

16. CLAUSENA N. L. Burman, Fl. Indica, 87, 243. 1768.

黄皮属 *huang pi shu*

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Shrubs or trees, unarmed, without rust-colored villosulous indumentum on terminal and axillary buds or young inflorescences. Leaves alternate, odd-pinnate. Inflorescences terminal or axillary, paniculate or in loose racemes. Flowers bisexual or very rarely female, globose to pyriform or rarely ovoid in bud. Sepals 4 or 5, connate at base or to their full length. Petals 4 or 5, imbricate in bud. Stamens 8 or 10, distinct, alternately unequal in length; filaments ± abruptly dilated toward base, ± straight or geniculate. Disk columnar, conic, bell-shaped, or ± hourglass-shaped. Gynoecium (2–)4- or 5-loculed, syncarpous; radial walls of locules straight; ovules 2 per locule; style 0.5–2.5 × as long as ovary, deciduous in fruit. Fruit a berry, with neither pulp nor pulp vesicles; endocarp membranous. Seeds with membranous seed coat; endosperm lacking; embryo straight; cotyledons elliptic, plano-convex, neither convolute nor folded; hypocotyl partly included between cotyledons.

Between ca. 15 and 30 species: Africa, E, S, and SE Asia, NE Australia, SW Pacific islands; ten species (five endemic) in China.

This genus is especially diverse in Guangdong, Guangxi, and Yunnan.

- 1a. Calyx lobes 4; petals 4(or 5); stamens 8.
 - 2a. Leaves 15–37-foliolate; fruit vermilion or pale yellow.
 - 3a. Fruit vermilion; leaflet blades 2–9 × 1–3 cm 1. *C. excavata*
 - 3b. Fruit pale yellow; leaflet blades not more than 2 × 1 cm 2. *C. hainanensis*
 - 2b. Leaves not more than 15-foliolate; fruit bluish black.
 - 4a. Leaves 5–15-foliolate; leaflet blades asymmetric 3. *C. dunniana*
 - 4b. Leaves 5–7-foliolate; leaflet blades symmetric 4. *C. vestita*
- 1b. Calyx lobes 5; petals (4 or)5; stamens 10.
 - 5a. Leaves 19–25-foliolate; stigma capitate or shield-shaped 5. *C. odorata*
 - 5b. Leaves not more than 15-foliolate; stigma punctiform to capitellate.
 - 6a. Fruit bluish black 10. *C. lenis*
 - 6b. Fruit pale yellow to reddish.
 - 7a. Ovary and fruit pubescent; flower buds 5-ridged 6. *C. lansium*
 - 7b. Ovary pubescent or glabrous but fruit glabrous; flower buds not ridged.
 - 8a. Fruit longer than wide; leaflets more than 5 cm wide at middle of rachis 7. *C. yunnanensis*
 - 8b. Fruit ± as wide as long; leaflets rarely to 5 cm wide at middle of rachis.
 - 9a. Leaflet blades 2–6 × 1–3 cm, subsessile 8. *C. emarginata*
 - 9b. Leaflet blades 5–12 × 2–4 cm, subtended by a 2–4 mm petiolule 9. *C. anisum-olens*

1. *Clausena excavata* N. L. Burman, Fl. Indica, 89. 1768.

假黄皮 *jia huang pi*

Amyris punctata Roxburgh; *Clausena excavata* var. *lunulata* (Hayata) Tanaka; *C. forbesii* Engler; *C. lumulata* Hayata; *C. moningeriae* Merrill; *C. punctata* (Roxburgh) Wight & Arnott; *C. tetramera* Hayata; *Lawsonia falcata* Loureiro.

Shrubs 1–2 m tall. Branchlets and leaf rachises pubescent, with oil glands. Leaves 21–27-foliolate but on young plants to 41-foliolate; petiolules 2–5 mm; leaflet blades ovate, lanceolate, or rhomboid, asymmetric, 2–9 × 1–3 cm, both surfaces pubescent or only pubescent along veins, base oblique, margin repand. Inflorescences terminal; bracts opposite. Flowers globose in bud. Petals white or pale yellowish white, ovate to obovate, 2–3 × 1–2 mm. Stamens 8; filaments basally dilated, geniculate at middle, apically linear. Style stout. Fruit ellipsoid, 1.2–1.8 × 0.8–1.5 cm, 1- or 2-seeded. Fl. Apr–May and Jul–Aug(–Oct in Hainan), fr. Aug–Oct. $2n = 36$.

Below 1000 m. S Fujian, Guangdong, Guangxi, Hainan, Taiwan, S Yunnan [Bangladesh, Bhutan, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Philippines, Thailand, Vietnam].

2. *Clausena hainanensis* C. C. Huang & F. W. Xing, Guihaia 12: 215. 1992.

海南黄皮 *hai nan huang pi*

Shrubs or trees, to 5 m tall. Leaves 25–37-foliolate; petiolules ca. 1 mm; leaflet blades alternate or opposite, asymmetrically elliptic, ca. 2 × 1 cm, midvein slightly depressed, base oblique and obtuse, margin repand, apex obtuse. Flowers not known. Infructescences terminal, narrowly paniculate, ca. 5 cm. Fruit pale yellow, ellipsoid, ca. 8 × 5 mm, pubescent. Fr. Jul–Aug.

• Limestone mountains; 900–1000 m. Hainan (Changjiang).

3. *Clausena dunniana* H. Léveillé, Repert. Spec. Nov. Regni Veg. 11: 67. 1912.

齿叶黄皮 *chi ye huang pi*

Trees 2–5 m tall, deciduous. Leaves 5–15-foliolate; petiolules 4–8 mm; leaflet blades ovate to lanceolate, 4–10 × 2–5 cm, glabrous or villous, base asymmetric, margin serrate or rarely repand, apex acute to acuminate. Inflorescences terminal. Flowers 4(or 5)-merous, globose in bud. Stamens 8(or 10); filaments geniculate at middle, subulate at apex. Disk small. Ovary globose; style shorter than ovary. Fruit bluish black

when ripe, globose, 1–1.5 cm in diam., 1- or 2-seeded. Fl. Jun–Jul, fr. Oct–Nov.

Montane forests, moist areas in mountains; 300–1500 m. Guangdong, Guangxi, Guizhou, W Hubei, Hunan, E and SE Sichuan, S Yunnan [NE Vietnam].

Molino (Bull. Mus. Natl. Hist. Nat., B, Adansonia 16: 130. 1994) placed *Clausena dunniana* in synonymy of *C. anisata* (Willdenow) J. D. Hooker ex Benth.

- 1a. Leaflet blades glabrous 3a. var. *dunniana*
1b. Leaflet blades villous 3b. var. *robusta*

3a. Clausena dunniana var. dunniana

齿叶黄皮(原变种) chi ye huang pi (yuan bian zhong)

Clausena dentata (Willdenow) M. Roemer var. *dunniana* (H. Léveillé) Swingle.

Leaflet blades glabrous.

Montane forests; 300–1500 m. Guangdong, Guangxi, Guizhou, Hunan, SE Sichuan, S Yunnan [NE Vietnam].

Molino (Bull. Mus. Natl. Hist. Nat., B, Adansonia 16: 130. 1994) placed *Clausena dentata* var. *dunniana* in synonymy of *C. anisata*.

3b. Clausena dunniana var. robusta (Tanaka) C. C. Huang, Acta Phytotax. Sin. 16(2): 85. 1978.

毛齿叶黄皮 mao chi ye huang pi

Clausena dentata var. *robusta* Tanaka, J. Bot. (Morot) 66: 228. 1930; *C. dentata* var. *henryi* Swingle; *C. henryi* (Swingle) C. C. Huang.

Leaflet blades villous. Leaflet blades and fruit slightly larger than those of autonym variety.

• Moist areas in mountains; 300–1300 m. W Hubei, Hunan, Guangxi, Guizhou, E Sichuan, S Yunnan.

Molino (Bull. Mus. Natl. Hist. Nat., B, Adansonia 16: 130. 1994) placed *Clausena dunniana* var. *robusta*, *C. dentata* var. *robusta*, *C. dentata* var. *henryi*, and *C. henryi* in synonymy of *C. anisata*.

4. Clausena vestita D. D. Tao, Acta Bot. Yunnan. 6: 73. 1984.

毛叶黄皮 mao ye huang pi

Trees to 4 m tall. Leaves 5–7-foliolate; petiolules 2–4 mm; leaflet blades alternate, broadly ovate, elliptic, or orbicular, 3–11 × 1.5–8 cm, apex rounded, obtuse, or acute. Calyx 4-parted, persistent in fruit. Fruit bluish black, globose to broadly ellipsoid, 1.2–1.6 cm in diam., glabrous, 1–3-seeded. Seeds ovoid to broadly ellipsoid, 8–12 × 6–9 mm. Fr. May.

• Thickets in dry hot river valleys; ca. 1900 m. NW Yunnan (Lijiang).

Molino (Bull. Mus. Natl. Hist. Nat., B, Adansonia 16: 130. 1994) placed *Clausena vestita* in synonymy of *C. anisata* (Willdenow) J. D. Hooker ex Benth.

5. Clausena odorata C. C. Huang, Acta Phytotax. Sin. 8: 92. 1959.

香花黄皮 xiang hua huang pi

Trees to 2 m tall. Shoots dark purplish red. Leaves 19–25-foliolate; petiolules 1–2 mm; leaflet blades oblong to lanceolate, asymmetric, 4–7 × 2–3.5 cm, base oblique, margin crenulate to subentire, apex acuminate and often retuse. Inflorescences terminal, paniculate. Flowers 5-merous, fragrant. Petals white, 3–4 mm. Stamens 10. Stigma capitate to shield-shaped. Fl. Apr.

• Thickets; ca. 1800 m. Yunnan (Mojiang).

Molino (Bull. Mus. Natl. Hist. Nat., B, Adansonia 16: 130. 1994) placed *Clausena odorata* in synonymy of *C. anisata* (Willdenow) J. D. Hooker ex Benth.

6. Clausena lansium (Loureiro) Skeels, Bull. Bur. Pl. Industr. U.S.D.A. 168: 31. 1909.

黄皮 huang pi

Quinaria lansium Loureiro, Fl. Cochinch. 1: 272. 1790; *Clausena wampi* (Blanco) Oliver; *Cookia wampi* Blanco.

Trees to 12 m tall. Leaves 5–11-foliolate; petiolules 4–8 mm; leaflet blades ovate to ovate-elliptic, 6–14 × 3–6 cm, midvein often pubescent, base rounded to broadly cuneate, margin repand to crenulate. Inflorescences terminal, paniculate. Flowers globose in bud. Calyx lobes broadly ovate, ca. 1 mm. Petals oblong, ca. 5 mm. Stamens 10; filaments linear, basal portion slightly expanded. Disk short. Ovary hirsute. Fruit pale yellow, globose, ellipsoid, or broadly ovoid, 1.5–3 × 1–2 cm, 1–4-seeded. Fl. Apr–May, fr. Jul–Aug (fl. and fr. ca. 1 month earlier in Hainan). $2n = 18$.

Fujian, Guangdong, Guangxi, S Guizhou, Hainan, Sichuan, SE Yunnan [Vietnam].

This species is cultivated for its fruit in China and elsewhere in warm areas of the world.

7. Clausena yunnanensis C. C. Huang, Acta Phytotax. Sin. 8: 91. 1959.

云南黄皮 yun nan huang pi

Trees 3–8 m tall. Bark gray. Branchlets stout; pith large. Leaves 5–11-foliolate; petiolules 4–6 mm; leaflet blades oblong to ovate-elliptic, 10–40 × 5–16 cm, papery, margin denticulate. Inflorescences terminal, paniculate, to 40 cm; bracts narrowly ovate, apex acute. Flowers globose in bud. Pedicel 1.5–3 mm. Sepals ovate, ca. 1 mm. Petals 2–3 mm. Stamens 10. Fruit orange, ellipsoid, ca. 3 × 2 cm, 1- or 2-seeded. Fl. Jun, fr. Sep–Oct.

• Mountain forests, forests on limestone; 500–1300 m. SW and W Guangxi, SE Yunnan.

Molino (Bull. Mus. Natl. Hist. Nat., B, Adansonia 16: 137. 1994) placed *Clausena yunnanensis* in synonymy of *C. engleri* Tanaka.

- 1a. Branchlets glabrate; leaflet blades abaxially shortly pubescent on venation 7a. var. *yunnanensis*
1b. Branchlets densely pubescent; leaflet blades abaxially with dense tufts of long weak trichomes, especially on midvein 7b. var. *longgangensis*

7a. *Clausena yunnanensis* var. *yunnanensis*

云南黄皮(原变种) yun nan huang pi (yuan bian zhong)

Branchlets glabrate. Leaf rachises minutely pubescent; petiolules glabrous or minutely pubescent; leaflet blades abaxially shortly pubescent on venation, adaxially glabrous or glabrate.

- Mountain forests. W Guangxi, SE Yunnan.

7b. *Clausena yunnanensis* var. *longgangensis* C. F. Liang & Y. X. Lu, Guihaia 10: 104. 1990.

弄岗黄皮 nong gang huang pi

Clausena yunnanensis var. *dolichocarpa* C. F. Liang & Y. X. Lu ex C. C. Huang.

Branchlets, leaf rachises, and petiolules densely pubescent. Leaflet blades abaxially with dense tufts of long weak trichomes, especially on midvein.

- Forests on limestone. SW Guangxi (Ningming).

Molino (Bull. Mus. Natl. Hist. Nat., B, Adansonia 16: 138. 1994) placed *Clausena yunnanensis* var. *longgangensis* in synonymy of *C. engleri*. *Clausena yunnanensis* var. *dolichocarpa* was not mentioned.

8. *Clausena emarginata* C. C. Huang, Acta Phytotax. Sin. 8: 93. 1959.

小黄皮 xiao huang pi

Trees 4–15 m tall. Branchlets grayish black. Leaves 5–11-foliolate; leaflet blades subsessile, obliquely lanceolate to ovate, 2–6 × 1–3 cm, dark brownish black when dry, base oblique, margin crenate, apex obtuse. Inflorescences terminal or axillary, 3–7 cm; bracts subulate. Calyx lobes broadly ovate. Petals ca. 4 mm at anthesis. Stamens 10; filaments slightly expanded in ± their basal half, geniculate, longer than anthers. Disk elongated. Ovary globose, glabrous. Fruit pale yellow,

globose, 8–10 mm in diam., 1- or 2-seeded. Fl. Mar–Apr, fr. Jun–Jul.

- Valley forests; 300–800 m. W Guangxi, SE Yunnan.

Molino (Bull. Mus. Natl. Hist. Nat., B, Adansonia 16: 134. 1994) placed *Clausena emarginata* in synonymy of *C. sanki* (Perrottet) J. F. Molino, which he later (Taxon 44: 427. 1995) decided should be called *C. anisum-olens*.

9. *Clausena anisum-olens* (Blanco) Merrill, Publ. Bur. Sci. Gov. Lab. 17: 21. 1904.

细叶黄皮 xi ye huang pi

Cookia anisum-olens Blanco, Fl. Filip. 359. 1837; *Clausena grandifolia* Merrill; *C. laxifolia* Quisumbing & Merrill; *C. loheri* Merrill; *C. todayensis* Elmer; *C. warburgii* Perkins.

Trees 3–6 m tall. Leaves 5–11-foliolate; petiolules 2–4 mm; leaflet blades falcately lanceolate to obliquely ovate, 5–12 × 2–4 cm, margin repand, apex acuminate to slightly obtuse. Inflorescences terminal. Flowers globose in bud, fragrant. Calyx lobes ovate, ca. 1 mm. Petals white, oblong, ca. 3 mm. Stamens 8 or 10; filaments slightly expanded in ± their basal half, geniculate. Style slightly shorter than ovary. Fruit pale yellow, globose, 1–2 cm in diam., 1- or 2-seeded. Fl. Apr–May, fr. Jul–Aug.

Taiwan (Lan Yu); cultivated in Guangdong, Guangxi, Yunnan [Philippines].

10. *Clausena lenis* Drake, J. Bot. (Morot) 6: 276. 1892.

光滑黄皮 guang hua huang pi

Clausena kerrii Craib.

Trees 2–3 m tall. Branchlet pith fairly large. Leaves 9–15-foliolate; leaflet blades ovate to lanceolate, asymmetric, 2–5 × 1.5–3.5 cm at base of rachis, ca. 18 × 11 cm at middle and apex of rachis, margin crenate. Inflorescences terminal. Flowers ovoid in bud. Calyx lobes 5. Petals (4 or)5, white but basally reddish to dark yellow. Stamens (8 or)10; filaments short; anthers oblong. Fruit globose, ca. 1 cm in diam., 1–3-seeded. Fl. Apr–Jun, fr. Sep–Oct.

Mountain forests; 500–1300 m. Guangdong, SW Guangxi, Hainan, S Yunnan [Laos, Thailand, NE Vietnam].

Fl. China 11: 83–85. 2008.