

Hopea macrocarpa (Dipterocarpaceae), a new species from Peninsular Thailand

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ABSTRACT

A new species of the important timber tree family Dipterocarpaceae, *Hopea macrocarpa* Poopath & Sookch., from Hala-Bala forest, Narathiwat, Thailand is described and illustrated. *Hopea macrocarpa* is morphologically similar to *H. mengarawan* Miq. from Peninsular Malaysia, Sumatra and Borneo in its leaf shape, leaf size, leaf blade texture and number of secondary nerves. The new species differs from *H. mengarawan*, however, by having bigger flower buds, bigger fruits and longer fruit stalks.

KEYWORDS: Conservation assessment, Hala-Bala forest complex, *Hopea*, taxonomy.

Published online: 4 October 2017

INTRODUCTION

Finding a new species of Dipterocarpaceae in South-East Asia is unexpected, as the family has probably been more closely examined than any other tree family in Asia. Approximately one-fifth (28 species) of the total number of Dipterocarp species found in Peninsular Malaysia are endemic (Ashton, 1982). Some species are restricted to areas of only approximately 100 square kilometres, for instance, *Hopea sublaceolata* Symington and *Vatica lowii* King, and this appears to be the case with the new species described here: *H. macrocarpa* in the Hala-Bala forest complex in Peninsular Thailand.

The Hala-Bala forest complex is mostly tropical rain forest with vegetation similar to that of northern Malaysia, which it adjoins. The Dipterocarps of the Hala-Bala forest complex were surveyed extensively from 2004–2006 by the first author (Poopath *et al.*, 2012). Ten species and one subspecies of Dipterocarps were newly recorded for Thailand, and one new species was discovered - *H. macrocarpa*.

Hopea contains over 100 species, distributed from Sri Lanka, India, Bangladesh, Burma, southern China, Hainan, Indochina and Malesia; in Thailand, 18 *Hopea* species are recognized (Poopath *et al.*, 2012; Pooma *et al.*, 2017). The genus *Hopea* was placed in the tribe *Shoreae* together with *Dryobalanops*,

Neobalanocarpus, *Parashorea*, and *Shorea* (Ashton, 1982).

The current infrageneric classification of *Hopea* includes two sections and four subsections delimited by Ashton (1982), based on leaf venation, the degree of constriction between the ovary and stylopodium, the density of the flowers on the racemes, and the persistence of the bracteoles. Species in section *Dryobalanoides* are characterized by dryobalanoid or subdryobalanoid venation of leaves whereas scalariform leaf venation is confined to section *Hopea* (Ashton, 1982; Choong *et al.*, 2008). *Hopea* section *Hopea* was further split into two subsections *Hopea* and *Pierrea*, while section *Dryobalanoides* was subdivided into two subsections *Dryobalanoides* and *Sphaerocarpea* (Ashton, 1982). Ashton (1982) reported 26 species of *Hopea* subsection *Dryobalanoides* throughout Malesia. In Thailand, seven described species and one undescribed species of *Hopea* subsection *Dryobalanoides* have been reported (Pooma & Newman, 2001; Poopath *et al.*, 2012; Pooma *et al.*, 2017). According to classification of Ashton (1982), *Hopea macrocarpa* belongs to subsection *Dryobalanoides* in its dryobalanoid or subdryobalanoid venation, fugacious bracteole, ovary without distinct stylopodium, and white to pale yellow petals.

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DESCRIPTION

Hopea macrocarpa Poopath & Sookch., **sp. nov.** — *Hopea* sp., Poopath, Sookchaloem & Santisuk, Thai Forest Bull., Bot. 40: 80, 2012. — *Hopea* sp. 1, Pooma, Poopath & M.F. Newman, Flora of Thailand Vol. 13(4): 617, 2017.

This species is similar to *Hopea mengarawan* Miq. from Peninsular Malaysia, Sumatra and Borneo in shape, size of leaves and coriaceous leaf but differs by smooth to rough bark (vs fissured bark); young twigs and petiole without peltate scales (vs with peltate scales); flower buds ca 6 by 3 mm (vs 2.5–3 by 1.8–2 mm); three short fruiting calyx lobes accrescent wing-like, 15–23 mm long, completely enclosing the nut (vs not accrescent wing-like, 3–6 mm long, not completely enclosing the nut) and fruit stalks 2–3 mm long (vs 1–2 mm long) (See Table 1). Type: Thailand, Narathiwat, Sukhirin, Ban Phu Khao Thong, alt. 250 m, 15 May 2005, fl., *Poopath B105* (holotype **BKF!** [BKF193891], isotype **BKF!** [BKF193892]). Figs. 1–2.

Tree 20–30 m tall, buttresses more or less acute, frequently with stilt roots, bark smooth to rough, inner bark dark pink to dark red, resin exudations translucent, white. *Young twigs* sparsely pubescent, becoming glabrous, without peltate scales, lenticellate. *Stipules* ovate to oblong, 2–3 by 1.5–2 mm, apex obtuse, pubescent outside. *Leaves* elliptic, elliptic-ovate to broadly ovate, 6–11 by 3–6 cm, coriaceous to thickly coriaceous, glabrous or white waxy on both surfaces; base cuneate to obtuse, symmetrical; margin slightly revolute; apex subcuspidate, to ca 1 cm long; secondary nerves dryobalanoid to subdryobalanoid, (10–)14–18 on each side, base pair continuing as intramarginal nerves, reaching to one-third of marginal leaf length on each side; tertiary nerves reticulate to scalariform-reticulate; midrib raised on both side; petioles 0.7–1.2 cm long, glabrous; domatia absent. *Inflorescence* 1.5–4 cm long, lax, erect, sparsely puberulent with brown peltate scales; bracteole fugacious. *Flower buds* ovoid, ca 6 by 3 mm; pedicels ca 2 mm long. *Calyx lobes* broadly ovate, subequal, sparsely pubescent, brown peltate scale outside, ciliate at tip; 2 outer with acute apex, ca 3 by 2.2 mm; 3 inner with obtuse apex, 3.2 by 2.7 mm. *Petal* falcate-oblong, ca 8 by 2–3 mm, apex acuminate and undulate, white to pale yellow. *Stamens* 15, in 2 whorls; filaments 0.5–0.8 mm long; anthers subglobose, ca

0.2 mm diam.; connective-appendages 1–3 times as long as the anthers, scattered glandular papillose. *Ovary* ovoid, ca 1 by 0.8 mm, glabrous; stylopodium absent, attenuate to style; style slender, ca 1.3 mm long, glabrous. *Fruiting calyx lobes* glabrous, saccate at base, deeply thickened, oblong or oblong-ovate, 7–8 by 5–7 mm, both side margins wing-like, to 2 mm wide; 2 large fruiting calyx lobes wing-like, spatulate to oblanceolate, 3.5–6.5 by 1–2 cm, light green when young, veins 7–9; 3 short fruiting calyx lobes, ovate-lanceolate, 1.5–2.3 by 0.4–0.5 cm, apex accrescent shortly winged to 2 cm long, completely enclosing the nut. *Nut* ovoid, 1–1.2 by 0.7–0.8 cm, glabrous; style remnant, filiform; cone-like at fruit base, tapering from longer lobes to fruit pedicel, swollen and thickened receptacle, 3–4 mm tall; fruit stalks 2–3 mm long.

Thailand.—PENINSULAR: Narathiwat [Sukhirin, Ban Phu Khao Thong, alt. 250 m, 15 May 2005, *Poopath B105* (BKF); *ibid*, alt. 250 m, 11 July 2005, *Poopath B118* (BKF); Waeng, Hala-Bala Wildlife Sanctuary, alt. 220 m, 8 June 2004, *Poopath B24* (BKF); *ibid*, alt. 300 m, 22 July 2004, *Poopath B39* (BKF); *ibid*, alt. 200 m, 10 July 2005, *Poopath B110* (BKF); *ibid*, alt. 50 m, 10 July 2005, *Poopath B113* (BKF)].

Distribution.— Endemic to Thailand, known only from Narathiwat Province.

Ecology.— Tropical rain forest, foot hills to ridges, 50–300 m alt., rather rare, associated with lowland *Dipterocarps* species, i.e. *Dipterocarpus grandiflorus* (Blanco) Blanco, *Shorea parvifolia* Dyer, *S. singkawang* (Miq.) Miq., *Hopea pedicellata* (Brandis) Symington, *H. latifolia* Symington, *H. bracteata* Burck and *Vatica bella* Slooten.

Phenology.— Flowering: March–May; fruiting: June–August.

Vernacular.— Chan hom (ชันหอม).

Etymology.— The specific epithet '*macrocarpa*' refers to the large fruit.

IUCN Conservation Status.— Vulnerable (VU B2ab(iii)) (IUCN, 2001). The species is known only from the type locality, a rather scattered population in eastern Hala-Bala forest. The species has a restricted distribution near Narathiwat Thailand-Kelantan Malaysia border, and all individuals were found within a 50 km radius.

Table 1. Morphological differences between *Hopea macrocarpa* and *H. mengarawan*

Characters	<i>H. macrocarpa</i>	<i>H. mengarawan</i>
Bark	smooth	fissured ¹
Indumentum	young twigs, petiole and leaves beneath without peltate scales	young twigs, petiole and leaves beneath with peltate scales ^{1,2,3}
Flower buds	ca 6 by 3 mm	2.5–3 by 1.8–2 mm ^{2,3}
Style	glabrous	villose near base ^{2,3}
Two large fruiting calyx lobes	spathulate to oblanceolate, 3.5–6.5 by 1–2 cm	narrowly spathulate, 3–4(–7) by 0.8–1 (–1.2) cm ^{2,3}
Three short fruiting calyx lobes	ovate-lanceolate, apex accrescent wing-like to 2 cm long, 15–23 by 4–5 mm, completely enclosing the nut	ovate, apex acute (not accrescent wing-like), 3–6 by 3–5 mm, not completely enclosing the nut ^{2,3}
Size of three short fruiting calyx lobes	15–23 by 4–5 mm	3–6 by 3–5 mm ^{2,3}
Nuts	1–1.2 by 0.7–0.8 cm	0.7–1 by 0.3–0.5 cm ^{2,3}
Fruit stalks	2–3 mm long	1–2 mm long ^{2,3}
Ecology	tropical rain forest, foot hills to ridges, 50–300 m. alt.	swamp forest or tropical rain forest. It favours low-lying often swampy land, river bank, or land subject to inundation, but it has also been found on low hills ^{1,2,3}
Distribution	Thailand (Narathiwat)	Sumatra, Borneo, Peninsular Malaysia (Kelantan, Trengganu, Pahang, Selangor, Negeri Sembilan, Johor), and Singapore ¹

¹ Symington *et al.* (2004)
² Ashton (1982)
³ Refer to specimens examined.— Peninsular Malaysia: Pahang [Pekan, 4 m alt., 10 Apr. 1962, fl., Kepong field No. 99956 (**KEP, A, SING, BO, PNH, US, OX, BKF!**)]; Pahang [5 Jul. 1962, fr., *Hussin s.n.* (Kepong field No. 99574) (**KEP, K, A, L, SING, PNH, US, BKF!, SARF, OX**)]; Selangor [Forest research institute, Kepong, 29 Apr. 1955, fl., *K.M.K. s.n.* (Kepong field No. 71976 (**KEP, BKF!**)), *ibid* [65 m alt., 19 Feb. 1962, fr., Kepong field No. 98174 (**KEP, BKF!**)]; Singapore [28 Feb. 1939, fr., *Ngadiman s.n.* (Singapore field No. 36353) (**SING, BKF!**)]; Sumatra: Upper Riouw [15 Aug. 1960, fl., *Soepadmo 67* (**BO, BKF!**)]

ACKNOWLEDGMENTS

The authors are grateful to Bob Harwood for reading the manuscript. Special thanks are due to curators and staff of the forest herbarium (BKF) for their hospitality in our study.

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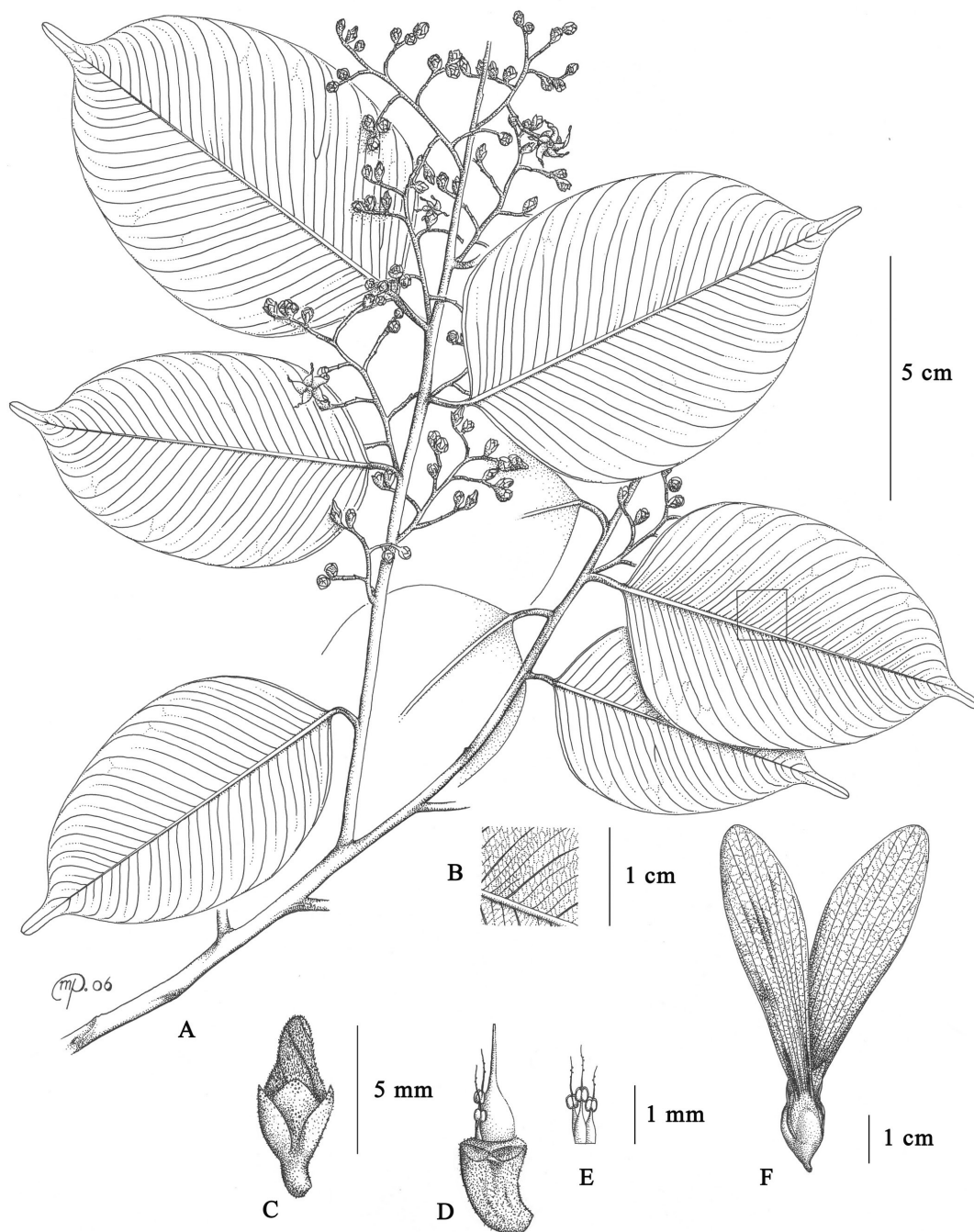


Figure 1. *Hopea macrocarpa* Poopath & Sookch.: A. habit & inflorescences; B. tertiary nerves scalariform-reticulate on lower surface of leaf; C. flower buds; D. ovary & stamens; E. stamens; F. fruit. Drawn by Manop Poopath.



Figure 2. *Hopea macrocarpa* Poopath & Sookch.: A. stilt roots & bark; B. resin; C. inner bark; D. inflorescences; E. flowers; F. fruit. Photographed by Manop Poopath.