

6. CALOPHYLLUM Linnaeus, Sp. Pl. 1: 513. 1753.

红厚壳属 hong hou ke shu

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Apoterium Blume; *Augia* Loureiro.

Trees or shrubs, with clear [or milky or yellow] latex. Apical buds rarely abortive; buds lacking (or with) scales. Leaves opposite, petiolate [or rarely sessile], leathery, usually glabrous; secondary veins many, almost perpendicular to midvein, ± prominent above; tertiary venation absent; translucent glandular canals present between veins. Inflorescence cymose or thyrsiform, terminal or axillary. Flowers bisexual [or rarely unisexual]. Sepals and petals together 4–12 (usually 4 + 4 in Chinese species), 2- or 3-whorled, not always differentiated, outer (sepals) decussate, inner (petals) imbricate. Stamens many, not obviously fascicled; filaments scarcely united or all free, slender; anthers erect, basifix; fasciculodes absent. Ovary 1-loculed, glabrous [tomentose], with a single erect ovule; style elongate, slender; stigma often peltate. Drupelike berry with thin exocarp ("skin"), thin fleshy mesocarp and thin endocarp sometimes adherent to seed. Seed 1, large, with thin [or thick] testa ("stone"); embryo with broad fleshy cotyledons.

About 187 species: tropical regions, mainly in Asia, but also in E Africa, tropical America, Madagascar, the Mascarenes, and Australasia; four species in China.

- 1a. Inflorescences axillary only or also terminal on short axillary shoots; pedicels glabrous.
2a. Leaf blade elliptic to obovate, apex rounded to emarginate, thickly leathery; petiole 10–25 mm; pedicels
 15–40 mm; fruit globose, apex rounded 1. *C. inophyllum*
2b. Leaf blade oblong to oblong-lanceolate, apex acute to caudate-acuminate, ± thinly leathery; petiole
 6–10[–14] mm; pedicels 5–8 mm; fruit ovoid-cylindric, apex apiculate 2. *C. membranaceum*
1b. Inflorescences terminal only or also axillary; pedicels puberulous or villous.
3a. Young shoots densely gray-puberulous, drying brown to blackish; leaf blade ovate to elliptic; fruit ovoid,
 2.4–3.4 cm 3. *C. polyanthum*
3b. Young shoots almost glabrous, drying brown to yellowish; leaf blade elliptic or oblong-elliptic to obovate;
 fruit ovoid to subglobose, 1.1–1.8 cm 4. *C. blancoi*

1. *Calophyllum inophyllum* Linnaeus, Sp. Pl. 1: 513. 1753.

红厚壳 hong hou ke

Balsamaria inophyllum (Linnaeus) Loureiro.

Trees 5–12 m tall. Bark gray brown or dark brown, thick, with longitudinal fissures, always exuding pellucid resins when wounded. Young shoots striate. Petiole robust, 1–2.5 cm; leaf blade shiny on both surfaces, broadly elliptic or obovate-elliptic, rarely oblong, 8–15 × 4–8 cm, thickly leathery, midvein raised abaxially, impressed adaxially, base rounded or broadly cuneate, apex rounded or emarginate. Thyrses in upper axils, 7–11-flowered, rarely shorter than 10 cm. Pedicel 1.5–4 cm. Flowers scented, white, 2–2.5 cm in diam. Sepals 4; outer 2: suborbicular, ca. 8 mm; inner 2: obovate, petaloid. Petals 4, oblanceolate to obovate, ca. 1.1 cm, concave, apex subtruncate or rounded. Ovary subglobose; stigma peltate. Mature fruit yellow, globose, ca. 2.5 cm in diam. Fl. Mar–Jun, fr. Sep–Nov. $2n = 32$.

Wild or cultivated on open waste sites on hills, seashores, sandy wastelands; 100(–200) m. Hainan, Taiwan [Cambodia, India, Indonesia, Japan (Ryukyu Islands), Malaysia, Philippines, Sri Lanka, Thailand, Vietnam; Africa (including Madagascar), Australia, Indian Ocean islands (Mascarenes), Pacific islands (Polynesia)].

The seeds yield 20%–30% oil, the seed kernels 50%–60%. The seed oil is used for industry or as a medicine; it is also edible after refinement and detoxification. The timber is hard and heavy, and is used for making furniture. The bark contains ca. 15% tannin.

2. *Calophyllum membranaceum* Gardner & Champion,

Hooker's J. Bot. Kew Gard. Misc. 1: 309. 1849.

薄叶红厚壳 bao ye hong hou ke

Calophyllum spectabile Hooker & Arnott (1833), not Willdenow (1811).

Shrubs to small trees, 1–5 m tall. Young shoots tetragonal, narrowly winged. Petiole 6–10 mm; leaf blade lucid and opaque-brown on both surfaces when dry, oblong or oblong-lanceolate, 6–12 × 1.5–3.5 cm, thinly leathery, midvein raised on both surfaces, base cuneate, margin revolute, apex acute, acuminate, or caudate-acuminate. Cyme axillary and terminating short axillary shoots, (1–)3(–5)-flowered, 2.5–3 cm, puberulous. Pedicels 5–8 mm, glabrous. Flowers reddish white. Sepals 4; outer 2: suborbicular, ca. 4 mm; inner 2: obovate, ca. 8 mm. Petals 4, obovate, equal in size, ca. 8 mm. Ovary ovoid; stigma subulate. Mature fruit yellow, ovoid-oblong, 1.2–2 cm, apiculate. Fl. Mar–May, fr. Aug–Oct(–Dec).

Dense or sparse forests on hills; (200–)600–1000 m. S Guangdong, S Guangxi (coast), Hainan [Vietnam].

The roots and leaves are used as medicine for traumatic injuries or rheumatoid arthritis.

3. *Calophyllum polyanthum* Wallich ex Choisy, Descr. Guttif. Inde. 43. 1849.

滇南红厚壳 dian nan hong hou ke

Calophyllum smilesianum Craib; *C. smilesianum* var. *luteum* Craib; *C. thorelii* Pierre; *C. williamsianum* Craib.

Trees ca. 25 m tall. Young shoots gray puberulous, indistinctly tetragonal, old ones terete. Petiole 1–2 cm, adaxially broadly sulcate; leaf blade abaxially usually glaucous, oblong-elliptic or ovate-elliptic, rarely lanceolate, 5.5–9.5 × 2.5–4.3 cm, leathery, midvein raised on both surfaces, base cuneate and decurrent, margin somewhat revolute, apex acuminate but with an obtuse tip. Thyrse terminal, rarely axillary, always shorter than leaf blade; peduncle short or also nearly absent. Pedicel 4–10 mm, densely rusty-puberulous. Flowers white. Sepals ciliolate on margin, apex rounded; outer 2: oblong-ovate or broadly elliptic, rarely obovate, ca. 2.5 mm; inner 2: equal, elliptic-obovate, ca. 4.5 mm. Petals absent. Ovary ovoid, ca. 1.7 mm; stigma peltate. Infructescence usually with 1 or 2 fruit. Fruit globose, 2–2.5 cm, apiculate. Fl. Apr–May, fr. Sep–Oct. $2n = 22$.

Dense forests in valleys; 1100–1800 m. S Yunnan (Jinghong, Lancang) [Bangladesh, Bhutan, N India, Laos, Myanmar, Thailand, Vietnam].

4. *Calophyllum blancoi* Planchon & Triana, Ann. Sci. Nat., Bot., sér. 4, 15: 262. 1861.

兰屿红厚壳 lan yu hong hou ke

Calophyllum changii N. Robson.

Trees. Young shoots tetragonal, glabrous. Petiole 1–1.4 cm; leaf blade elliptic-obovate, 7.2–9 × 3.5–6 cm, leathery, base cuneate, apex rounded or very shortly acuminate. Panicles terminal and axillary, 5.5–8 cm, sparsely rusty villous. Pedicel 5–10 mm, rusty villous. Flower buds globose or oblong. Sepals 4; outer 2: oblong-elliptic, ca. 7.5 mm when in bud, leathery,

rugose, rusty villous on margin. Petals 5, obovate when in bud. Ovary globose. Fruit ovoid to subglobose, 1.1–1.8 cm, apex acute to apiculate.

Taiwan (Lan Yu) [Indonesia (N Kalimantan), Malaysia (Sabah), Philippines].

