

A NEW TREE SPECIES (SAPOTACEAE) AND A NEW SPECIES RECORD FOR THAILAND (FLACOURTIACEAE) FROM KHAO YAI NATIONAL PARK

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ABSTRACT

A new species of tree, *Pouteria stellibacca* Maxw. (Sapotaceae), and a new species record for Thailand, *Homalium cochinchinense* (Lour.) Druce (Flacourtiaceae), have been discovered in the Mo Singto area of Khao Yai National Park, Central Thailand, at about 14° N latitude. The *Pouteria* trees, reaching 35 m in height, are deciduous, buttressed, and have (among other distinct characters) 5-lobed fruit. Their vegetative and reproductive characters are described herein. Both species were found in primary, seasonal evergreen forest, the *Pouteria* at 775–780 m and the *Homalium* at about 800–1175 m elevation.

Key words: *Pouteria*, *Homalium*, Flacourtiaceae, Sapotaceae, Khao Yai National Park, new record, new species

INTRODUCTION

While studying gibbons in the Mo Singto area of Khao Yai National Park 0.5–0.8 km west of park headquarters, Nakhon Nayok Province, a large canopy tree with unusual fruit was discovered which turned out to be a new species in Sapotaceae. Only four other species of *Pouteria* are known from Thailand (CHANTARANOTHAI, 1999). Only 4 individuals of this tree over 10 cm in diameter occur on the 30-ha forest dynamics plot in the area. An additional 4 large trees have been found within 0.5 km of the Mo Singto Plot, and an additional tree about 5 km away in the Khlong Sai area to the south, at the same elevation. The pentamerous star-shaped fruit strikingly resembles that depicted for *Eberhardtia* sp. in AUBRÉVILLE (1963), but leaf, floral, and other characters do not match.

An additional species of tree which is a new record for Thailand, *Homalium cochinchinense* (Lour.) Druce (Flacourtiaceae), was also discovered on the plot; it is also rare.

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***Pouteria stellibacca* Maxw. sp. nov. (Sapotaceae)
sect. *Oligothea* (A. DC.) Baeh.
(Figs. 1–8)**

Flores bisexuales 5-meri plerumque fasciculati, corolla tubulosa ad rotata lobis prominentibus, antherae stylusque corolla inclusus, ovarium hirsutum plerumque 5-loculare, semina prominente lateraliter compressa, hilo prominenti elongato, endospermium plerumque adest.

Arbor decidua 25–35 m alta 68–90 cm diam. ad 4 m altitudine, anteridibus prominentibus ad 3.6 m altis, cortice tenui plerumque laevi, succo sparso albo, novellis dense rufo-tomentosis glabrescentibus. Petioli 15–35 mm longi indumento novellorum simili maturitate glabrescentes. Laminae subcoriaceae obovatae 16–20 cm longae pinnatinervae, apice acuto, basi cuneata marginibus integris, nervatione distincta supra impressa subtus prominenti, nervis lateralibus 7–9 paribus suboppositis arcuatis craspedromis marginem non attingentibus nec confluentibus, venatione ultima distincta reticulata, laminae immaturis utrinque indumento novellorum simili maturitate glabrescentibus. Flores ramiflori in ramulis annotinis 10–14 in quoque nodo fasciculati, 5-meri. Pedicelli 2.5–3.0 mm longi indumento novellorum simili in fructu incrassati 5–7 mm longi. Sepala quincuncialia suborbicularia 2.5–3.0 mm diam. apice obtuso extus parte exposita pilosa parte obtecta et intus glabra. Corolla tubulosa c. 7 mm longa glabra alba, tubo c. 4 mm longo, lobis ligulatis c. 3 mm longis apice truncato. Staminodia in lorum sinibus inserta subulata c. 2 mm longa glabra. Stamina oppositipetala supra 3/4 tubi inserta inclusaque glabra, filamentis c. 1.5 mm longis, antheris ovatis c. 1 mm longis. Discus deest. Ovarium 5-loculare 5-lobatum subglobosum obtusum dense pilis erectis brunneis velutinum, stylus inclusus subulatus crassus c. 4 mm longus, stigma minutum. Bacca subglobosa oblata profunde 5-lobata in vivo siccoque ad instar stellae in sectione transversali 22–25 mm longa 28–30 mm in diam. ubi in vivo 19–21 mm longa 19–22 mm in diam. ubi in sicco glabra viridis ubi juventute ad atrorubra ubi maturitate. Semina 5 obovata lateraliter compressa biconvexa c. 18 mm longa c. 10 mm lata basi apiceque rotundato retusa ad hilo, hilo lineari semine fere aequilongo, testa dura c. 1 mm crassa in vivo atrobrunnea, endospermio distincto.

Holotype: P. CharoENCHAI 1024 (CMU), Khao Yai National Park, Muang District, Nakhon Nayok Province, Thailand (14°24.5' N, 101°23' E), Klong Sai area, 760 m, 8 March 2001, flowers; isotypes: A, BKF, CAS, L, Mahidol University (Salaya).

Paratypes: P. CharoENCHAI 942 (same tree as holotype & isotypes), fruits, 5 June 2000 (distribution as above); P. CharoENCHAI 785 (same tree as holotype and isotypes), flowers, 11 May 1999; P. CharoENCHAI 1026 (same location & distribution as above), flowers, 26 April 2001; A. Boonkongchart & N. Tanthana 108 & 109 (same location & distribution as above), flowers, 30 March 2002; W. Y. Brockelman 60, south of Mo Singto plot, Khao Yai National Park, 760 m; fruits, 27 August 1998 (Mahidol University–Salaya, BKF, and CMU)

The distinctive features of section *Oligothea* are: flowers bisexual, 5-merous, mostly in fascicles, corollas tubular or rotate, lobes prominent, anthers and style included in the corolla; ovary hirsute, mostly 5-locular; seeds prominently laterally flattened; hilum prominent, elongate; usually with endosperm (BAEHINI, 1942; PENNINGTON, 1991).

Description.—Deciduous canopy tree 25–35 m tall (Figs. 2–5), diameter measured above the buttresses 68–90 cm; buttresses prominent, to 3.6 m high; *bark* thin, smooth to sometimes slightly flaking, with scattered, shallow cracks, gray to gray-brown; cut bark (Fig. 7) whitish with fine orange speckling, wood yellow-white; sap sparse, white. Young *branchlets* terete, angular when dry, densely covered with brown tomentum; older branches glabrous, epidermis grey. *Leaves* (Fig. 1) spirally arranged, distal on the branchlets; blades subcoriaceous, obovate, tip acute, base cuneate, entire; main nerves prominent, sunken above, raised below; secondary venation pinnate, with 7–9 ascending, subopposite nerves on each side of the midnerve; arching and not reaching the margin; finest venation distinct, reticulate; both surfaces of immature blades with indumentum as on the branchlets, glabrescent at maturity; green above, pale green below; 12–24 (modal length 18–19) x 6–11 (modal width 9) cm. *Petioles* with glabrescent indumentum as on the branchlets and blades, 15–35 mm long. *Stipules* none. *Inflorescences* below and developing with the new leaves, on second year, leafless (*i.e.* ramiflorous) branchlets, in dense, less often spaced fascicles; nodosities distinct, finely puberulous. Flowers 10–14 per node. Bracts at the base of the pedicels, brown hirsute, *c.* 1 mm long. *Pedicels* with light brown, villous indumentum, 2.5–3.0 mm long. *Sepals* in a single whorl, quincuncial, equal, sub-orbicular, obtuse, the exposed surfaces thickened, pale green, and finely brown pilose outside, imbricated surfaces thinner with the entire inside glabrous; light green and drying light brown, *c.* 2.5–3.0 mm diameter. *Corolla* tubular, glabrous, pale green, white, 3–4 mm long; tube *c.* 3 mm long; lobes erect, ligulate, tip truncate, minutely erose; 1.5 mm long. *Staminodes* subulate, glabrous, inserted in the sinus of the corolla lobes, 1.5–2.0 mm long (*i.e.* $c. \frac{3}{4}$ as long as the corolla lobes). *Stamens* oppositipetalous, glabrous, inserted in the upper $\frac{3}{4}$ of the corolla tube (*i.e.* below the staminodes), extending to about half the length of (*i.e.* include in) the corolla lobes. Filaments cream-pale green, 1.0–1.5 mm long; anthers ovate, cream, tip acute with a minute connective extension, *c.* 1 mm long. Disc none. *Stigma* minute, slightly narrower than the style, glabrous, light green. Style stout, pale green, glabrous, *c.* 2 x 0.5 mm; included in the corolla. *Ovary* depressed globose, cream, *c.* 1.0 x 1.5 mm; densely covered with erect, brown, velutinous indumentum; shallowly 5-lobed and 5-locular. *Berries* depressed globose, glabrous, prominently and deeply 5-lobed both fresh and dry, light green and maturing dark red, 24–28 x 28–30 mm when fresh, 19–21 x 19–22 mm when dry; *pedicels* 5–7 mm long, 2.5 mm wide; pericarp 4 mm thick when fresh, sour. *Seeds* 5, arranged in a stellate pattern in cross section of the berry; obovoid, laterally compressed and biconvex, top rounded and notched near the hilum, base rounded; hilum side flattened; hilum linear, extending for nearly the entire length of the seed; opposite side keeled; 18 x 10 x 6 mm. Testa smooth, hard, glossy dark brown, *c.* 1 mm thick; endosperm distinct.

Etymology.—in reference to the star-shaped arrangement of the seeds in cross-sectioned berries (Fig. 1, j)

Vernacular.—(Thai) saming dao (saming: a mythical tiger-human spirit of the forest; dao: star, in reference to the cross-sectioned fruit)—an allusion indicating the importance of coexistence of spirits and trees in the forest; (English) gibbon's star fruit.

Phenology.—Deciduous in February, new leaves developing March–April. Flowers in late March to early April; fruit ripens in late August.

Ecology.—The habitat is primary, broad-leaved, seasonal evergreen forest on sandstone bedrock. The tree is rare and widely scattered; only 4 trees > 10 cm diameter occur on the 30-ha plot, which spans 740–810 m in elevation above sea level, giving a density of only 1 tree per 7.5 ha. The relative density on the plot is 1 tree per 4500 trees of all species. A tree with very immature fruit was also observed 11 June 2002 at 675 m elevation at Pa Gluay Mai (Orchid) Falls, Khao Yai Park. The fruit is consumed by gibbons (*Hylobates lar*) and intact seeds have been collected from their feces.

***Homalium cochinchinense* (Lour.) Druce (Flacourtiaceae), New Thai Record**

This species was described by Loureiro in 1790 as *Astranthus cochinchinense* Lour. from material he collected in South Vietnam. It was recombined by Druce as *Homalium cochinchinense* (Lour.) Druce in 1917. The revision of Flacourtiaceae for Thailand by Sleumer (1985) does not include the species. LESCOT (1970) provides an excellent description of this species which was formerly known only from Vietnam. Specimens in flower have now been collected from the forest dynamics plot at the Mo Singto area of Khao Yai National Park, Muang District, Nakhon Nayok Province, Central Thailand at 810 m elevation in seasonal evergreen forest. Only 3 trees of this species have been found of the 30-ha plot, the largest about 20 m tall and with dbh of 25 cm. This species is deciduous and has thin, smooth, grayish-brown bark (Figs. 9–10) and is slightly flanged or buttressed in the basal 50 cm. The inflorescences (Fig. 11) are narrow, spike-like panicles with pale green sepals and white petals.

The distinguishing features of this species are based mostly on flower morphology. The petals are obovate, narrowly clawed, with ciliate margins, and about 4 mm long. The stamens are solitary opposite each petal and the filaments are ciliate in the lower half. The slender, filiform styles are exerted from the flowers.

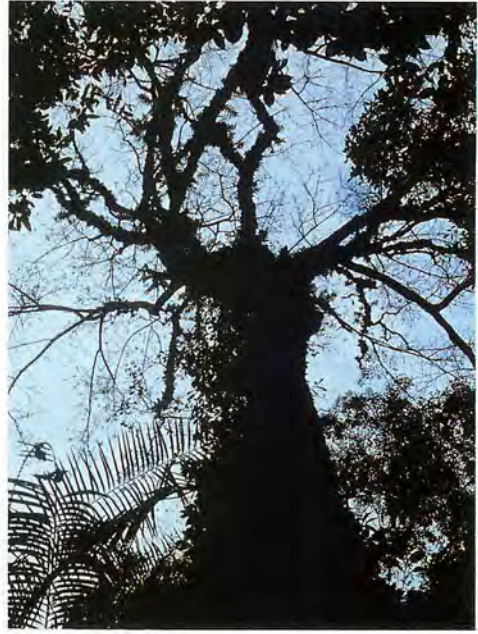
Specimens: P. CharoENCHAI 994, flowers, 23 May 2000; A. BoonKONGCHART 132, from same tree, flowers, 16 June 2000; both specimens in A, BKF, CAS, CMU, L, and Mahidol University–Salaya; Maxwell 02-201, north side of Khao Khieo (mountain), 1075 (–1175) m, flowers, 12 July 2002, tree 6–10 m tall, dbh 8–18 cm.

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Figure 1. Morphology of flowers, fruits, seeds, and leaves of *Pouteria stellibacca* Maxw., *sp. nov.* a, branchlet with flowers and mature-sized leaves; b, fascicles of flowers on a twig; c, flower bud; d, opening flower; e, sepal; f, opened corolla showing ovary, stigma, style, stamens, and staminodes; g, ovary in horizontal section; h, ovary in vertical section; i, whole fruit; j, fruit in horizontal section showing seeds; k, seed, lateral view. (Figures a-h from P. Charoenchai 1024; i-k from W. Y. Brockelman 60.) Figure drawn by O. Petmitr.



Figures 2, 3. Base and deciduous crown of *Pouteria stellibacca* south of Mo Singto plot, 27 February 2001. (Same tree as W. Y. Brockelman 60.)



Figures 4, 5. Base and crown with new leaves of *Pouteria stellibacca* tree in Khlong Sai area of Khao Yai Park on 21 March 2001. (Same tree as P. CharoENCHAI 1024, etc.) Photos in Figures 2-5 by W. Y. Brockelman.



Figures 6, 7. Close-up of a buttress of *Pouteria stellibacca* and cut bark and outer wood, showing thin milky sap, 27 February 2001 (Same tree as W. Y. Brockelman 60).



Figure 8. Fruit and seeds of *Pouteria stellibacca* south of Mo Singto plot, 27 August 1998 (Same tree as W. Y. Brockelman 60). Photos in Figures 6-8 by W. Y. Brockelman.



Figures 9, 10. Base of trunk and cut outer wood of *Homalium cochinchinense* (Same tree as P. CharoENCHAI 994). (Photos by W. Y. Brockelman.)



Figure 11. Flowers of *Homalium cochinchinense* tree (P. CharoENCHAI 994). Photo by P. CharoENCHAI, 23 May 2000.

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