

DYSOXYLUM MIDDLETONIANUM
(*MELIACEAE*), A DISTINCTIVE NEW SPECIES
FROM THE SOUTHERN FOLD MOUNTAINS OF
PAPUA NEW GUINEA

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Dysoxylum middletonianum Takeuchi (*Meliaceae*) is described from previously unexplored habitats in the Southern Fold Mountains of Papua New Guinea. The new plant is the smallest *Dysoxylum* in eastern Malesia and one of only two species with whip infructescences.

Keywords. *Dysoxylum*, *Meliaceae*, Papua New Guinea.

INTRODUCTION

Dysoxylum Blume (*Meliaceae*) is the second largest genus (exceeded only by *Aglaia* Lour.) in one of Papuasias's dominant lowland families. The most recent taxonomic summary (Mabberley, 1995) treats 28 *Dysoxylum* species for New Guinea and its satellite islands, within a total regional conspectus of 47 species.

Owing to its economic importance in the timber industry, *Dysoxylum* was an early focus of attention by forestry collectors, to such an extent that no new species have been found in New Guinea since the territorial period (Mabberley, 1994). Contemporary botanical exploration suggests that arborescent *Dysoxylum* have probably received a near-complete accounting, and future revision will be arguably confined to nomenclatural fine-tuning. Although this appraisal may seem overly optimistic, such is the view from the field, where new records from the upper canopy have proven increasingly difficult to obtain. Of the four most recently described species in New Guinea *Dysoxylum*, only *D. annae* Mabb. is arborescent.

Exploratory surveys in Papuasias have accelerated in frequency and intensity within the last decade, driven primarily by Conservation International's Rapid Assessment Program (RAP) of biological reconnaissance. Since the initial launch of RAP in 1994, a consistent pattern in the assessments has been the pronounced paucity of new discoveries from the forest canopy (compared with other forest strata). Despite the deployment of effective tree-climbing teams on RAP surveys, an overwhelming proportion of new taxa is being found among understorey, vining,

or epiphytic plants – not the arborescent ones. The apparent asymptote in phanerophyte discovery is testimony to the accomplishments of earlier, forestry-focused surveyors, and of the finite limits in floristic diversity even in speciose environments.

Within woody families such as *Meliaceae*, where a wide range of differently sized species is represented, local neo-endemism is apparently skewed towards the small-statured forms, since that is where RAP discoveries are concentrated. In the following account, one of the smallest known species of *Dysoxylum* is described from a congeneric assemblage composed primarily of timber trees.

DESCRIPTION

Dysoxylum middletonianum Takeuchi, *sp. nov.* Figs 1, 2.

A Dysoxylum phaeotricho Harms foliis 7–8-jugatis, tubis staminalibus valde 8-lobulis, discus glaber differt. – Type: Papua New Guinea, Southern Highlands Province, South Karius, 1430 m, 9 ii 2008, *Takeuchi, Gambia & Jisaka* 22697 (holo LAE; iso A, L).

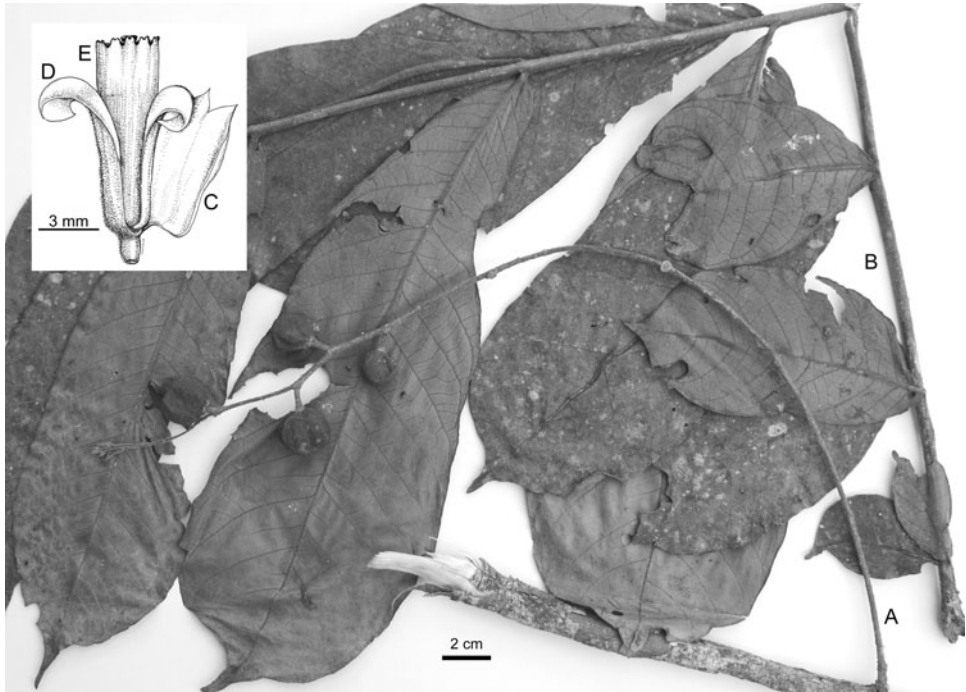


FIG. 1. *Dysoxylum middletonianum* Takeuchi. Unmounted sheet from the type collection. A, fruiting raceme; B, basal leaf section with apical blades removed. Inset, upper left – illustration of anthetic flower: C, calyx, tube sectioned and turned aside; D, petal; E, staminal column (*Takeuchi et al.* 22697).

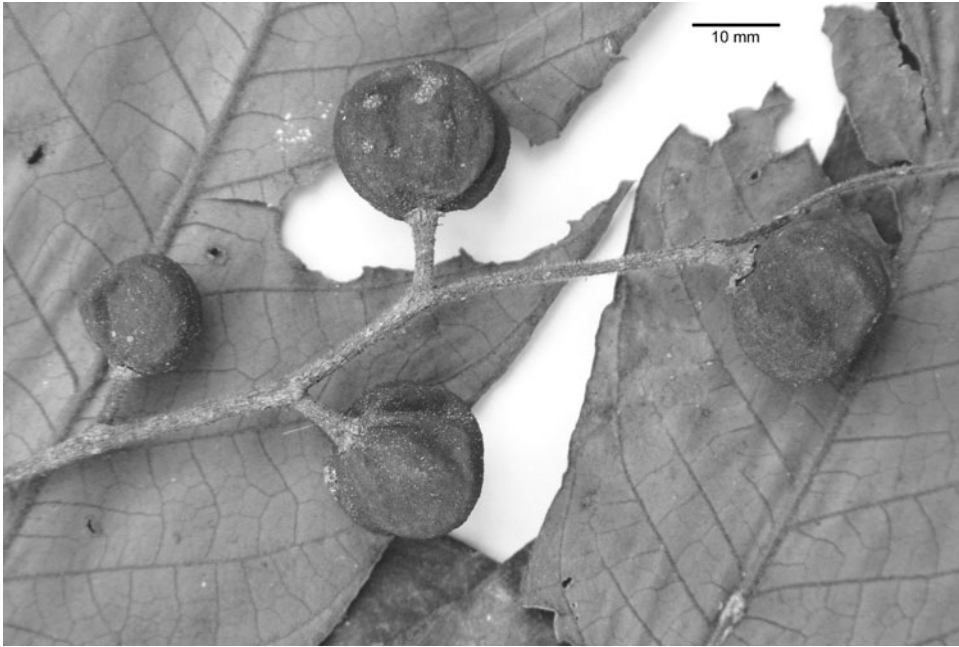


FIG. 2. *Dysoxylum middletonianum*. Fruit detail. The capsules are light pink *in vivo* but dark reddish-brown after drying (Takeuchi *et al.* 22697).

Terrestrial undershrubs, 1.5 m tall. *Branchlets* terete, 3–5 mm diameter at the first nodes, nigrescent, lenticellate, pithy or hollow; apical bud foliaceous (not subulate); indumentum densely hirtellous, acicular, persisting, hyaline brown; periderm crustaceous, decorticating in irregular flakes, pallescent; internodes 1.5–4.5 cm. *Leaves* paripinnate with a terminal scar (or imparipinnate), 7–8-jugate, velutinous on all parts, spiral, lax, exstipulate, epunctate under transmitted light; petioles cylindrical, 2.8–10 cm long, 3–6 mm diameter, base 6–11 mm wide, not sulcate; rachis terete, (17–)50–64 cm long, 2–5.5 mm diameter, straight or nearly so; lateral petiolules (2–)3–5 mm long, 1.5–2.5 mm diameter, terminal petiolule (when present) 5–12 mm long, 1.5 mm diameter; leaflets papery, frangible, varying in size and shape: lowermost ones reduced, suborbicular to broadly elliptic, 4.8–11.5 × 3.1–5.7 cm, uppermost blades largest, oblanceolate, 21–29.1 × 8–10.4 cm, other leaflets transitional; base usually oblique, margin entire, apex abruptly acuminate or up to 2.5 cm cuspidate; surfaces opaque, adaxially fuliginous, abaxially brown or somewhat fulvous; hairs late-falling, their bases persisting as a pusticulate residue; venation reticulate-brochidodrome (rarely camptodrome), lateral veins 5–7 per side on proximal leaflets, 16–24 per side on distal leaflets, (4–)9–22 mm apart, at the lamina centre diverging 50–70° from midribs, abruptly turned c.1–3 mm before the margin, closing by periclinally looping nerves (or not); tertiary veins subscalariform, reticulum discolorous, conspicuous, irregular, coarsely areolate; midribs prominent

on both sides, higher-order nervation planate or weakly raised. *Inflorescence* axillary from foliate nodes, racemose, 10.5–28.7 × 0.5–1.5 cm, solitary, pendulous, axes velutinous; peduncle 9.5–12 cm long, 1–2 mm diameter, cylindrical; rachis 1–16.7 cm long, 0.8–1 mm diameter; rachis bracts foliaceous, elliptic, to 6.5 mm long, entire, antrorse, persisting. *Flowers* (rehydrated measurements) inserted singly on rachises, ebracteolate; pedicels 3–4.5 mm long, 1–1.5 mm diameter, articulate; calyx synsepalous, tubiform, c.11 × 5 mm, externally hirtellous, internally glabrous, cleft 1.5–6 mm from the top, lobules 4, triangular, erect, unequal; corolla valvate, petals distinct, 4, lorate, 15–16 × 2.5–3 mm, reflexed, distally sericeous on the outside, otherwise glabrous; staminal tube cylindrical, c.14 × 3 mm, glabrous, ± fleshy, conspicuously 8-lobate at the summit, lobes equal, rectangular, c.3 × 1 mm, apically notched; anthers 8, included, attached to sinuses, muticous, oblong, 1.2–1.3 × 0.8–0.9 mm; disk cylindrical, c.2.5 × 1.7 mm, bifacially glabrous, margin erulose; ovary globuliform, strigulose; style columnar, c.13 × 0.8 mm, pilose on the lower 1/3–1/2, minutely papillate above, style-head collariform, c.0.8 × 1.3 mm. *Infructescence* below the leaves, flagelliform, 20–43.5 × 3–5.5 cm, pendulous, ebracteate, velutinous on all axial surfaces, lenticellate; fruiting pedicels 6–9 × 1.8–2.5 mm, cylindrical, furrowed. *Capsules* subglobose, 14–17 × 17–19 mm, estipitate, recessed at the top or not, loculicidal, 4-celled, laxly strigulose, glabrescent, mature exocarp reddish-brown pulverulent; seeds black.

Field notes. Monoaxial undershrubs, branchlets myrmecophilous, no exudate; leaflets papery, bifacially dull green; corolla off-white; fruits subglobose, pink.

Distribution. Known only from the type locality (Fig. 3).

Habitat. Shady understoreys in mossy montane forest, 1430 m elevation.

Phenology. Flowering and fruiting in early February.

Etymology. The epithet recognises the collective contributions of David J. Middleton to the Flora Malesiana.

Notes

- 1 *Dysoxylum middletonianum* has a whip inflorescence/infructescence recalling *D. phaeotrichum* Harms, the only other Papuan congener of comparable aspect. Table 1 summarises the distinctions between the two species.
- 2 The new plant resembles precocious individuals of *Aphanamixis polystachya* (Wall.) R.N.Parker, for which it might be confused in the field. Although the flagelliform racemes and myrmecophilous habit are obvious points of similarity, floral structures easily reveal the correct identities: corollas are tetramerous in *Dysoxylum middletonianum* (not trimerous as for *Aphanamixis*), and the staminal tube is cylindrical (not cupuliform). The type collection for *Dysoxylum middletonianum* includes anthetic flowers and mature fruits, allowing for decisive generic assignment despite the superficial similarities to *Aphanamixis*.

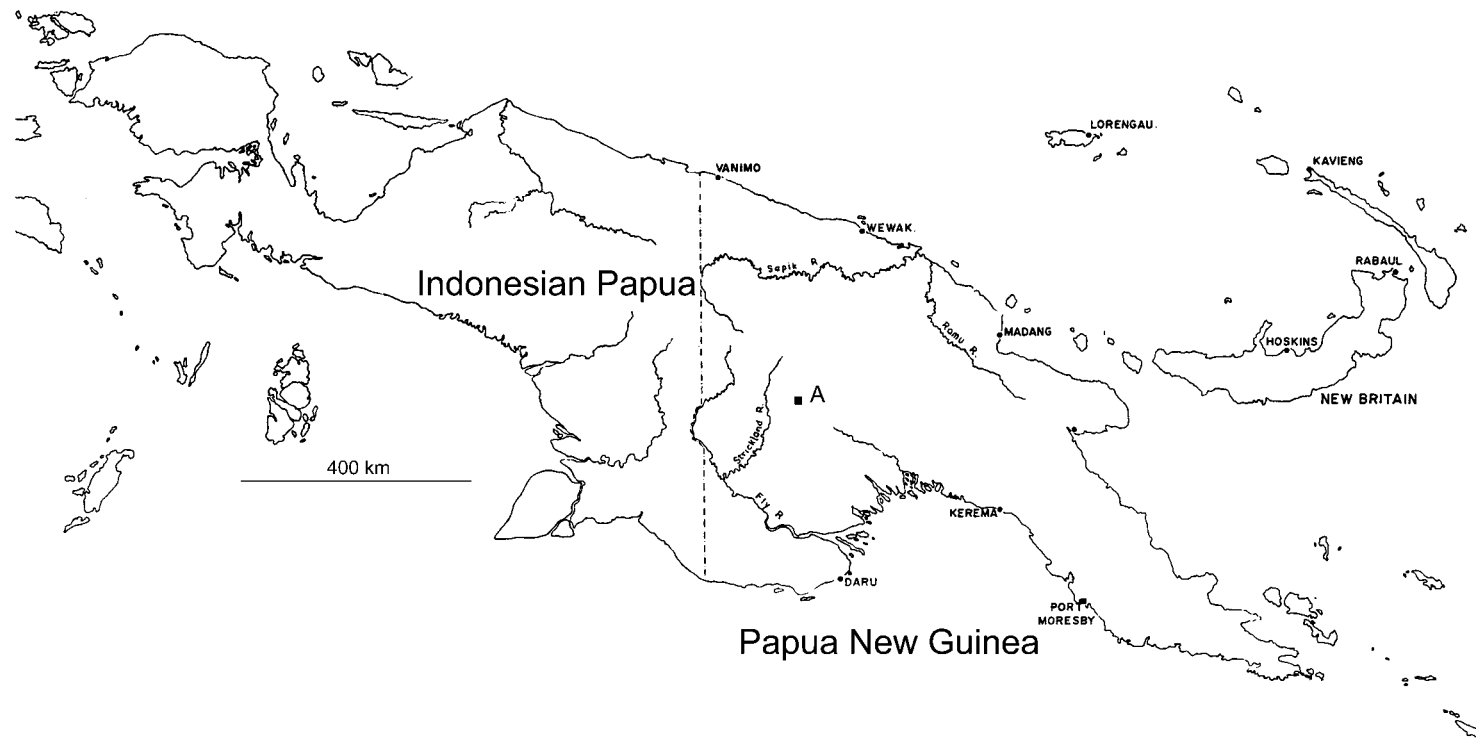


FIG. 3. Island of New Guinea. A, Karius Range, type locality for *Dysoxylum middletonianum*.

TABLE 1. Summary of differentiating characters for *Dysoxylum middletonianum* and *D. phaeotrichum*

<i>Dysoxylum middletonianum</i>	<i>Dysoxylum phaeotrichum</i>
Monocaulous shrubs c.1.5 m tall	Sparsely branched treelets 2–8 m tall
Leaves 7–8-jugate with an apical scar (or imparipinnate); leaflets chartaceous, bifacially velutinous; reticulum manifest	Leaves 5–6-jugate with an apical scar; leaflets coriaceous, adaxially glabrous, abaxially sericeous; reticulum obscure
Inflorescence racemose, 10.5–28.7 × 0.5–1.5 cm, velutinous; bracts elliptic, to 6.5 mm	Inflorescence paniculiform, to 58 cm long with primary branches to 25 cm long; appressed or subappressedly hairy; bracts subulate, 5–18 mm
Flowers inserted singly on rachises, alternate, ebracteolate; staminal tube deeply lobed at the top; disk bifacially glabrous	Flowers 1–3 in subopposed cymes, bracteolate; staminal tube entire or repand at the top; disk bifacially hairy
Infructescence to 43.5 cm long, velutinous, ebracteate; fruiting pedicels 6–9 mm long	Infructescence to 63 cm long, striguliform-hairy, bracteate; fruiting pedicels 3–4 mm long
Capsules 14–17 × 17–19 mm, estipitate, exocarp reddish-brown pulverulent	Capsules 15–30 mm or more in diameter, stipitate, exocarp black

3 *Dysoxylum middletonianum* will key directly to *D. phaeotrichum* (couplet 31a in Mabberley, 1995: 65). It can then be identified using the numerous character contrasts listed in Table 1, or alternatively, the two species can be separated with the following simplified couplet:

1. Leaves 5–6-jugate with an apical scar, reticulum obscure; flowers 1–3 in subopposed cymes, bracteolate, staminal tube entire or repand; fruiting pedicels 3–4 mm long, capsules stipitate, exocarp sparsely sericeous, drying black _____ *Dysoxylum phaeotrichum*
1. Leaves 7–8-jugate with an apical scar (or imparipinnate), reticulum conspicuous; flowers inserted singly on rachises, ebracteolate, staminal tube deeply lobed; fruiting pedicels 6–9 mm long, capsules estipitate, exocarp densely mealy-farinose, drying reddish-brown _____ *Dysoxylum middletonianum*

4 *Dysoxylum phaeotrichum* has been recorded from a number of localities in Papua and Papua New Guinea, at elevations up to 700 m (Harms, 1942; Mabberley, 1995; Takeuchi & Kulang, 1998). Judging from its occurrence in mossy forest at 1430 m, *Dysoxylum middletonianum* is probably a derived montane counterpart to the more common congener in the lowlands.

The new species is the smallest *Dysoxylum* in New Guinea, occurring as elegant monocauls c.1.5 m tall. Among the described congeners in eastern Malesia, only *Dysoxylum boridianum* Mabb. is of comparably diminutive stature. This latter species has been characterised as a montane sister species to *Dysoxylum sparsiflorum*

Mabb. of lowland environments (Mabberley, 1995: 101), a relationship analogous to the presumed connection between *D. middletonianum* and *D. phaeotrichum*.

Dysoxylum boridianum, *D. middletonianum* and *D. phaeotrichum* are three of the four most recently described *Dysoxylum* in the eastern region. All of these taxa are also among the smallest *Dysoxylum* in Papuasias, a circumstance consistent with emerging patterns of RAP discovery in woody genera.

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