... 14. *C. acutifolia*
- 13b. Fruit smaller, less than 2.5 cm.
- 15a. Leaf blade transverse veins conspicuously elevated abaxially ..... 20. *C. impressinervia*
- 15b. Leaf blade transverse veins not elevated abaxially.
- 16a. Panicles variable, sometimes few flowered, much shorter than leaf, 2–4 cm, sometimes many flowered, as long as 1/2 of blade or more, 5.5–12 cm ..... 21. *C. yunnanensis*
- 16b. Panicle not variable, ± uniform, less than 10 cm.
- 17a. Leaf blade thickly leathery, very shiny adaxially ..... 17. *C. tsangii*
- 17b. Leaf blade leathery, subleathery, or papery, opaque or slightly shiny adaxially.
- 18a. Panicles ca. 10 cm; leaf blade glabrous on both surfaces ..... 16. *C. metcalfiana*
- 18b. Panicles shorter, less than 8 cm; leaf blade sparsely pubescent abaxially or on both surfaces.
- 19a. Fruit narrowly ellipsoid, 1.5–2 cm; leaf blade usually smaller ..... 15. *C. concinna*
- 19b. Fruit ellipsoid, 1.2–1 cm; leaf blade usually larger.
- 20a. Fruit ca. 1.7 × 1 cm; leaf blade leathery, oblong or elliptic-orbicular, very rarely obovate ..... 18. *C. chingii*
- 20b. Fruit ca. 1.2 × 0.7 cm; leaf blade subleathery, lanceolate, lanceolate-elliptic, or elliptic, very rarely obovate ..... 19. *C. leiana*

**1. *Cryptocarya densiflora*** Blume, Bijdr. 556. 1826.

丛花厚壳桂 *cong hua hou ke gui*

*Cryptocarya laevigata* Elmer.

Trees, 7–20 m tall, 12–40 cm d.b.h. Branchlets brownish or dark brown, angled, striate, sparsely lenticellate, rusty tomentose. Leaves alternate; petiole 1–2 cm, plano-convex, rusty tomentose or glabrate; leaf blade glaucous and greenish abaxially, shiny and brownish when dry adaxially, narrowly elliptic to elliptic-ovate, 10–15 × 5–8.5 cm, leathery, rusty tomentose initially but soon glabrate abaxially, triplinerved, midrib impressed abaxially, elevated adaxially, basal lateral veins subopposite, arising (2–)5–15 mm above leaf base, arcuate-ascendant, with additional veins outside, other lateral veins 1 or 2 pairs, arising from middle or above lower 1/3 of leaf blade, transverse veins slender, subundulate, rather lax, connected by veinlets, base cuneate, obtuse, or rounded, apex abruptly shortly acuminate. Panicles axillary or terminal, 2.5–8 × 4–5 cm, pedunculate, densely many flowered, brown pubescent. Pedicels short, less than 1 mm, densely brown pubescent. Flowers white, ca. 4 mm. Perianth densely pubescent outside and inside; perianth tube turbinate, short, ca. 2 mm; perianth lobes ovate, ca. 2 mm, acute. Fertile stamens 9; filaments villous, ca. twice as long as anthers, those of 3rd whorl each with 2 clavate glands at base, others glandless; anthers 2-celled; cells of 1st and 2nd whorls introrse, those of 3rd whorl extrorse. Staminodes sagittate, long stalked. Ovary clavate, ca. 2 mm; style linear; stigma inconspicuous. Fruit brown-yellow initially but dark black when mature, glaucous, oblate, 1.2–1.8 × 1.5–2.5 cm, smooth, inconspicuously angled, conspicuously apiculate at apex. Fl. Apr–Jun, fr. Jul–Nov.

Valleys, evergreen broad-leaved forests; 600–1600 m. Fujian, Guangdong, Guangxi, Hainan, Yunnan [Indonesia, Laos, Malaysia,

Philippines, Vietnam].

The wood is finely grained, more or less heavy and durable, and is used for house construction and furniture.

**2. *Cryptocarya chinensis*** (Hance) Hemsley, J. Linn. Soc., Bot. 26: 370. 1891.

厚壳桂 *hou ke gui*

*Beilschmiedia chinensis* Hance, J. Bot. 20: 79. 1882.

Trees, up to 20 m tall, to 10 cm d.b.h. Bark dark gray, scabrid. Old branchlets robust, ± angled, brownish sparsely lenticellate; young branchlets terete, striate, grayish brown tomentose initially but soon glabrate. Leaves alternate or opposite; petiole ca. 1 cm, concave-convex; leaf blade glaucous abaxially, shiny adaxially, narrowly elliptic, 7–11 × (2–)3.5–5.5 cm, leathery, grayish brown tomentulose when young, gradually glabrate on both surfaces, triplinerved, midrib elevated abaxially, impressed adaxially, basal lateral veins opposite, arising 2–5 mm above leaf base, upper lateral veins 2 or 3 pairs and alternate, transverse veins slender, subundulate, veinlets reticulate, conspicuous on both surfaces, base broadly cuneate, apex long or shortly acuminate. Panicles axillary and terminal, 1.5–4 cm, yellow tomentulose, pedunculate. Pedicels very short, ca. 0.5 mm, yellow tomentulose. Flowers yellowish, ca. 3 mm. Perianth yellow tomentulose outside and inside; perianth tube turbinate, short, 1–1.5 mm; perianth lobes subobovate, ca. 2 mm, acute. Fertile stamens 9, ca. 1.5 mm in 1st and 2nd whorls, ca. 1.7 mm in 3rd whorl; filaments villous, slightly longer than anthers, those of 3rd whorl each with 2 clavate glands, others glandless; anthers 2-celled; cells of 1st and 2nd whorls introrse, those of 3rd whorl lateral-extrorse. Staminodes subulate-sagittate, villous. Ovary clavate, ca. 2 mm; style filiform; stigma inconspicuous. Fruit globose or oblate, 7.5–9 × 9–12 mm, purple-black when mature, 12–15-angulate. Fl. Apr–

May, fr. Aug–Dec.

• Evergreen broad-leaved forests in shady valleys; 300–1100 m. Fujian, Guangdong, Guangxi, Hainan, Sichuan, Taiwan.

The wood is finely grained, easily cut, and is used for furniture.

**3. *Cryptocarya yaanica*** N. Chao ex H. W. Li et al., *Acta Phytotax. Sin.* 17(2): 68. 1979.

雅安厚壳桂 ya an hou ke gui

*Cryptocarya reticulata* Yen C. Yang, J. W. China Border Res. Soc., Ser. B, 15: 70. 1945, not Blume (1851); *Beilschmiedia yaanica* (N. Chao ex H. W. Li et al.) N. Chao.

Trees, ca. 8 m tall. One-year-old branchlets brown-gray, glabrous, lenticellate; current year branchlets gray-green, striate, pubescent. Leaves alternate; petiole 5–10 mm, glabrous, sulcate adaxially; leaf blade gray-green abaxially, shiny and green adaxially, oblong-elliptic or oblong-lanceolate, 4.5–10.2 × 2–4.5 cm, leathery, glabrous on both surfaces, pinninerved, midrib elevated abaxially, slightly conspicuous adaxially, lateral veins 7–9 pairs, conspicuous on both surfaces, veins and veinlets densely reticulate, base cuneate, apex long acuminate, slightly falcate. Inflorescence paniculate or racemose, axillary, up to 4 × 1.5 cm, pubescent; peduncle 3–12 mm. Pedicels 1–4 mm, densely pubescent. Flowers greenish. Perianth lobes 6, broadly ovate or suborbicular, 2–2.5 × 1.5–2 mm, pubescent outside and inside. Fertile stamens 9; filaments hirsute, those of 3rd whorl each with 2 reniform glands at base, others glandless; anthers hirsute, 2-celled; cells of 1st and 2nd whorls introrse but those of 3rd whorl extrorse. Staminodes 3, sagittate, glabrous, subsessile. Ovary ovoid, glabrous, ca. 0.6 mm in diam.; style 1–1.2 mm; stigma subglobose. Fruit unknown.

• Roadsides. C Sichuan (Ya'an).

With regard to leaf venation, *Cryptocarya yaanica* is very similar to *Beilschmiedia*. Only flowering specimens were seen, so it will be necessary to see fruiting specimens in order to confirm the placement of this species.

**4. *Cryptocarya elliptifolia*** Merrill, *Philipp. J. Sci.* 14: 396. 1919.

菲岛厚壳桂 fei dao hou ke gui

Trees medium-sized. Branchlets brownish black when dry, glabrous. Buds hirsute. Petiole ca. 1 cm, stout, glabrous; leaf blade ovate-elliptic, 9–11 × 4.5–6 cm, leathery, lateral veins 5 or 6 pairs, reticulate veinlets prominent, base obtuse, apex shortly acuminate. Panicles axillary, 7–8 cm, hirsute. Flowers ca. 1.5 mm. Perianth lobes 6, elliptic-obovate, ca. 1.5 mm, densely hirsute on both surfaces, apex obtuse. Fertile stamens 9; filaments villous; anthers 2-celled. Ovary glabrous. Fruit black when dry, globose, ca. 2 cm in diam., longitudinally ridged. Fl. Apr–May, fr. Jun–Dec.

Coastal forests; below 100 m. Taiwan (Lan Yu) [Philippines].

**5. *Cryptocarya lyoniifolia*** S. K. Lee & F. N. Wei, *Guihaia* 8: 303. 1988.

南烛厚壳桂 nan zhu hou ke gui

Trees, up to 20 m tall. Branchlets striate, glabrous. Buds

brown villous. Petiole ca. 1 cm, glabrous; leaf blade ovate, rarely elliptic, 7–13 × 2.5–5.5 cm, glabrous on both surfaces, pinninerved, midrib elevated abaxially, plane adaxially, lateral veins lax, 3–5 pairs, elevated on both surfaces, veins and veinlets reticulate and foveolate on both surfaces especially abaxially, base cuneate or subrounded, apex long acuminate. Flowers unknown. Inflorescence terminal or axillary, 4–8 cm, pubescent. Fruit globose, 8–9 mm in diam., glabrous, rugose. Fr. Oct–Dec (or Jan of next year).

• Dense forests. SW Guangxi (Jingxi, Longzhou, Tiandeng).

**6. *Cryptocarya maculata*** H. W. Li, *Acta Phytotax. Sin.* 17(2): 68. 1979.

斑果厚壳桂 ban guo hou ke gui

Trees, ca. 10 m tall. Branchlets red-brown, terete, ca. 3 mm in diam., striate, lenticellate, glabrous. Petiole 0.5–1.3 cm, concave-convex, glabrous; leaf blade greenish and opaque abaxially, green and shiny adaxially, oblong, 9.5–18 × 3–5 cm, leathery, glabrous on both surfaces, midrib conspicuously elevated abaxially, impressed adaxially, lateral veins ca. 9 pairs, elevated abaxially, plane or slightly impressed adaxially, transverse veins and veinlets reticulate, inconspicuous on both surfaces, base broadly cuneate, apex obtuse or acute. Flowers unknown. Fruit ellipsoid-ovoid, 3–3.2 × 1.5–1.6 cm, black-brown when dry, corky-spotted, glabrous, somewhat wrinkled, inconspicuously 12-angulate. Fr. Aug.

• Dense forests; ca. 1000 m. S Guangxi (Shangsi), SE Yunnan (Pingbian).

**7. *Cryptocarya brachythyrsa*** H. W. Li, *Acta Phytotax. Sin.* 17(2): 68. 1979.

短序厚壳桂 duan xu hou ke gui

Trees, up to 30 m tall, to 40 cm d.b.h. Branchlets red-brown, robust, terete, ± angled, striate, densely lenticellate, glabrous; young ones slightly compressed, densely yellowish brown puberulent. Petiole 1–1.5 cm, concave-convex, densely yellowish brown puberulent; leaf blade whitish purple-green abaxially, yellow-green and shiny adaxially, oblong or oblong-elliptic, 8–26 × 2.5–7.5 cm, thinly leathery, puberulent along midrib only initially, soon glabrate on whole surface adaxially, midrib and lateral veins elevated abaxially, impressed adaxially, lateral veins 6–9 pairs, ascendant, evanescent within leaf margin, transverse veins ± conspicuous on both surfaces, veinlets reticulate. Panicle axillary, short, 2–2.5(–4) cm, densely yellowish brown puberulent, few flowered, few branched; lowest branches, 0.8–1.5 cm; peduncle 1–1.5 cm; bracts and bracteoles ovate-subulate, small. Pedicels 1–2 mm, densely yellowish brown puberulent. Flowers greenish, ca. 4 mm. Perianth yellowish brown puberulent outside; perianth tube turbinate, ca. 2 mm; perianth lobes obovate, ca. 2 mm, acute. Fertile stamens 9, ca. 1.5 mm in 1st and 2nd whorls, ca. 1.4 mm in 3rd whorl; filaments almost as long as anthers, those of 3rd whorl each with 2 stalked reniform glands, others glandless; anthers of 1st and 2nd whorl subcordate, with introrse cells, those of 3rd whorl ovoid, with extrorse cells. Staminodes narrowly sagittate-triangular, ca. 1 mm, stalked. Ovary clavate, ca. 2.5 mm; style slender, ca. 1 mm; stigma capitate. Fruit shiny, ovoid, 1.5–1.8 ×

1.1–1.3 cm, glabrous, inconspicuously angled. Fl. Apr–May, fr. Jun–Nov.

• Evergreen broad-leaved forests in valleys; 1000–1800 m. S Yunnan.

**8. *Cryptocarya amygdalina*** Nees in Wallich, Pl. Asiat. Rar. 2: 69. 1831.

杏仁厚壳桂 xing ren hou ke gui

Trees to 25 m tall. Branchlets patent; young ones terete, ca. 3 mm in diam., striate, densely and finely rusty tomentulose. Leaves alternate; petiole 0.6–1.2 cm, finely rusty tomentose; leaf blade gray-brown and opaque abaxially, green and shiny adaxially, elliptic or oblong, 7.5–18 × 5–6.5 cm, subleathery, glabrous on both surfaces except puberulent along midrib adaxially, midrib slender, lateral veins 6–10 pairs, straight but abruptly curved near leaf margin, veins and veinlets reticulate, fine and dense, base acute or obtuse, apex shortly acuminate. Inflorescences to 14 cm, tomentose. Pedicels ca. 1 mm. Flowers yellow, 3–5 mm, tomentose outside. Perianth lobes narrowly ovate, 1.5–2 mm, tomentose inside. Fertile stamens 9, 1.5–2 mm, inner whorl longest. Stamines triangular, ca. 1 mm. Ovary ca. 1 mm, glabrous or sparsely hairy at apex; style ca. 1 mm, glabrous. Infructescence paniculate, large and several branched. Fruit green, ellipsoid or narrowly ellipsoid, 2–2.5 cm, glabrous, very smooth, not angled. Fr. Aug.

Evergreen broad-leaved forests on hilly land; ca. 1100 m. SE Xizang (Médog) [Bhutan, India, Nepal].

**9. *Cryptocarya depauperata*** H. W. Li, Acta Phytotax. Sin. 17(2): 69. 1979.

贫花厚壳桂 pin hua hou ke gui

Trees, up to 20 m tall. Branchlets terete, ca. 2.5 mm in diam., sometimes ± angled, striate, densely yellowish brown puberulent, sparsely corky lenticellate on lower part. Leaves alternate; petiole 0.8–1.2 cm, concave-convex, yellowish brown puberulent; leaf blade greenish abaxially, green adaxially, oblong or ovate-oblong, 8–19.5 × 3.3–8 cm, thinly leathery, glabrous on both surfaces or sparsely puberulent only along midrib adaxially, midrib and lateral veins very elevated abaxially, slightly conspicuous adaxially, lateral veins (4 or) 5–7 pairs, arcuate-ascendant, evanescent within margin, veins and veinlets ± conspicuous on both surfaces, veinlets reticulate, base broadly cuneate and asymmetric on sides, apex acuminate or sometimes obtuse but with acute acumen. Panicle axillary and terminal, short, 3–5.5 cm, few flowered, lax, few branched; branches short, less than 4.5 mm; peduncle 0.8–1.5(–2.5) cm, peduncle and rachis densely yellowish brown puberulent; bracts and bracteoles minute, subulate, less than 1 mm, densely yellowish brown puberulent, caducous. Pedicels ca. 1 mm, densely yellowish brown puberulent. Flowers green-yellow, ca. 3.5 mm. Perianth densely yellowish brown puberulent outside but rather sparsely so inside; perianth tube turbinate, ca. 1.5 mm; perianth lobes ovate, ca. 2 mm, acute. Fertile stamens 9, ca. 1.7 mm; filaments villous, those of 3rd whorl each with 2 long-stalked suborbicular glands, others glandless; anthers ca. 1/2 as long as filaments, anthers of 1st and 2nd whorls oblong, with introrse cells, those of 3rd whorl ovoid-oblong, with extrorse cells.

Stamines narrowly sagittate-triangular, ca. 1.3 mm, stalked; stalk ca. 0.7 mm. Ovary clavate, including style ca. 3 mm; style linear; stigma inconspicuous. Fruit shiny, oblate, ca. 2.1 × 2.3 cm, black when mature, nearly smooth, inconspicuously angled. Fl. Apr–May, fr. Jun–Dec.

• Evergreen broad-leaved forests, along streams in valleys; 1300–1400 m. SE Yunnan.

**10. *Cryptocarya calcicola*** H. W. Li, Acta Phytotax. Sin. 17(2): 69. 1979.

岩生厚壳桂 yan sheng hou ke gui

Trees, up to 15 m tall, to 30 cm d.b.h. Young branchlets slender, terete, ca. 3 mm in diam., striate, sometimes ± angled, densely yellowish brown pubescent. Leaves alternate; petiole 0.5–1 cm, plano-convex, densely yellowish brown pubescent; leaf blade abaxially yellow-green, adaxially green, oblong or elliptic-oblong to ovate, (6.5–)10.5–19 × (3.5–)4.2–8.5 cm, thinly leathery, pinninerved, abaxially sparsely yellowish brown pubescent but densely so along midrib and lateral veins, adaxially yellowish brown pubescent along midrib and otherwise glabrous, midrib and lateral veins very elevated abaxially, impressed adaxially, transverse veins and veinlets reticulate, conspicuous abaxially, inconspicuous adaxially, base broadly cuneate to subrounded and ± unequal on sides, apex obtuse, acute, or shortly acuminate, sometimes incised. Panicles axillary and terminal, 5.5–14 cm, densely yellowish brown pubescent, axillary ones generally few branched and nearly spikelike, terminal or subterminal ones many branched and lax, lower branches up to 4 cm; peduncles 1.5–4.5 cm; bracts and bracteoles linear-subulate, ca. 2 mm, densely yellowish brown pubescent. Pedicels 1–2 mm, densely yellowish brown pubescent. Flowers greenish, ca. 5 mm. Perianth densely yellowish brown pubescent outside but sparsely so inside; perianth tube turbinate or suburceolate, ca. 2.5 mm; perianth lobes oblong-ovate, ca. 2.5 mm, acute. Fertile stamens 9, ca. 2.2 mm; filaments ca. 1.2 mm, villous, those of 3rd whorl each with 2 long-stalked suborbicular glands at base, others glandless; anthers ca. 1 mm, those of 1st and 2nd whorls ovoid-triangular, with introrse cells, those of 3rd whorl ovoid, with extrorse cells. Stamines sagittate-triangular, ca. 1 mm, shortly stalked. Ovary clavate, including filiform style ca. 3.5 mm; stigma inconspicuous. Fruit purple-black, shiny, subglobose, ca. 1.3 × 1–1.1 cm, glabrous or sparsely puberulent on both ends, ± wrinkled, inconspicuously 12-angulate. Fl. Apr–May, fr. May–Oct.

• Evergreen broad-leaved forests, hillsides, streamsides; (500–) 700–1000 m. Guangxi, S Guizhou, S and SE Yunnan.

**11. *Cryptocarya maclurei*** Merrill, Philipp. J. Sci. 21: 344. 1922.

白背厚壳桂 bai bei hou ke gui

Trees up to 22 m tall, ca. 15 cm d.b.h. Bark gray-black. Branchlets slender, subterete, ± angled, striate, densely rusty pubescent when young but glabrate and gray-black when mature. Leaves alternate; petiole 1.2–1.5 cm, concave-convex, densely rusty pubescent; leaf blade greenish or whitish and opaque abaxially, olive-green and shiny adaxially, oblong or ob-

long-ovate, 5–12 × 2–4.5 cm, abaxially rusty pubescent along midrib and lateral veins, adaxially rusty pubescent only along midrib, otherwise glabrous on both surfaces, midrib and lateral veins elevated abaxially, impressed adaxially, lateral veins 5–7 pairs, transverse veins slender, connected by reticulate veinlets, base broadly cuneate to subrounded, apex shortly acuminate. Flowers unknown. Fruit globose or oblate, ca. 1.5 cm in diam., black when mature, glabrous, ca. 15-angulate when young. Fr. Aug–Feb of next year.

• Evergreen broad-leaved forests on hilly land, forested valleys; 600–1000 m. Guangdong, Guangxi, Hainan.

**12. *Cryptocarya kwangtungensis*** Hung T. Chang, Acta Sci. Nat. Univ. Sunyatseni 1963(4): 132. 1963.

广东厚壳桂 *guang dong hou ke gui*

Trees, 2–6.5 m tall, 5–13 cm d.b.h. Branchlets brown pubescent when young but glabrous when mature. Leaves alternate; petiole 6–10 mm; leaf blade green and shiny adaxially, narrowly elliptic, 9–11.5 × 3–4 cm, leathery, yellowish brown pubescent when young but soon glabrate and whitish abaxially, lateral veins 6 or 7 pairs, slightly elevated abaxially, inconspicuous adaxially, veins and veinlets reticulate, inconspicuous on both surfaces, base broadly cuneate and asymmetric on sides, apex acute or slightly obtuse. Inflorescence paniculate or racemose, terminal and axillary, 2–3 cm, yellowish brown pubescent. Pedicels very short. Flowers small, ca. 2 mm, pubescent. Perianth lobes slightly longer than perianth tube. Stamens included. Ovary puberulent. Immature fruit globose, inconspicuously angled, villous initially but soon glabrate. Fr. Jul.

• Densely forested valleys. N Guangdong.

**13. *Cryptocarya hainanensis*** Merrill, Philipp. J. Sci. 21: 343. 1922.

海南厚壳桂 *hai nan hou ke gui*

*Cryptocarya rolletii* H. Wang & H. Zhu.

Trees, up to 20 m tall. Old branchlets chestnut-colored or blackish, finely striate, lenticellate and glabrous; young branchlets slender, finely striate, pubescent or glabrate on lower part. Leaves alternate; petiole robust, 5–8 mm, plano-convex, puberulent initially but soon glabrate; leaf blade greenish abaxially, olive-green adaxially when dry, lanceolate to oblong-lanceolate, 9–13 × 2.5–4.5 cm, thinly leathery, puberulent along midrib adaxially and glabrous abaxially when young but glabrous on both surfaces when mature, midrib and lateral veins conspicuously elevated abaxially, always slightly impressed adaxially, lateral veins 5 or 6 pairs, arcuate-ascendant, veins and veinlets slender, reticulate, dense and foveolate, base broadly cuneate, apex acuminate. Panicles spikelike, axillary and terminal, 3–8 mm, densely yellowish brown tomentulose, few flowered, branched; branches slender, up to 2.5 cm; peduncles 0.5–2 cm; bracts and bracteoles lanceolate-linear, ca. 1 mm, densely yellowish brown tomentulose. Pedicels less than 1 mm. Flowers ca. 2.5 mm. Perianth tomentulose outside and inside; perianth tube obconical; perianth lobes almost as long as tube, broadly ovate, acute. Fertile stamens 9, less than 1 mm; filaments vil-

lous, those of 3rd whorl each with 2 stalked triangular-ovate glands at base, others glandless; anthers 2-celled; cells of 1st and 2nd whorls introrse, those of 3rd whorl extrorse. Staminodes sagittate-deltoid, stalked. Ovary ovoid, ca. 0.7 mm; style slender, ca. 0.7 mm; stigma capitate. Fruit shiny, ovoid, 2.5–3 × 1.5–2 cm, wrinkled, papillate, black when mature, inconspicuously angled, slightly apiculate at apex, attenuate into a short stalk at base. Fl. Apr, fr. Aug–Jan of next year.

Evergreen broad-leaved forests, forested valleys; 500–700 m. S Guangxi, Hainan, S Yunnan [Vietnam].

**14. *Cryptocarya acutifolia*** H. W. Li, Acta Phytotax. Sin. 17(2): 69. 1979.

尖叶厚壳桂 *jian ye hou ke gui*

Trees, up to 25 m tall, to 30 cm d.b.h. Old branchlets robust, ± angled, striate, densely rusty pubescent or sometimes ± glabrate; young branchlets slender, ca. 4 mm in diam., densely rusty pubescent. Leaves alternate; petiole robust, 1–1.5 cm, plano-convex, very densely rusty pubescent; leaf blade abaxially glaucous green, adaxially yellowish green when dry, opaque or shiny, narrowly elliptic, (9–)15–28 × (2.5–)5.5–14 cm, leathery, abaxially pubescent, adaxially glabrous except rusty pubescent along midrib or sometimes also along lateral veins, midrib and lateral veins conspicuously elevated abaxially, always impressed adaxially, lateral veins (7–)9–11 pairs, transverse veins conspicuous abaxially, ± impressed adaxially, veinlets laxly reticulate, conspicuous abaxially, base broadly cuneate, obtuse to subrounded, apex rounded and abruptly apiculate or sometimes incised but always acute. Panicles axillary and terminal, those arising from upper leaf axils shorter, (5–)7.5–15 cm, terminal ones longer, up to 19 cm, all towerlike, branched, densely rusty pubescent; peduncles (2–)2.5–4.5 cm; bracts and bracteoles ovate, ca. 3 × 2 mm, densely rusty pubescent. Pedicels very short, less than 1 mm, rusty pubescent. Flowers yellowish, ca. 5 mm. Perianth pubescent outside and inside; perianth tube turbinate, ca. 2.5 mm; perianth lobes oblong-ovate, ca. 2.5 mm, acute. Fertile stamens 9, slightly shorter than perianth lobes; filaments villous, those of 3rd whorl each with 2 shortly stalked reniform glands, others glandless; anthers 2-celled; cells of 1st and 2nd whorls introrse, those of 3rd whorl extrorse. Staminodes narrowly sagittate-triangular, ca. 2 mm, shortly stalked. Ovary clavate, including style ca. 4 mm, attenuate at apex into a style; stigma inconspicuous. Mature fruit black-purple, ellipsoid, up to 3.4 × 2 cm, subglabrous or sparsely pubescent at apex, inconspicuously 12-angulate, obtuse at apex, abruptly contracted into a short stalk at base. Fl. Mar–May, fr. Jun–Dec.

• Evergreen broad-leaved forests on hilly land or in wet places along rivers, dry sparse secondary forests on mountain slopes; 500–700 m. S and SE Yunnan.

**15. *Cryptocarya concinna*** Hance, J. Bot. 20: 79. 1882.

黄果厚壳桂 *huang guo hou ke gui*

*Cryptocarya konishii* Hayata; *C. lenticellata* Lecomte; *C. microcarpa* F. N. Wei.

Trees, up to 18 m tall, to 35 cm d.b.h. Bark brownish.

Branchlets gray-brown, ± angled, finely striate and glabrous; young ones slender, angled, finely striate, densely yellowish brown tomentose. Leaves alternate; petiole yellow-brown, 0.4–1 cm, concave-convex, pubescent; leaf blade green-white abaxially, slightly shiny adaxially, elliptic-oblong or oblong, (3–)5–10 × (1.5–)2–3 cm, papery, slightly pubescent but soon glabrate abaxially, glabrous adaxially, midrib elevated abaxially, impressed adaxially, lateral veins 4–7 pairs, elevated abaxially, inconspicuous adaxially, transverse veins and veinlets irregularly reticulate, ± conspicuous abaxially, inconspicuous adaxially, base cuneate and unequal on sides, apex obtuse, subacute, or shortly acuminate. Panicles axillary and terminal, (2–)4–8 cm, pubescent, several branched toward top; peduncles pubescent; bracts very small, triangular. Pedicels 1–2 mm, pubescent. Flowers up to 3.5 mm. Perianth pubescent outside and inside; perianth tube subcampanulate, ca. 1 mm; perianth lobes oblong, ca. 2.5 mm, obtuse. Fertile stamens 9; filaments 1.4–1.5 mm, villous at base, those of 3rd whorl each with 2 stalked glands, others glandless; anthers oblong, ca. 1 mm; connective much exerted, exerted part ca. 0.33 mm; anther cells of 1st and 2nd whorls introrse, those of 3rd whorl extrorse. Staminodes 3, triangular-lanceolate, 1–1.5 mm. Ovary included in perianth tube, narrowly obovoid, gradually attenuate at apex into a style; stigma obliquely truncate. Fruit dark green when young, black or blue-black when mature, narrowly ellipsoid, 1.5–2 × ca. 0.8 cm, inconspicuously 12-angulate when young, inconspicuously angled when mature. Fl. Mar–May, fr. Jun–Dec.

Evergreen broad-leaved forests on gradual slopes or in valleys; below 600 m. Guangdong, Guangxi, SE Guizhou (Libo, Sandu), Hainan, Jiangxi, Taiwan [N Vietnam].

The wood is finely grained, heavy, durable, and is used for furniture or house construction.

**16. *Cryptocarya metcalfiana*** C. K. Allen, J. Arnold Arbor. 23: 457. 1942.

长序厚壳桂 chang xu hou ke gui

*Cryptocarya howii* C. K. Allen.

Trees, up to 30 m tall, to 30 cm d.b.h. Old branchlets brown, robust, angled, grayish brown lenticellate, glabrous; young branchlets angled, finely striate, sparsely pubescent. Leaves alternate; petiole 1–2 cm, plano-convex, glabrous; leaf blade slightly glaucous green abaxially, shiny adaxially, lanceolate, lanceolate-elliptic, or lanceolate-ovate to ovate, 5–12(–14) × 2.5–4(–5.5) cm, leathery, glabrous on both surfaces, midrib elevated abaxially, impressed adaxially, lateral veins 3–7 pairs, elevated abaxially, slightly impressed adaxially, veins and veinlets reticulate, conspicuous abaxially, inconspicuous adaxially, base cuneate and always asymmetric, apex acute, obtuse, or shortly acuminate. Panicles subracemose, axillary and terminal, many flowered, usually longer than leaf, ca. 10 cm, brown villous, terminal branches short, glaucous, 2- or 3-flowered. Pedicels slender, ca. 1 mm, pubescent. Flowers greenish yellow, ca. 3 mm. Fruit green when young and black when mature, narrowly ellipsoid, 1.4–2.5 × 1–1.1 cm, glabrous, inconspicuously angled; fruit stalk dilated, 2–3 mm. Fl. Mar–May, fr. Jun–Dec.

• Evergreen broad-leaved forests; below 900 m. Hainan.

The wood is finely grained, heavy, durable, and is used for

making furniture.

**17. *Cryptocarya tsangii*** Nakai, J. Jap. Bot. 16: 121. 1940.

红柄厚壳桂 hong bing hou ke gui

Trees, ca. 6 m tall, ca. 12 cm d.b.h. Branchlets many lenticellate; floral branchlets angled. Leaves alternate; petiole reddish, 5–13 mm; leaf blade opaque and light rusty when dry abaxially, very shiny adaxially, oblong, elliptic, or ovate, 5.5–12 × 1.5–4.6 cm, thickly leathery, sparsely pubescent abaxially, midrib elevated abaxially, impressed adaxially, always papillate near base, lateral veins 5–7 pairs, slightly elevated abaxially, obscurely visible adaxially, veins and veinlets finely reticulate, inconspicuous adaxially, base obtuse, apex acute or caudate. Flowers unknown. Inflorescence axillary or terminal. Fruit black, ellipsoid, 13–15 mm, papillate, inconspicuously 12-angulate. Fr. Aug–Dec.

• Hainan.

Allen (J. Arnold Arbor. 23: 459. 1942) suggested that *Cryptocarya tsangii* may be a form of *C. metcalfiana*. It is treated here temporarily as a distinct species because the present authors have not seen flowering specimens. More material is needed to make a definitive decision.

**18. *Cryptocarya chingii*** W. C. Cheng, Contr. Biol. Lab. Sci. Soc. China, Bot. Ser. 10: 111. 1936.

硬壳桂 ying ke gui

*Cryptocarya laui* Merrill & F. P. Metcalf; *C. merrilliana* C. K. Allen.

Small trees, up to 12 m tall, to 20 cm d.b.h. Old branchlets gray-brown, glabrous, sparsely oblong-lenticellate, striate; young branchlets densely gray-yellow pubescent. Leaves alternate; petiole 5–10 mm, concave-convex, densely gray-yellow pubescent when young; leaf blade glaucous green and opaque abaxially, olive-green and opaque or shiny adaxially, oblong, elliptic-oblong, very rarely obovate, 6–13 × 2.5–5 cm, leathery, gray-yellow appressed sericeous-pubescent on both surfaces, hairs slightly longer along midrib and lateral veins abaxially, midrib very elevated abaxially, impressed adaxially, lateral veins 5 or 6 pairs, conspicuous abaxially, slightly impressed adaxially, slightly arcuate and evanescent within leaf margin, transverse veins and veinlets reticulate, ± conspicuous abaxially, inconspicuous adaxially, base cuneate, apex abruptly acuminate, sometimes obtuse or emarginate. Panicles axillary and terminal, (3–)3.5–6 cm, ± lax, densely gray-yellow sericeous-pubescent on all parts; peduncles 2–3 mm. Perianth densely sericeous-pubescent outside but sparsely so inside; perianth tube turbinate, ca. 1.5 mm; perianth lobes ovate, ca. 1.5 mm, acute. Fertile stamens 9, less than 1.5 mm; filaments as long as anthers, those of 3rd whorl each with 2 stalked glands at base, others glandless; anthers 2-celled; cells of 1st and 2nd whorls introrse, those of 3rd whorl extrorse. Staminodes narrowly sagittate-triangular, stalked. Ovary clavate, including filiform style ca. 1.5 mm; stigma inconspicuous. Fruit greenish when young and dirty red when mature, ellipsoid, ca. 17 × 10 mm, glabrous, 12-angulate. Fl. Jun–Oct, fr. Sep–Mar of next year.

Evergreen broad-leaved forests; 300–800 m (but higher in Hainan). Fujian, Guangdong, Guangxi, Hainan, Jiangxi, Zhejiang [N Viet-

nam].

The wood is heavy and durable and is used for making furniture. A viscous liquid extracted from wood pieces in water is used to paste hairs together. The leafy branchlets contain essential oil.

**19. *Cryptocarya leiana*** C. K. Allen, J. Arnold Arbor. 23: 456. 1942.

鸡卵槁 ji luan gao

Trees, ca. 5 m tall. Young branchlets green-brown, slender, terete, dark yellow pubescent near top. Leaves alternate; petiole brown, 5–10 mm, glabrous, glandular; leaf blade glaucous green abaxially, green adaxially, lanceolate, lanceolate-elliptic, or narrowly elliptic, very rarely obovate, (4–)9–14 × 1.5–4(–5) cm, subleathery, pubescent but soon glabrate on both surfaces, lateral veins ca. 5 pairs, inconspicuous adaxially, veins and veinlets slender, densely reticulate, conspicuous abaxially, base cuneate, apex obtuse or acuminate to obtusely acuminate. Panicles axillary or subterminal, generally shorter than leaf, up to 6.5 cm, finely pubescent, branches slender, ± upright, terminal branchlets 3-flowered. Flowers yellowish, scented, 2–3 mm, dark yellow pubescent, shortly pedicellate or sessile. Perianth lobes ovate, ca. 2 mm, sparsely pubescent inside. Fruit ellipsoid, ca. 12 × 7 mm, purplish brown and glaucous when dry, glabrous, conspicuously angled, slightly contracted on both ends, apiculate at apex; fruit stalk slightly dilated. Fl. Sep. fr. after Sep.

- Thickets on sandy soil near villages. Hainan.

**20. *Cryptocarya impressinervia*** H. W. Li, Acta Phytotax. Sin. 17(2): 70. 1979.

钝叶厚壳桂 dun ye hou ke gui

*Cryptocarya obtusifolia* Merrill, Philipp. J. Sci. 21: 344. 1922, not F. Mueller ex Meisner (1864).

Trees, up to 18 m tall, to 30 cm d.b.h. Bark brown or gray-brown. Old branchlets slender, striate, lenticellate, densely rusty- or blackish brown pubescent; young branchlets ± angled, ca. 3 mm in diam., densely rusty pubescent. Leaves alternate; petiole robust, 1–1.5 cm, plano-convex, densely rusty pubescent; leaf blade greenish abaxially and yellow-green adaxially when dry, narrowly elliptic, 10–19 × 4.8–8 cm, thickly leathery, glabrous except rusty pubescent on midrib and lateral veins adaxially, pubescent throughout abaxially, lateral veins 7–9 pairs, lateral veins and midrib conspicuously elevated abaxially, slightly impressed adaxially, transverse veins conspicuous abaxially, ± impressed adaxially, veinlets laxly reticulate, conspicuous abaxially, base broadly cuneate, obtuse to subrounded, apex obtuse, mucronate, or incised, rarely acute. Panicles terminal and axillary, up to 14 cm, densely rusty pubescent, many branched, lower branches 5–6 cm; peduncles up to 6 cm; bracts and bracteoles broadly ovate, up to 3 mm, rusty pubescent on both surfaces. Pedicels less than 1 mm, densely rusty pubescent. Flowers yellowish green, ca. 3 mm. Perianth densely rusty pubescent outside but sparsely so inside; perianth tube turbinate, ca. 1.5 mm; perianth lobes ovate, ca. 1.5 mm, acute. Fertile stamens 9, ca. 1.5 mm; filaments villous, those of 3rd whorl each with 2 stalked suborbicular glands

at base, others glandless; anthers 2-celled; cells of 1st and 2nd whorls introrse, those of 3rd whorl extrorse. Staminodes narrowly sagittate-triangular, shortly stalked. Ovary clavate, including filiform style ca. 2.5 mm; stigma inconspicuous. Fruit ellipsoid, 10–12 × 6–8 mm, black when dry, 12-angulate. Fl. Jun–Jul, fr. Aug–Jan of next year.

- Evergreen broad-leaved forests in valleys, streamsides, riverbanks; 200–1100 m. Hainan.

The wood is finely grained, heavy, and durable.

**21. *Cryptocarya yunnanensis*** H. W. Li, Acta Phytotax. Sin. 17(2): 70. 1979.

云南厚壳桂 yun nan hou ke gui

Trees, up to 28 m tall, to 70 cm d.b.h. Bark gray. Old branchlets subterete, finely striate, yellow-brown when dry, glabrous; young branchlets slender, terete, ca. 3 mm in diam., striate, finely yellowish brown pubescent near top but glabrate on lower part. Leaves alternate; petiole 1.5–2.5 cm, concave-convex, glabrous; leaf blade brownish green abaxially and brown-green adaxially when dry, usually oblong, occasionally ovate or ovate-oblong, 7–19 × 3.2–10 cm, thinly leathery, glabrous and opaque on both surfaces, lateral veins 5–7 pairs, lateral veins and midrib ± conspicuous abaxially, plane adaxially, transverse veins and veinlets reticulate, ± conspicuous on both surfaces, base broadly cuneate to rounded, apex shortly acuminate. Panicles axillary and terminal, sometimes few flowered, much shorter than leaf blade, 2–4 cm, sometimes many flowered, nearly 1/2 as long as leaf blade or more, 5.5–12 cm, in latter case always much branched, branches slender and up to 4 cm; peduncle 1–5.5 cm, peduncle and rachis finely pubescent, always reddish. Pedicels 1–2 mm, densely finely pubescent. Flowers greenish white, ca. 3 mm. Perianth pubescent outside

and inside; perianth tube turbinate, ca. 1.5 mm; perianth lobes oblong-ovate, ca. 1.5 mm. Fertile stamens 9, ca. 1.5 mm; filaments villous, those of 3rd whorl each with 2 long-stalked orbicular-reniform glands at base, others glandless; anthers 2-celled, those of 1st and 2nd whorls oblong, slightly shorter than filaments, with introrse cells, those of 3rd whorl ovate-oblong and with lateral-extrorse cells. Staminodes narrowly sagittate-triangular, shortly stalked. Ovary clavate, including style nearly 3 mm; stigma capitate, inconspicuous. Fruit green when young but black-purple when mature, ovoid, ca. 16 × 12 mm when mature, glabrous, inconspicuously 12-angulate, attenuate at base, apex subrounded. Fl. Mar–Apr, fr. May–Jun.

- Evergreen broad-leaved forests in valleys, sparse secondary forests, mountain slopes, riverbanks; 500–1100 m. S Yunnan.



