

DYSOXYLUM QUADRANGULATUM, AND NOTES ON MELIACEAE IN SULAWESI

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SUMMARY

Dysoxylum quadrangulatum Culmsee (Meliaceae) is described as a new species from Sulawesi. *Dysoxylum acutangulum* Miq. subsp. *foveolatum* (Radlk.) Mabb. is reported as a new record for Sulawesi, closing the distribution gap between the two Western and Eastern Malesian distributed subspecies.

Key words: *Dysoxylum*, Meliaceae, Celebes, Sulawesi, Indonesia.

INTRODUCTION

The largest genus of the family Meliaceae, *Aglaiia* Lour., is centred on Malesia, with most of the remaining species in the Malesian region belonging to the closely related genera *Dysoxylum* Blume and *Chisocheton* Blume (Mabberley et al. 1995). According to the Flora Malesiana revision (Mabberley et al. 1995) and the Tree Flora of Sabah and Sarawak (Mabberley & Pannell 2007), there are 21 species of *Aglaiia* in Sulawesi (out of 94 described for the Malesian region), *Dysoxylum* with nine species (out of 50), and *Chisocheton* with seven species (out of 49) including *Chisocheton warburgii* Harms and *Chisocheton celebica* Koord. endemic to Sulawesi.

Tree inventories in Lore Lindu National Park, Central Sulawesi, have now revealed the existence of a new species, *Dysoxylum quadrangulatum*, and new distribution records for Meliaceae in Sulawesi or Central Sulawesi (based on old province assignments, Keßler et al. 2002).

***Dysoxylum quadrangulatum* Culmsee, spec. nov. — Fig. 1**

A sectionis *Cyrtochitonis* speciebus ceteris foliis alternatis glabris ad subglabris 5–12-jugatis, foliolis anguste oblongis acuminatis 10–27 cm longis ad 2.4 cm latis differt.
— Typus: *Culmsee HC_606* (holo L., in flower), Central Celebes, Lore Lindu National Park, Pono Valley (Toru), S 01°29.6', E 120°03.4' (GC-WGS 84), 1050 m alt., 18 Aug. 2006.

Primary forest understorey tree to 8.5 m, bole to 6.5 cm diam., sparsely and laxly branching. Bark fawnish yellow to brownish mottled, irregularly lenticellate; inner bark yellow; sap wood fawnish pale yellow. Leafy twigs 7–9 mm diam., youngest parts bright green when fresh, dull light green in sicco, below green sparsely greyish lenticellate, drying striate, then greyish yellow lenticellate. Apical leaf buds stiletto-like

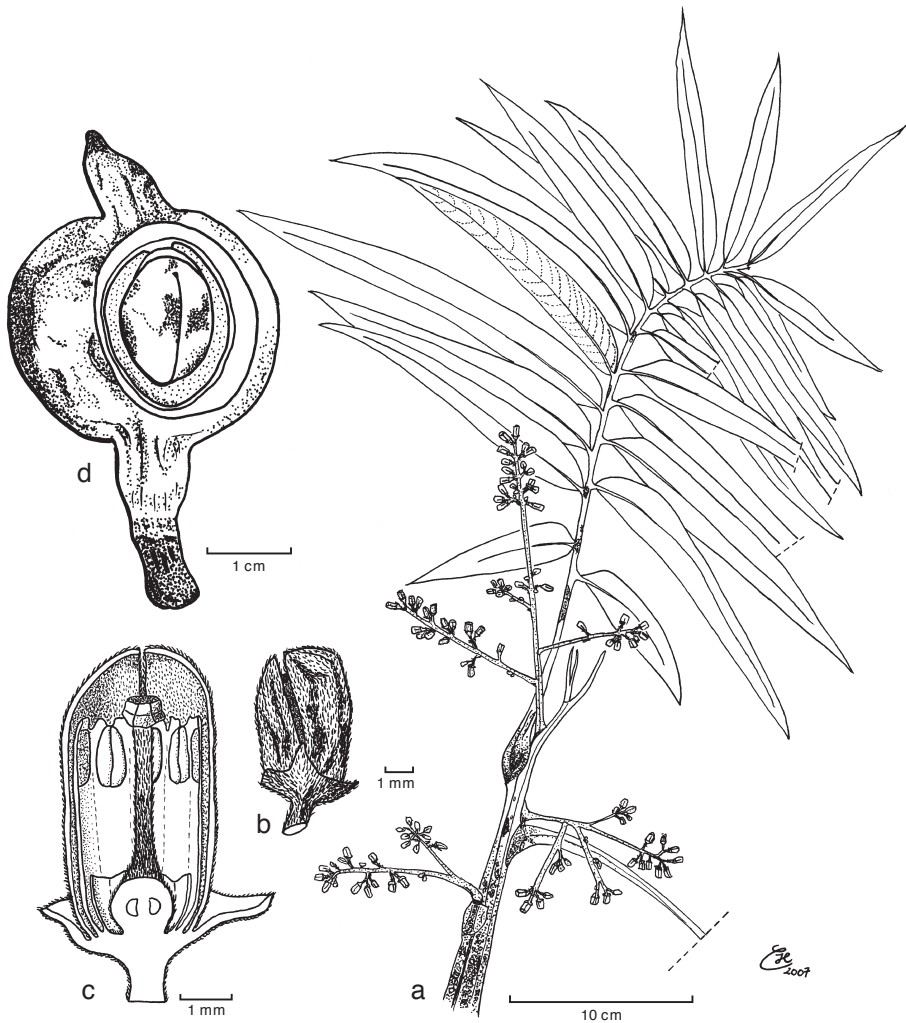


Fig. 1. *Dysoxylum quadrangulatum* Culmsee. a. Flowering shoot; b. flower; c. half-flower; d. fruit with opened valve and seed front view (a–c: Culmsee HC_606, type in L; d: Culmsee HC_747, GOET).

(sect. *Cyrtochiton*). Leaves 23–52 cm long, arranged in terminal spirals, the subdistal leaves being the longest, \pm alternately pinnate with a minute apical spike or its scar next to the terminal leaflet, sometimes subopposite distally and then an uneven number of leaflets possible; glabrous, rarely some scattered minute hairs on the leaf rachis and petiolules, bright green shiny when fresh, drying dull yellowish green, 5–12-jugate; petiole 7–11.5 cm, irregularly lenticellate, swollen basally. Leaflets 10–27 by 1.3–2.4 cm, the subdistal leaflets being the longest, \pm linear, basally \pm markedly asymmetric, apices long acuminate; brittle when dried; costae distinct, primary leaf-vein pattern \pm obscure, adaxially slightly sunken, 15–25 arching veins on each side. Inflorescences

axillary, panicles 10–17 cm, up to 4 branches, basal branches spreading, up to 10 cm; axis and branches angulate, densely covered with minute appressed yellowish white hairs; bracteoles triangular, pubescent. *Flowers* 4-merous, appearing quadrangular. *Calyx* c. 1.5 mm long, c. 4 mm diam., 4-lobed to about half way, outside densely covered with minute appressed setaceous hairs, inside glabrous, continuous with pseudopedicel about 1 mm. *Petals* 4, free, oblong, c. 5 mm long, c. 2 mm wide, outwards densely whitish yellow appressed pubescent, inwards reddish brown setaceous-papillate. *Staminal tube* straight and nearly as broad as corolla, c. 4 mm long, c. 2.5 mm wide, outwards densely whitish tomentose, inwards glabrous, magenta-black, margin 8-lobed, the lobes irregularly lacinate; anthers 8, c. 1 mm long, inserted between the lobes. *Disk* c. 1.5–2 mm wide, c. 1 mm high, cup-shaped, complanately acutely lobed, glabrous, interior base densely covered with appressed yellow hairs. *Ovary* densely upward appressed yellowish setaceous, (3- or) 4-locular, each locule 1-ovulate; style \pm quadrangular, setaceous up to stylehead, but becoming more sparsely in proximal 1/2; stylehead c. 1 mm broad, dark brown, quadrangular capitate. *Infructescence* in leaf axil, solitary to branched. *Capsule* 3–4.5 cm diam., subglobose, distinctly angled between the (3 or) 4 valves, bright green, sometimes irregularly and sparsely yellowish brown lenticellate, drying light-brown; with distinct apex, c. 1 cm long, which is apically hairy with sparsely appressed hairs; basally distinctly stipitate, 1–1.5 cm. *Seeds* (3 or) 4, c. 1.5 cm long, 1 cm wide, plano-convex, seedcoat light orange, circumhilar whitish orange aril, dorsally covering seed to 1/3 (c. 5 mm), on front side to 1 mm.

Distribution — Known from one locality in Lore Lindu National Park, Central Celebes (see details above).

Habitat — Submontane primary wet forest (1050 m altitude) on Ferralsol (FAO 2006) developed on metamorphic rocks in stable level terrain on a mid-slope. Most important families (FIV, Mori et al. 1983) in trees of diameter breast height (dbh) \geq 10 cm are Lauraceae, Fagaceae, Sapotaceae, Euphorbiaceae, and Burseraceae.

Name — The species epithet refers to the quadrangular aspect of the floral parts.

Notes — 1. Tree architecture is corresponding to the Champagnat's Model (Hallé et al. 1978: 238 ff.), i.e. growth form is determined by superposition of mixed orthotropic axes with spiral phyllotaxis, each relay axis becoming pendulous distally by its own weight, the renewal shoot then arising on the upper surface in the initial curve of the pendulous axis.

2. In the key (Mabberley et al. 1995: 63–66) the species keys out as follows:

- | | |
|---|----------------------------|
| 1a. Leaf rachis conspicuously winged. — New Guinea | 6. <i>D. alatum</i> |
| b. Leaf rachis unwinged, rarely weakly so | 2 |
| 2a. Leaves opposite | 3 |
| b. Leaves spirally arranged | 5 |
| 5a. Terminal leaflet present | 6 |
| b. Terminal leaflet absent; small 'spike' or scar \pm present | 17 |
| 17a. Apical bud not spike-like, with young leaves like clenched fists | 18 |
| b. Apical bud spike-like or stiletto-shaped (sect. <i>Cyrtochiton</i>) | 33 |
| 33a. Abaxial surface of leaflets brown-tomentose | 34 |
| b. Abaxial surface of leaflets glabrous to subglabrous | 35 |

- 35a. Leaves 5–12-jugate, leaflets narrowly oblong acuminate, 10–27 cm long and up to 2.4 cm wide **D. quadrangulatum**
 b. Leaves (1–)2–5(–6)-jugate, leaflets oblong-ovate, obovate-oblong, elliptic-ovate or oblong-lanceolate, wider than 2.5 cm continue with 35 in original key

Additional specimens:

Culmsee HC_743 (L, in fruit), *Culmsee HC_747* (GOET, in fruit), *Culmsee HC_3211* (GOET).

NOTES ON MELIACEAE IN SULAWESI

In the habitat of the submontane primary wet forest described above, considering trees of dbh ≥ 2 cm, after the Euphorbiaceae and Lauraceae (each 12 species), the Meliaceae are the second most species-rich family, comprising 11 species:

Aglaia lancilimba Merr.

Aglaia sp.

Aglaia squamulosa King

Aglaia tomentosa Teijsm. & Binn.

Chisocheton patens Blume

Chisocheton warburgii Harms

Dysoxylum acutangulum Miq. subsp. *foveolatum* (Radlk.) Mabb.

Dysoxylum densiflorum Miq.

Dysoxylum excelsum Blume

Dysoxylum nutans (Blume) Miq.

Dysoxylum quadrangulatum Culmsee

Dysoxylum acutangulum Miq. is a new record for Sulawesi (Mabberley 1994, Mabberley et al. 1995, Keßler et al. 2002). The species has two subspecies, *D. acutangulum* subsp. *acutangulum*, in Malesia confined to Sumatra, the Malay Peninsula, Borneo and the Philippines and *D. acutangulum* subsp. *foveolatum*, which is restricted to S and W Sumatra, W Java, the Lesser Sunda Islands, the Moluccas, and New Guinea (Mabberley et al. 1995). The collections of *Dysoxylum acutangulum* subsp. *foveolatum* (*Culmsee HC_222*, GOET, *Culmsee HC_307*, L) close the distribution gap in favour of the more Eastern Wallacean distributed subspecies. The specimens have 5–7 narrowly elliptic leaflets on each side of the midrib; small domatia are only sporadically present.

Aglaia lancilimba and *Chisocheton patens* are new records for Central Sulawesi province according to Keßler et al. (2002). *Chisocheton warburgii* is mentioned with only one collection (*De Vogel 2642*, L) from North Sulawesi in Keßler et al. (2002), but is distributed in Central and North Celebes according to Mabberley et al. (1995). Since the plant is known from only four extant collections, the collection *Culmsee HC_245a* (L, CEB, GOET) is remarkable. The specimens have an infructescence that is drooping to 65 cm with up to 11, densely pubescent, capsules.

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REFERENCES

- FAO. 2006. World reference base for soil resources 2006. A framework for international classification, correlation and communication. World Soil Resources Reports 103: 1–128.
- Hallé, F., R.A.A. Oldeman & P.B. Tomlinson. 1978. Tropical trees and forests. An architectural analysis. Springer Verlag, Berlin.
- Keßler, P.J.A., M.M. Bos, S.E.C. Sierra Daza, A. Kop, L.P.M. Willemse, R. Pitopang & S.R. Gradstein. 2002. Checklist of woody plants of Sulawesi, Indonesia. Blumea, Suppl. 14: 1–160.
- Mabberley, D.J. 1994. New species of *Dysoxylum* (Meliaceae). Blumea 38: 303–312.
- Mabberley, D.J. & C.M. Pannell. 2007. Meliaceae. In: E. Soepadmo, L.G. Saw, R.C.K. Chung & R. Kiew (eds.), Tree Flora of Sabah and Sarawak 6: 17–218. Forest Research Institute Malaysia, Kuala Lumpur.
- Mabberley, D.J., C.M. Pannell & A.M. Sing. 1995. Meliaceae. Flora Malesiana, Ser. I, 12: 1–407.
- Mori, S.A., B.M. Boom, A.M. de Carvalho & T.S. dos Santos. 1983. Southern Bahian moist forests. The Botanical Review 49: 155–232.