

2. HOPEA Roxburgh, Pl. Coromandel 3: 7. 1811, nom. cons., not Garden ex Linnaeus (1767).

坡垒属 po lei shu

Balanocarpus Beddome; *Dioticarpus* Dunn; *Hancea* Pierre (1891), not Seman (1857), nor Hemsley (1890); *Peirrea* F. Heim (1891), nom. cons., not Hance (1877); *Petalandra* Hasskarl (1858), not F. Mueller (1856).

Trees evergreen, of main canopy or understory, white resinous. Stipules caducous, small; leaf blade thinly leathery; lateral veins pinnate; tertiary veins scalariform (in Chinese species) [or subreticulate], margin entire. Flowers sessile or shortly pedicellate, in lax panicles of unilateral racemes; bracts early caducous, linear. Calyx segments imbricate. Exposed parts of petals usually pubescent in bud. Stamens (10–)15, slightly connate and adnate to petals; anthers ovoid, small, subequal; connective appendages aristate or filiform. Ovary ovoid, with prominent filiform style, or hourglass-shaped, with short tapering style. Fruit ovoid or globose; pericarp usually thin, waxy; 1-seeded, closely surrounded by thickened base of calyx segments; 2 fruit sepals winglike, linear, or all orbicular or ovate, subequal.

About 100 species: Cambodia, China, S India, Indonesia, Laos, Malaysia, Myanmar, Papua New Guinea, Philippines, Thailand, Vietnam; four species (one endemic) in China.

These trees are a source of a damar resin used in varnishes. The wood is finely grained, very durable, and used for making boats, bridges, and furniture.

1a. Ovary globose to ovoid, style columnar; flaky barked trees: (Section, subsection *Hopea*).

2a. Two fruit sepals winglike; leaf base obtuse, subequal, lateral veins 9–12 pairs 2. *H. hainanensis*

2b. Fruit sepals subequal, suborbicular; leaf base strongly unequal, subcordate; lateral veins 3–5 pairs 3. *H. reticulata*

1b. Ovary hourglass-shaped; style short, tapering; smooth-barked trees: (Subsection *Pierrea*).

3a. Fruit sepals unequal, two winglike; leaf lateral veins 8–12 pairs 1. *H. chinensis*

3b. Fruit sepals unequal, suborbicular-ovate; leaf lateral veins 7–9 pairs 4. *H. shingkeng*

1. *Hopea chinensis* (Merrill) Handel-Mazzetti, *Sinensia* 2: 131. 1932.

狭叶坡垒 xia ye po lei

Shorea chinensis Merrill, *Philipp. J. Sci.* 21: 503. 1922, not (H. Wang) H. Zhu (1992); *Hopea austroyunnanica* Y. K. Yang & J. K. Wu; *H. boreovietnamica* Y. K. Yang & J. K. Wu; *H. daweishanica* Y. K. Yang & J. K. Wu; *H. guangxiensis* Y. K. Yang & J. K. Wu; *H. hongayensis* Tardieu; *H. jianshu* Y. K. Yang et al.; *H. mollissima* C. Y. Wu; *H. pingbianica* Y. K. Yang & J. K. Wu; *H. yunnanensis* Y. K. Yang & J. K. Wu.

Trees 15–20 m tall, with aromatic white resin. Bark grayish black, smooth. Branchlets reddish brown, white lenticellate, gray stellate-pubescent, gray tomentellate, or glabrous. Petiole dark brown, ca. 1 cm, glabrous or sparsely or densely yellowish pubescent; leaf blade 7–26 × 2–8 cm, oblong to oblong-lanceolate, leathery, abaxially sparsely pubescent or glabrous, adaxially glabrous or both densely stellate-pubescent, lateral veins 8–12 pairs, conspicuously raised abaxially, base rounded or cuneate, slightly asymmetric, margin entire, apex acuminate or caudate-acuminate. Panicle axillary, few flowered, 4–18 cm, slender, sparsely or densely pubescent, with ciliate margin. Sepals imbricate, ovate, glabrous or pubescent. Petals reddish, elliptic, 3–4 mm, yellow tomentose on parts exposed in bud. Stamens (10–)15; anthers ovoid, subequal; connective appendages aristate, ca. 3 × as long as anther. Ovary ovoid; stylopodium cylindrical, slightly swollen, glabrous, ca. 2 × as long as ovary; style short, tapering. Fruit dark brown, ovoid, apiculate; winglike calyx segments oblong-lanceolate or oblong, 8–12 × ca. 2.5 cm, longitudinally 12-veined, glabrous, apex rounded. Fl. Jun–Jul, fr. Oct–Dec.

Valley forests, forests on mountain slopes, hills; 300–600 m. S and SW Guangxi, S and SE Yunnan (Jiangcheng, Lüchun, Pingbian) [N Vietnam].

This is an endangered species threatened by timber exploitation. The durable wood is used for making boats, furniture, and building bridges.

2. *Hopea hainanensis* Merrill & Chun, *Sunyatsenia* 5: 134. 1940.

坡垒 po lei

Trees ca. 20 m tall, with aromatic white resin. Bark gray or brown, flaky, white lenticellate. Petiole robust, ca. 2 cm, glabrous or farinose-scurfy; leaf blade oblong to oblong-ovate, 4–8 × 5–8 cm, thinly leathery, both surfaces glabrous or farinose-scurfy, lateral veins 9–12 pairs conspicuously raised abaxially, base rounded, margin entire, apex slightly obtuse or acuminate. Flowers arranged in lax panicle of unilateral racemes. Sepals ovate, ca. 2.5 mm, apex rounded, outer 2 pubescent on entire surface. Petals oblong or oblong-elliptic, ca. 6 mm. Stamens 15; anthers ovoid; connective appendages filiform, ca. 1 mm. Ovary and stylopodium ovoid, pubescent; style short, glabrous; stigma conspicuous. Fruit ovoid, waxy, apiculate; winglike calyx segments oblong or oblanceolate, 5–7 × ca. 2.5 cm, longitudinally 9–11-veined, sparsely stellate pubescent. Fl. Jun–Jul, fr. Nov–Dec.

Dense forests; ca. 700 m. Hainan [N Vietnam].

This is an endangered species of scattered occurrence. The durable wood is used for making boats and building bridges and houses.

3. *Hopea reticulata* Tardieu, *Notul. Syst. (Paris)* 10: 123. 1942.

铁凌 tie ling

Hopea exalata W. T. Lin et al.; *H. reticulata* Tardieu subsp. *exalata* (W. T. Lin et al.) Y. K. Yang & J. K. Wu.

Trees ca. 15 m tall, with dark brown smooth bark, later becoming flaky, with aromatic white resin. Branchlets initially densely grayish yellow tomentose, soon sparsely so. Petiole 6–8 mm, gray tomentose; leaf blade ovate to ovate-lanceolate, 5–12 × 3–6 cm, leathery, basal veins 5 or 6, lateral veins 3–5 pairs slightly raised abaxially, base oblique or cordate, sometimes rounded, margin entire, apex acuminate. Panicles axillary or terminal, few flowered, 6–11 cm, slender, sparsely pubescent or subglabrous. Calyx segments imbricate, suborbicular, glabrous. Petals reddish, obovate-elliptic, ca. 5 mm, outside tomentose, ciliate at margin. Stamens (10–)15; anthers ellipsoid; connective appendages filiform. Ovary and stylopodium pyriform, with median constriction, glabrous; style short. Fruit ovoid; pericarp thin, glabrous; calyx lobes subequal, short, to 8 × 7 mm. Fl. Mar–Apr, fr. May–Jun.

Forests on mountain slopes, hills; ca. 400 m. Hainan (mountain range between Yaxian and Baoting) [Vietnam].

This is a rare species vulnerable to extirpation. The wood is durable and is used for building houses and bridges and making furniture.

Hopea exalata was earlier separated from *H. reticulata* by having 15 as opposed to 10 stamens, but we find that both numbers are found in each entity and accordingly treat them as conspecific.

4. *Hopea shingkeng* (Dunn) Bor, Indian Forest Rec., Bot. 2: 227. 1941.

西藏坡垒 xi zang po lei

Vatica shingkeng Dunn, Bull. Misc. Inform. Kew 1920: 108. 1920.

Trees evergreen, to 18 m tall, glabrous; bark smooth, brown mottled. Twigs slender. Stipules fugacious; petiole ca. 1 cm; leaf blade 9–15 × 2.5–5 cm, elliptic-oblong to lanceolate, herbaceous, lateral veins 7 or 8 pairs slender but prominent abaxially and impressed adaxially, tertiary veins laxly scalariform, base broadly cuneate, apex caudate. Panicles to 15 cm, lax, slender; flowers buds ca. 8 mm, narrowly ovoid, secund. Sepals broadly ovate, subequal. Petals ca. 8 × 4 mm, lanceolate, pubescent on parts exposed in bud. Stamens 15; anthers oblong; connective appendages ca. 3 × as long as anthers, slender. Ovary and stylopodium hourglass-shaped, with short tapering style. Fruit sepals unequal, 2 outer lobes to 3 × 2 cm, ovate, obtuse; 3 inner lobes to 1.5 cm, narrowly ovate; nut to 1.5 cm, ovoid-globose, apex apiculate.

- Moist evergreen forests; 300–600 m. SE Xizang.

Flora of China 13: 49–51. 2007.