

Notes on the genus *Ormosia* (Fabaceae-Sophoreae) in Thailand

SAWAI MATTAPHA^{1,*}, SOMRAN SUDDÉE² & SUKID RUEANGRUEA²

ABSTRACT

Ormosia mekongensis Mattapha, Suddee & Rueangr. is described as a new species and illustrated. Its conservation status is assessed and its distribution is mapped. Three other species, *Ormosia grandistipulata* Whitmore, *O. penangensis* Ridl. and *O. venosa* Baker, are updated for the generic account for the Flora of Thailand: the first could now be fully described, because flowers were found, the latter two are new records for peninsular Thailand.

KEYWORDS: Lectotypifications, Mekong, new species, new record, Peninsular Thailand.

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INTRODUCTION

Ormosia Jacks., a genus in the tribe Sophoreae of the Leguminosae, comprises approximately 90 species distributed in Asia, the Americas and Australia (Queensland) (Lewis *et al.*, 2005). The genus was revised for Thailand by Niyomdham (1980), who accepted eight indigenous species, and here we add three species, which bring the total number of *Ormosia* species for the Flora of Thailand account to 11. The three species that are new to Thailand are *O. mekongensis* Mattapha, Suddee & Rueangr., *O. penangensis* Ridl. and *O. venosa* Baker. The species newly described here, *O. mekongensis*, is most similar to *O. henryi* Prain but differs in having the calyx glabrous on the inner side (densely hairy on both sides in *O. henryi*), the standard lacking basal callosities (present at the claw on the inner side in *O. henryi*), and pods that are 1–2-seeded (up to 10 in *O. henryi*). *Ormosia penangensis* and *O. venosa* are from peninsular Thailand. Additionally, we provide the first full description of the flowers of *O. grandistipulata* Whitmore as the flowers were unknown when first published by Whitmore (1969).

DESCRIPTIONS

1. *Ormosia grandistipulata* Whitmore, Gard. Bull. Singapore 24: 6. 1969; Tree Fl. Malaya 1: 301. 1972;

Niyomdham, Thai Forest Bull., Bot. 13: 5, f. 2. 1980. Type: Malaysia, Trengganu, 1955, *Sinclair & Kiah bin Salleh SFN 40851* (holotype SING; isotypes K!, L!-digital images).

Tree 10–15 m tall; young shoots, inflorescences and calyces pubescent. *Leaves*: rachis 20–25 cm long, apex acute, puberulous; petioles 6–10 cm long; stipules large, ovate, 2–5 by 1–3 cm, puberulous on both sides, persistent; leaflets 9–13, coriaceous, oblong-obovate, 4–18 by 2.5–8 cm, upper surface glabrous, lower surface glabrescent, sparsely hairy along midrib; apex acuminate to cuspidate, base cuneate; secondary veins 8–10 pairs. *Inflorescence* a terminal panicle, 25–30 cm long, pubescent; secondary axes up to 16 cm long; bracts similar to stipules but much smaller, puberulous; bracteoles similar to bracts, ca 1 by 0.5 mm, inserted at top of pedicels, outside hairy, inside glabrous. *Pedicels* ca 3 mm long, hairy. *Calyx* campanulate, 3–3.5 mm long; lobes triangular, apex acute, both sides densely hairy, upper lobes 2, ca 3 by 3–4 mm, lower lobes 3, ca 2 by 3.4–4 mm. *Corolla* creamy white; standard obovate with basal callosities, 7–8 by 9.5–10 mm, apex retuse, base minutely auriculate, margin entire, both sides glabrous, claw ca 2 mm long; wings oblong, ca 6 by 3 mm, apex obtuse, base minutely auriculate, margin entire, both sides glabrous, claw ca 3 mm long; keels

¹ Department of Biology, Faculty of Science, Udon Thani Rajabhat University, Udon Thani 41000, Thailand.

² Forest Herbarium, Department of National Parks, Wildlife and Plant Conservation, Chatuchak, Bangkok 10900 Thailand.

* Corresponding author: Indigoferasawai@gmail.com

falcate, ca 6 by 3–3.5 mm, apex obtuse, base minutely auriculate, margin entire, both sides glabrous, claw 4.5–5 mm long. *Stamens* 10, all free; filaments glabrous, short ones ca 7 mm long, long ones ca 10 mm long; anthers more or less flattened, ca 0.8 by 0.5 mm. *Ovary* with 2 ovules, hairy at base and along sutures; stipe ca 2 mm long; style 5–6 mm long, glabrous; stigma small. *Pods* elliptic-oblong, fleshy, glabrous, 4–5 by 2–3 cm; valves thickened, coriaceous, yellow to yellowish brown when mature, glabrous. *Seeds* 1(–2), laterally compressed, ca 25 by 15 mm; testa hard, scarlet, papillate, not easily separable from the cotyledons.

Thailand.— PENINSULAR: Songkhla, Yala.

Distribution.— Peninsular Malaysia (type).

Ecology.— Evergreen forest, ca 50 m alt. Flowering April–May; fruiting June–July.

Vernacular.— Phai chang (โพช้าง).

Specimens examined.— *Komnerdpriwan & Leeratiwong 16-968 (PSU)*.

Notes.— Whitmore (1969) described *Ormosia grandistipulata* based on a carpological collection (*Sinclair & Kiah bin Salleh SFN 40851* from Trengganu, Malaysia). He had no information about the flowers, but distinguished the species from the other *Ormosia* species by its spectacular, large stipules, and subsequently, Niyomdham (1980) could not add the floral characters. Recently, we obtained a flowering collection from Sadao district, Songkhla province, Thailand, and we describe the floral characters here. In addition to the key characters given by Whitmore (1969), the species has a glabrous corolla, a standard with basal callosities, and ovary with dense hairs at the base and along the sutures. The description of leaf and pod characters given above follows Niyomdham (1980) with some modifications.

2. *Ormosia mekongensis* Mattapha, Suddee & Rueangr., *sp. nov.*

Resembling *Ormosia henryi* Prain but distinguished by the absence of basal callosities, the densely hairy ovary covered by adpressed hairs, and the discoid pods instead of basal callosities present, etc. Type: Thailand, Phu Phan National Park, alt. 320 m, 11°1'17" N 103°59'29" E, 29 Apr., 2017,

Mattapha, Suddee & Rueangruea 1164 (holotype **BKF!**; isotypes **BK!**, **BKF!**, **E!**, **K!**, **KKU!**, **L!**, **P!**, **QBG!**). Figs. 1–2.

Tree 10–15 m tall, young shoots, rachis, inflorescences and calyces, with short hairs. *Leaves* imparipinnate; rachis 4–8 cm long, densely hairy; petioles 2–4 cm long; stipules absent; ultrajugal part up to 2 cm long. *Leaflets* 5–7, elliptic, 5–6 by 1.5–2 cm, apex acuminate, base cuneate, coriaceous, margin entire, upper surface glabrous, lower surface hairy with scattered adpressed hairs, glaucous; petiolules ca 5 mm long; secondary veins 6–8 pairs. *Inflorescence* a terminal panicle or sometimes with axillary racemes, 8–10 cm long, densely hairy. *Pedicels* 5–6 mm long, densely hairy. *Calyx* campanulate, 2.5–3 mm long, persistent, becoming woody in fruit; lobes triangular, 4–5 by 3.5–4 mm, longer than the tube, apex acute, both sides densely hairy, upper lobes 2, lower lobes 3. *Corolla* light yellow or light pink, slightly fragrant; standard orbicular with a green patch at the base on the ventral side, 10–12 by 9–10 mm, apex emarginate, base tapering to claw, margin entire, both sides glabrous, claw ca 3 mm long; wings oblong, 9–10 by ca 4 mm, apex obtuse, base slightly auriculate, both sides glabrous with a green path at base on the inner side, claw ca 3 mm long; keels oblong-elliptic, 8–9 by ca 4 mm, apex acute, based slightly auriculate, outside hairy along median vein, inside glabrous, claw ca 5 mm long. *Stamens* 10, all free; filaments flattened, 10–12 mm long, glabrous; anthers ca 1 by 0.5 mm, glabrous. *Ovary* densely adpressed hairy; ovules 1–3; style 8–9 mm long, glabrous. *Pods* flattened, discoid, convex at centre, 2.2–2.4 by 2.8–3.3 cm, woody, brown to grey when dry, hairy, dehiscent, slightly septate, margin crested. *Seeds* 1(–2), orbicular to ellipsoid, 0.8–2 by 1–1.5 mm, bright red.

Thailand.— NORTH-EASTERN: Sakon Nakhon (Phu Phan National Park, alt. 320 m, 11°1'17" N 103°59'29" E, 29 Apr., 2017, *Mattapha et al. 1164* (holotype **BKF!**; isotypes **BK!**, **BKF!**, **E!**, **K!**, **KKU!**, **L!**, **P!**, **QBG!**); EASTERN: Ubon Ratchathani, (Khong Chiam, Dong Na Tham Forest, Pha Taem National Park, dry evergreen forest on the way to Pha Cha Na Dai, alt. 440 m, 28 Feb. 2007, *Suddee et al. 3064* (paratype **BKF!**).

Distribution.— Only known from Thailand, but likely to be found in Laos in areas near the Mekong river (Fig. 3).

Ecology.— Dry deciduous to dry evergreen forests, 320–500 m alt. Flowering April–May; fruiting June–July.

Vernacular.— Ma klam mae khong (มะกล่ำแม่โขง).

Conservation status.— According to the IUCN threatened criteria (IUCN, 2012), we assess it as Data Deficient (DD) because of its small population size with a few individuals for each locality; a further

assessment should be carried out when more data is available.

Notes.— *Ormosia mekongensis* is also similar to *O. penangensis* Ridl. in leaf and inflorescence size but differs by having the standard without a hood at the apex (with hood in *O. penangensis*), free of the keel petals (fusion in *O. penangensis*), ovary with 1–3 ovules (2–6 in *O. penangensis*) and much smaller pods (4.5–10 cm long in *O. penangensis*).

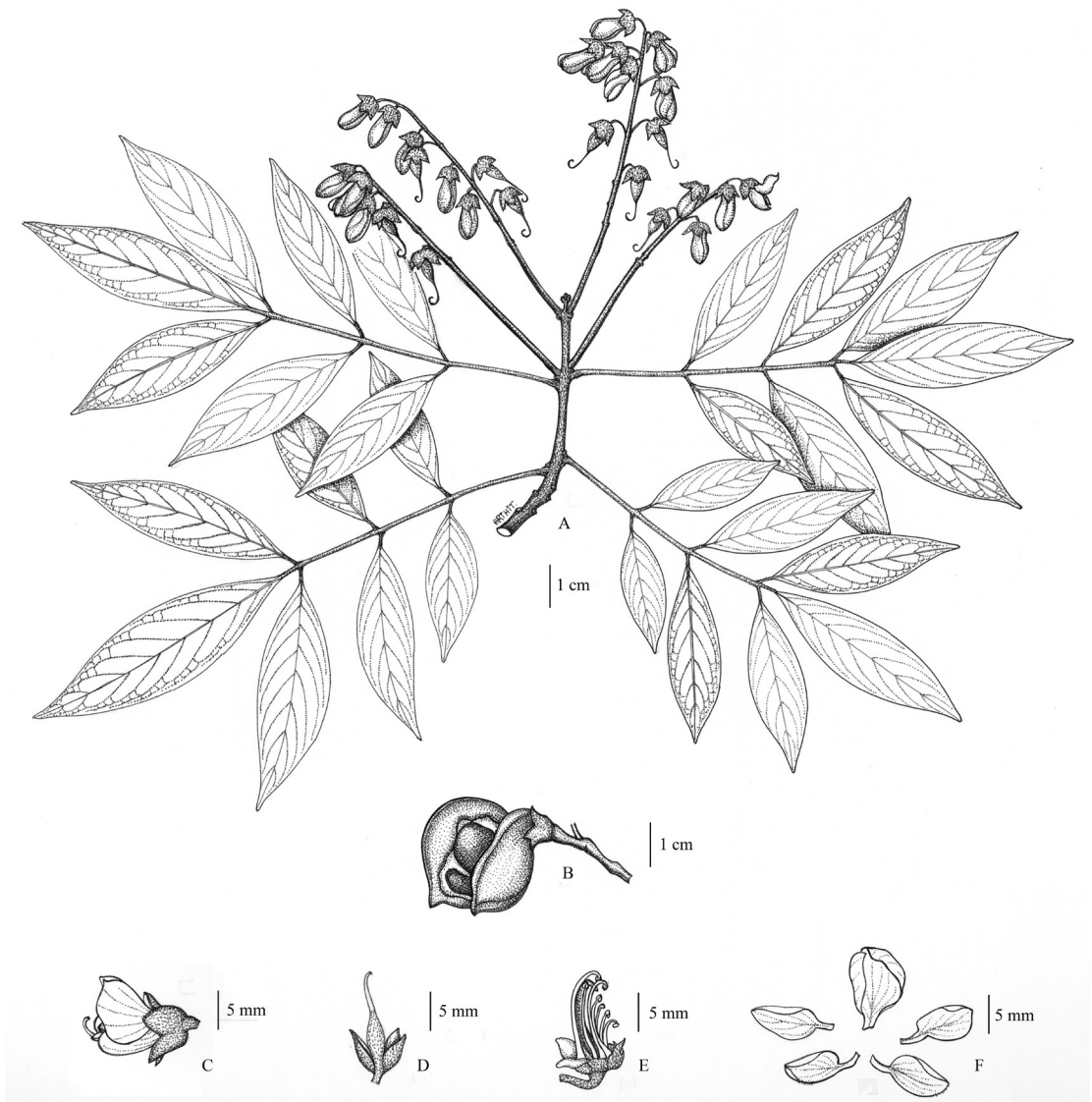


Figure 1 *Ormosia mekongensis* Mattapha, Suddee & Rueangr.; A. Habit and inflorescence; B. Pod; C. Flower; D. Ovary with persistent calyx; E. Stamens; F. Dissected flower: standard petal (upper), wing petals (lateral ones), keel petals (lower ones). A & C–F from Mattapha et al. 1164 (BKF); B. from Suddee et al. 3064 (BKF). Drawn by A. Khamkamneod.



Figure 2 *Ormosia mekongensis* Mattapha, Suddee & Rueangr.: A. Inflorescences; B. Pods. Photos by S. Mattapha (A) & P. Trisarasi (B).

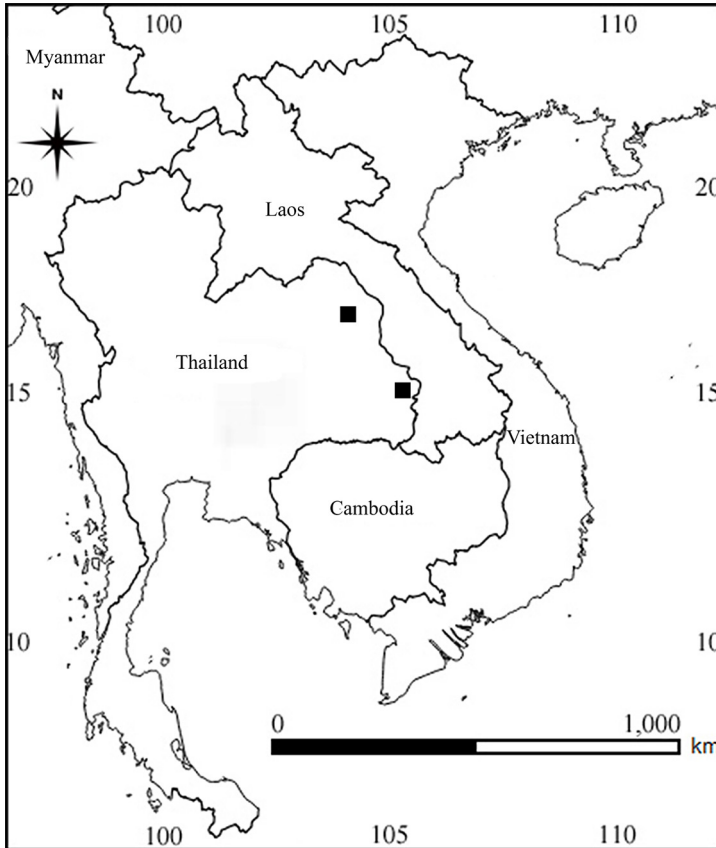


Figure 3. Known distributions of *Ormosia mekongensis* Mattapha, Suddee & Rueangr. The map was created using QGIS version 2.14.1-Essen (QGIS Development team, 2016).

3. *Ormosia penangensis* Ridl., J. Straits Branch Roy. Asiat. Soc. 68: 11. 1915; Fl. Malay Penins. 1: 613. 1922; Merr. & Chen, Sargentia 3: 83. 1943; van Meeuwen, Reinwardtia 6: 233. 1962; Backer & Bakh.f., Fl. Java 3: 650. 1968; Whitmore, Tree Fl. Malaya 1: 301. 1972; van Steenis, Reinwardtia 10: 22. 1982.— *Fedorovia penangensis* (Ridl.) Yakovl., Nov. Syst. Pl. Vasc. 10: 195. 1973. Type: Malaysia, Penang, Government Hill at Grace Dieu, *Mohammed Haniff 16338* (lectotype **BM!** BM000958791-digital image, designated here; isolectotypes **L!**- L0019168-digital image, **SING**).
— *O. incerta* Koord., Atlas Baumart. Java 4: pl. 798. 1918; Merr. & Chen, Sargentia 3: 82. 1943; Backer & Bakh.f., Fl. Java 1: 577. 1963. Java. Type: Indonesia (Java), *Koorders 42648B* (lectotype **L!** L0416467-digital image, designated here; isolectotype **L!** L0019169-digital image).

Tree ca 12–25 m tall; young shoots, inflorescences and calyces pubescent. *Leaves*: rachis 1.6–11 cm long, pubescent to glabrescent; stipules indistinct; petioles 0.8–3.8 cm long; leaflets 3–7, coriaceous, elliptic-oblong, 2.5–9.7 by 1.8–4.5 cm, upper surface glabrous, lower surface glabrescent to sparsely hairy, glaucous, apex acute to acuminate with minutely apiculate, base cuneate to obtuse, margin entire; petiolules 2–5 mm long; secondary veins 7–12 pairs. *Inflorescence* not seen. *Pods* subglobose to oblong, septate between seeds, subdiscoid if 1-seeded, 4.5–10 by 2.8–4.5 cm, woody, rugose, densely hairy with brown hairs, margin crested; valves thickened; stipe 0.5–2.3 mm long. *Seeds* 2–6, ovoid, laterally compressed, 15–28 by 15–25 mm, reddish brown, smooth.

Thailand.—PENINSULAR: Yala (Than To district, Khao Hin Yok), Narathiwat.

Distribution.— Peninsular Malaysia (type).

Ecology.— Disturbed evergreen forest on thin soil over quartzite and on limestone mountain in evergreen forest, 450–500 m alt. Fruiting December–February.

Vernacular.— Phai penang (ไฟปีนัง).

Specimens examined.— *Middleton et al.* 2940 (BKF); *Puudjaa & Cholkulchana* 736 (BKF).

Notes.— *Ormosia penangensis* was only previously known in Myanmar, Malaysia and Indonesia. The collections, bearing up to six seeds per fruits, have recently been collected in peninsular Thailand. The collection of *Mohammed Haniff* 16338 (BM000958791; Natural History Museum, 2014) is selected as the lectotype for *O. penangensis* because it is in a better condition when we compare to the other syntypes. *Koorders* 42648B (L0416467) at L is selected here as the lectotype for *O. incerta* (the heterotypic synonym of *O. penangensis*) as it is a well preserved specimen.

4. *Ormosia venosa* Baker in Hook.f., Fl. Brit. India. 2: 254. 1878; Prain in King, J. Asiat. Soc. Bengal 66: 152. 1897; Ridl., Fl. Malay Penins. 1: 615. 1922; Merr. & Chen, Sargentia 3: 84. 1943; van Meeuwen, Reinwardtia 6(3): 236. 1962; Whitmore & Tantra, Tree. Fl. Indon. Checkl. Sumatra 132. 1984. Type: Malay Peninsula, Malacca, *Maingay* 2453A (lectotype K! K000263636-designated here; isolectotype L! L2039297-digital image).

Tree ca 28 m tall; young shoots, inflorescences and calyces tomentose. *Leaves*: rachis 1–2 cm long when flowering, up to 5 cm long when fruiting, densely hairy with velvety brown hairs or tomentose; petioles 1.5–3 cm long; stipules ca 2 by 7 mm, caducous; leaflets 5–7, oblanceolate, 3–4 by 1–2 cm when flowering, larger when fruiting, 8–10 by 4–5 cm, upper surface glabrous, dark green, lower surface densely tomentose with yellow-brown hairs; apex acute to retuse or emarginate, base cuneate; secondary veins 10–12 pairs, raised below, parallel. *Inflorescence* a terminal panicle, 10–15 cm long, tomentose; bracts 5–8 mm long, ovate, subpersistent; bracteoles similar to bracts, ca 4 by 2 mm, inserted at the top of pedicels, tomentose. *Pedicels* 5–6 mm long, tomentose. *Calyx* campanulate, 6–7 mm long; lobes triangular, 3–4 by ca 3 mm, apex acute, both

sides densely hairy with short yellow-brown hairs, upper lobes 2, lower lobes 3. *Corolla* white to yellowish with a green tinge at the middle of standard; standard orbicular, with basal callosities, 7–8 by 9.5–10 mm, apex retuse, base inauriculate, margin entire, claw ca 2 mm long; wings 8–9 by 2.5–3 mm, apex obtuse, base inauriculate, margin entire, sculptured, claw ca 2 mm long; keels 8–9 by 2.5–3 mm, base inauriculate, margin entire, claw ca 3 mm long. *Stamens* 10, all free; filaments glabrous, shorter ones 6–7 mm long, longer ones 9–10 mm long; anthers ca 0.8 by 0.5 mm. *Ovary* 1–2-ovuled, hairy with brown hairs; stipe ca 2 mm long; style 8–10 mm long, glabrous; stigma small. *Pods* ovate to obovate, 4–5 by 2–3 cm, fleshy, woody, yellow when mature, glabrous; valves thickened. *Seeds* 1(–2), oblong-elliptic, ca 15 by 15 mm, bright orange.

Thailand.— PENINSULAR: Songkhla, Phangnga.

Distribution.— Peninsular Malaysia (type).

Ecology.— Evergreen forest, ca 280 m alt. Flowering January–March; fruiting April–July.

Vernacular.— Kasae met som (กะแซะเม็ดส้ม).

Specimens examined.— *Gardner & Sidisunthorn* ST1955 (BKF) & ST2245 (BKF).

Notes.— *Ormosia venosa* is characterised by the oblanceolate leaflets, which are densely covered with a brownish tomentum on the lower surface and the brownish-tomentose inflorescences, the standard with basal callosities, and the pods that are 1–2-seeded. The species was originally believed to occur only in India, Malay Peninsula and Indonesia, but two collections with flowers and fruits are now known from peninsular Thailand. The species resembles *O. pachycarpa* Champ. ex Benth. but differs by its glabrous pods with red seeds (tomentose pods with black seeds in the latter species).

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