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NOTES ON TAXONOMY AND POLLEN OF MALESIAN DAPHNIPHYLLUM (DAPHNIPHYLLACEAE)

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SUMMARY

This paper is a precursor to the revision of the family Daphniphyllaceae in Flora Malesiana, in which 16 species of the genus *Daphniphyllum* will be treated. In the present paper a description is given of one new variety, *D. gracile* Gage var. *newirelandum*, and five new combinations have been made, *D. ceramense*, *D. dichotomum*, *D. papuanum* Hallier f. var. *tuberculatum*, *D. sumatraense*, and *D. timorianum*. An enumeration of the 16 species as will be treated in Flora Malesiana is given here; the numbering of the new variety and the five new combinations in the present paper is the same as will be used in Flora Malesiana. A key to sections, subsections and series is given. Pollen features, a distribution map of the two sections, and a line drawing of the new variety are provided.

INTRODUCTION

Forming a monotypic family, Daphniphyllaceae, the genus *Daphniphyllum* consists of about 30 species, with 16 of them in the Malesian region. The species are distributed from India to Japan and from Central China to New Guinea (Fig. 1). They grow on hillsides, burnt areas, grasslands or montane forests at altitudes of 300–4000 m.

Monographic study of *Daphniphyllum* was initiated by Müller Argoviensis (1869), and followed by Rosenthal (1919) and by T.C. Huang (1965, 1966). Six species were reported from the Malesian region in my treatment (Huang, 1966); three sections were also proposed: section *Daphniphyllum* [including *D. glaucescens* Blume, *D. gracile* Gage, *D. philippinense* Huang and *D. woodsonianum* Huang], section *Lunata* Huang [including *D. laurinum* (Benth.) Baill.], and section *Staminodia* Hurusawa [including *D. parvifolium* Quisumb. & Merr.]. Since then, no revision nor monographic treatment has been done for the Malesian region.

Morphological features used alone cannot be expected to reach the ideal classification of the genus *Daphniphyllum*. I accept more of the older specific names for this paper than in my previous work. More field and experimental work is needed before better taxonomic results can be obtained, because these plants possess simple features and regional variation among the islands. Therefore, the following taxonomic treatment is still a provisional one.

Daphniphyllaceae have been placed in various orders (Huang, 1965, 1966). There are some recent treatments, such as in Pittosporales by Thorne (1976, 1983). Hutchinson (1973) and Takhtajan (1980) placed it in Hamamelidales. Dahlgren (1983) and Thorne (1992) considered the family as a member of Balanopales (Buxales). Sutton (1989) and Zhang & Lu (1989) placed it in Daphniphyllales with closest relationship to Hamamelidales as suggested by Huang (1965) and Cronquist (1983).

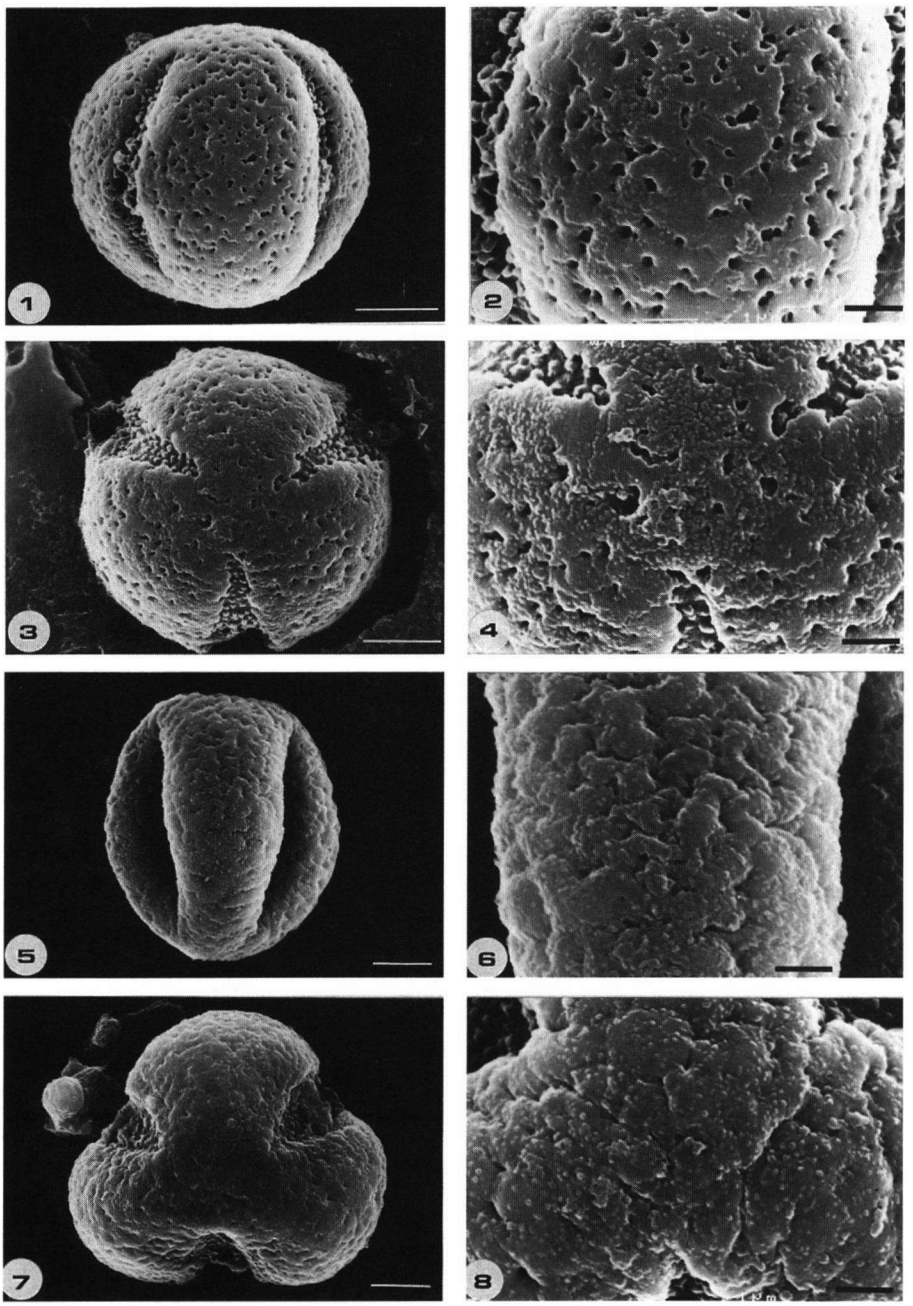
POLLEN MORPHOLOGY

The new data obtained from a scanning electron microscopic study show that pollen grains are stenopalynous, isopolar, 3(–4)-aperturate. Grain size is 11–18 µm. Grain shape is subprolate to suboblate (P/E = 1.21–0.85). The equatorial outline is circular to semi-circular. The aperture is colpate to colporoidate. Exine ornaments are irregularly perforate in section *Lunata* (*D. laurinum*) and fossulate in section *Daphniphyllum* (Table 1; Plates 1–3).

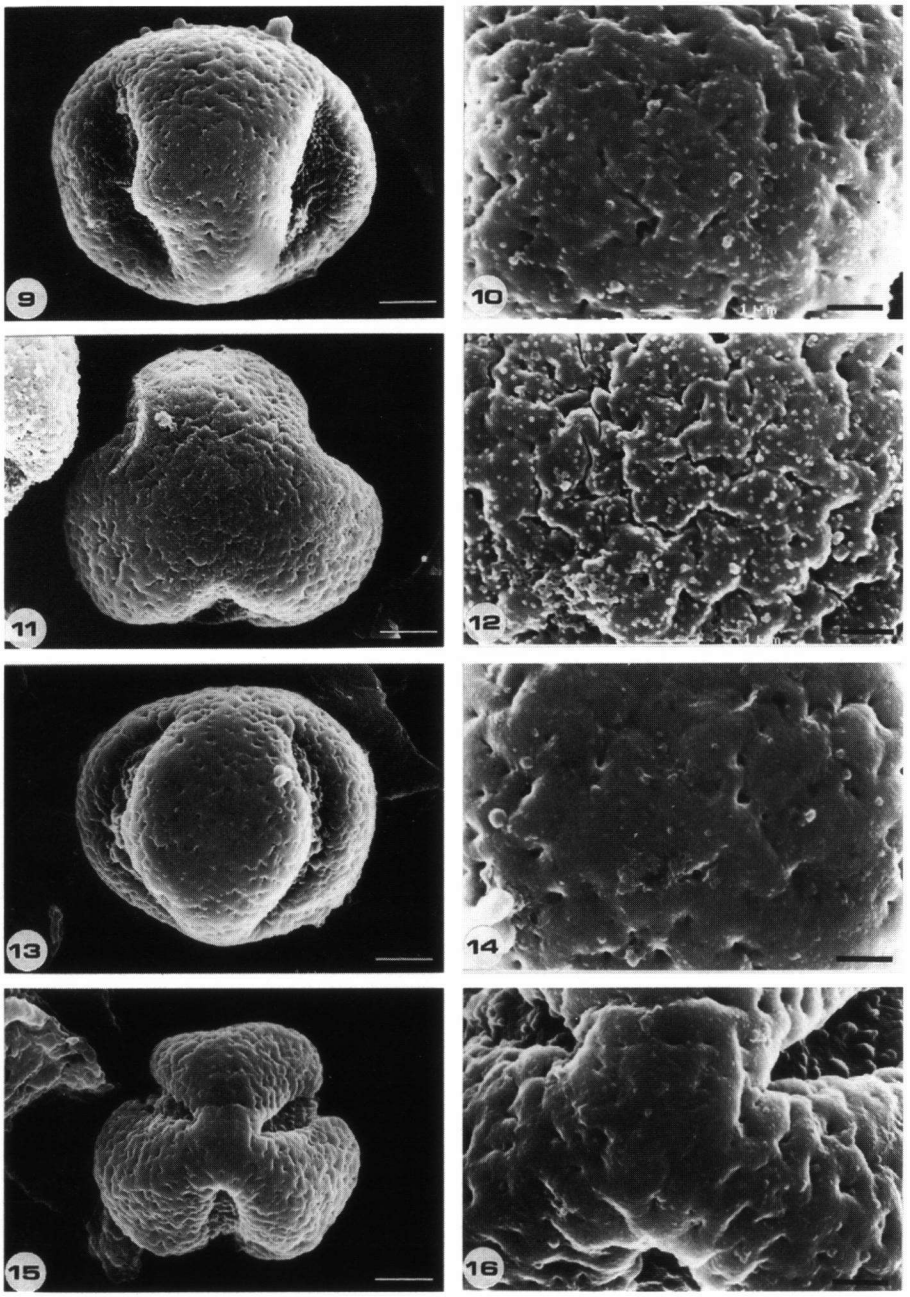
Table 1. Pollen data of *Daphniphyllum*.

Taxa	Ornaments	P/E	Amb (µm)	Vouchers
Section *Lunata*				
D. laurinum	irregularly perforate	11–12.5 / 11–11.5 prolate-sphaeroidal to oblate-sphaeroidal	11–12	*Soepadmo & Mahmud 1193* *Ding Hou 758* *Whitmore 3789*
Section *Daphniphyllum*				
D. borneensis	fossulate	13.5–15.4 / 15.8–16.2 suboblate to oblate-sphaeroidal	14–15	*Meijer 54275* *Haviland 1070*
D. gracile	fossulate	13.9–15.8 / 14.2–17.7 oblate-sphaeroidal to suboblate	17–18	*Kalkman 4994* *Frodin 26829* *Hartley 12748* *Stevens & Veldkamp 54230*
D. papuanum var. *tuberculatum*	fossulate	12.8–17.5 / 11.9–17.6 oblate-sphaeroidal to prolate-sphaeroidal	14–19	*Frodin 26291* *Jacobs 9414* *Flenley 2611* *Brass 31460*
D. timorianum	fossulate	12.9–14.8 / 12.2–14.5 subprolate to oblate-sphaeroidal	13–17	*Kostermans & Wirawan 484* *Metzner 253, 255* *Schmutz 3484*

Plates 1–3. Illustrations of pollen grains of *Daphniphyllum*. White scale bars = 3 µm; black scale bars = 1 µm, respectively. Photos 1, 5, 9, 13 and 17 are equatorial views; 2, 6, 14, 18 and 20 are polar views; 3, 7, 11, 15 and 19 are mesocolpium areas; 4, 8, 12, 16 and 20 are apocolpium areas. Photos 1–4 show irregularly perforate ornamentation and 5–20 show fossulate ornamentation. — 1–4: *Daphniphyllum laurinum* (Benth.) Baill. (*Soepadmo & Mahmud 1193*); 5–8: *D. papuanum* Hallier f. (*Frodin 2629*); 9–12: *D. gracile* Gage (*Kalkman 4994*); 13–16: *D. borneense* Stapf (*Meijer 54275*); 17–20: *D. timorianum* (T.C. Huang) T.C. Huang (*Metzner 253*).



For legends, see page 232.



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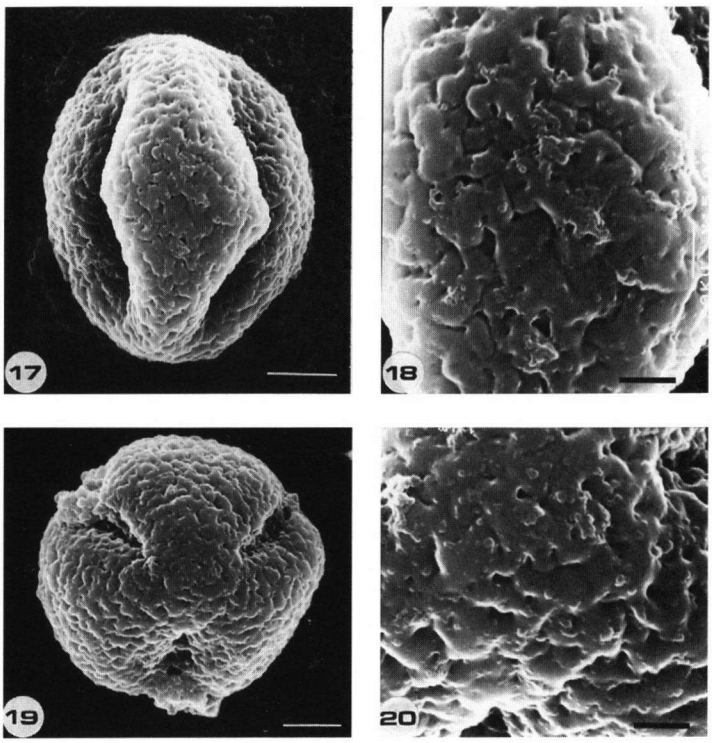

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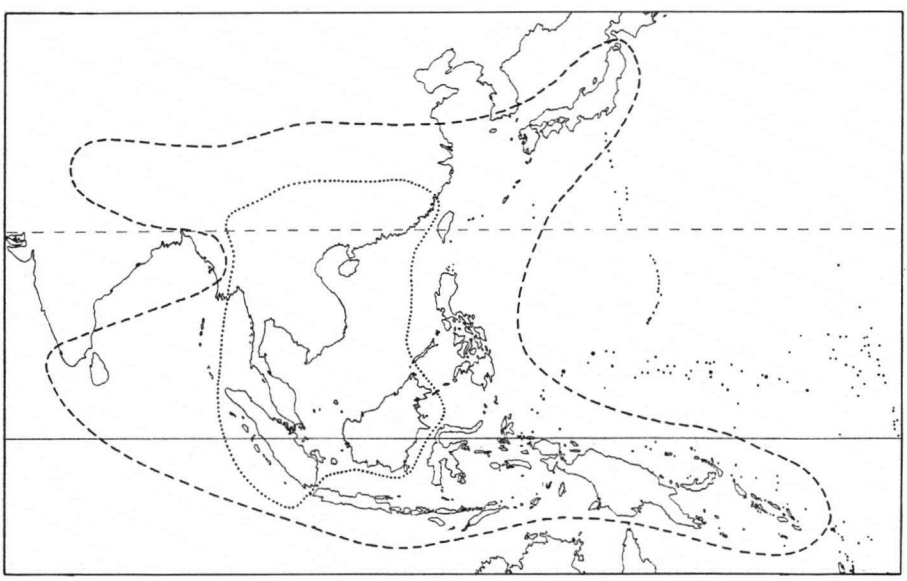

Fig. 1. Distribution map of *Daphniphyllum* section *Daphniphyllum* (– – – – –) and section *Lunata* (·····).

SYSTEMATIC TREATMENT (Table 2)

Key to sections, subsections and series

1a. Anthers usually oblong or elliptic, compressed or oblique, extrorse, completely free, with a usually long filament; calyx present, usually caducous, at least in pistillate flowers, or absent; drupes smooth to tuberculate, usually not glaucous; pollen larger than 12.7 by 12.7 µm; exine fossulate ..... **1. Section Daphniphyllum** 2

b. Anthers lunate, introrse, coherent at apex, subsessile; calyx persistent, at least in staminate flowers; drupes strongly tuberculate, usually distinctly glaucous; pollen grains smaller than 12.7 by 12.7 µm; exine irregularly perforate ..... **2. Section Lunata**

2a. Calyx 4–6-lobed; drupes from lustrous and smooth to verrucose or tuberculate; leaf blades usually papillate, chartaceous to coriaceous, all veins prominent and reticulate above ..... **1A. Subsection Daphniphyllum** 3

b. Calyx absent or rarely 1- or 2-lobed, linear, affixed to base of stamens; drupes usually tuberculate; blades usually epapillate, membranous to chartaceous, all veins obscure and delicate or impressed above ... **1B. Subsection Staminodia** (*D. parvifolium*)

3a. Calyx present in both staminate and pistillate flowers 4

b. Calyx present in pistillate flowers only ..... **1Ac. Series Unicalycifera** (*D. buchananiifolium, celebense, woodsonianum*)

4a. Calyx inarticulate, usually persistent in staminate flowers and shorter than the androecium and gynoecium ..... **1Aa. Series Daphniphyllum** (*D. borneense, ceramense, dichotomum, glaucescens, lancifolium, luzonense, scortechinii, sumatraense, timorianum*)

b. Calyx articulate, caducous and usually longer than the androecium and gynoecium ..... **1Ab. Series Longicalycifera** (*D. gracile, papuanum*)

Enumeration of Malesian species[1]

Daphniphyllum Blume, Bijdr. (1826) 1153.

1. *D. borneense* Stapf
2. *D. buchananiifolium* Hallier f.
3. *D. celebense* K. Rosenthal
4. *D.* ***ceramense*** (T.C. Huang) T.C. Huang
5. *D.* ***dichotomum*** (T.C.Huang) T.C.Huang
6. *D. glaucescens* Blume
   a. var. *glaucescens*
   b. *blumeanum* (Baill. ex Müll. Arg.) J. J. Sm.
7. *D. gracile* Gage
   a. var. *gracile*
   b. var. ***newirelandum*** T.C. Huang
8. *D. lancifolium* Hook. f.
9. *D. laurinum* (Benth.) Baill.
10. *D. luzonense* Elmer
11. *D. papuanum* Hallier f.
    a. var. *papuanum*
    b. var. ***tuberculatum*** (T.C. Huang) T.C. Huang
12. *D. parvifolium* Quisumb. & Merr.
13. *D. scortechinii* Hook. f.
14. *D.* ***sumatraense*** (T.C. Huang) T.C. Huang
15. *D.* ***timorianum*** (T.C. Huang) T.C. Huang
16. *D. woodsonianum* T.C. Huang

1) Species to be treated in Flora Malesiana; names printed in bold type have been treated in the present paper.

Table 2. Comparison of the Malesian taxa of *Daphniphyllum* accepted by me in the past (1965/66) and in the present treatment.

Section 1. Lunata Huang	**Section 2. Lunata** Huang
1. *D. laurinum* (Benth.) Baill.	9. *D. laurinum* (Benth.) Baill.
Section 2. Daphniphyllum Blume	**Section 1. Daphniphyllum** Blume
	Subsection 1. Daphniphyllum
Subsection 1. Longicalycifera Huang	**Series 2. Longicalycifera** (Huang) Huang
2 a. *D. gracile* Gage	7. *D. gracile* Gage
	7 a. var. *gracile*
	7 b. var. ***newtrelandum*** Huang
	11. D. *papuanum* Hallier f.
	11 a. var. *papuanum*
2 b. var. *tuberculatum* Huang	11 b. var. ***tuberculatum*** (Huang) Huang
Subsection 2. Daphniphyllum	**Series 1. Daphniphyllum**
3. *D. glaucescens* Blume	
3 a. subsp. *glaucescens*	
3 aa. var. *glaucescens*	
3 ab. var. *blumeanum* (Baill. ex Müll. Arg.) J. J. Sm.	
3 b. subsp. *borneense* (Stapf) Huang	1. *D. borneense* Stapf
3 c. subsp. *ceramense* Huang	4. *D. **ceramense*** (Huang) Huang
3 d. subsp. *celebense* (K. Rosenth.) Huang	(→ Subsection 2 species 3)
3 e. subsp. *dichotomum* Huang	5. *D. **dichotomum*** (Huang) Huang
	6. *D. glaucescens* Blume
	6 a. var. *glaucescens*
	6 b. var. *blumeanum* (Baill. ex Müll. Arg.) J. J. Sm.
3 f. subsp. *lancifolium* (Hook. f.) Huang	8. *D. lancifolium* Hook. f.
3 g. subsp. *luzonense* Elmer	10. *D. luzonense* Elmer
3 h. subsp. *scortechinii* Hook. f.	13. *D. scortechinii* Hook. f.
3 i. subsp. *sumatraense* Huang	14. *D. **sumatraense*** (Huang) Huang
3 j. subsp. *timorianum* Huang	15. *D. **timorianum*** (Huang) Huang
3 k. subsp. *buchananiifolium* (Hallier f.) Huang	(→ Series 3, species 2)
Subsection 3. Unicalycifera Huang	**Series 3. Unicalycifera** (Huang) Huang
4. *D. philippinense* Huang	2. *D. buchananiifolium* Hallier f.
5. *D. woodsonianum* Huang	16. *D. woodsonianum* Huang
Section 3. Staminodia Hurusawa	**Subsection 2. Staminodia** (Hurusawa) Huang
	3. *D. celebense* K. Rosenthal
6. *D. parvifolium* Quisumb. & Merr.	12. *D. parvifolium* Quisumb. & Merr.

DESCRIPTIONS

4. Daphniphyllum ceramense (T.C. Huang) T.C. Huang, *stat. nov.*

Daphniphyllum glaucescens Blume subsp. *ceramense* T.C. Huang, Taiwania 12 (1966) 190, f. 32. — Type: *Eyma 2047* (BO holo; K, L iso).

Leaves short, narrowly elliptic, apex cuspidate, base acute-obtuse, 4–6 by 1.8–2.5 cm, coriaceous, shining on both surfaces, lateral veins 6 pairs, reticulation fine. Sta-

minate inflorescences 2.5–4 cm long, pedicles angulate, 5–7 mm, calyx lobes 4 or 5, linear-ovate, 4/5 as long as androecium, caducous, articulate, stamens 8 or 9, filaments flat-oblong, 2–4 mm, anthers oblong to oblong-ovate, 1.2–1.6 mm long, apiculate. Pistillate inflorescences 2–2.5 cm long, calyx lanceolate, two whorls of several free lobes, ovary blue green, style branches recurved. Fruiting axes 2–3 cm long, drupes smooth, ellipsoidal, green, later black purple, 1.3 by 0.7 cm; fruit stalk 5 mm long.

Distribution — Indonesia: Moluccas (Ceram).

Notes — The species is similar to *D. borneense* Stapf except for having obscure leaf venation and caducous calyces on staminate flowers. The free, lanceolate, two-whorled calyx lobes are very peculiar.

The name refers to the island Ceram.

Specimens examined. MOLUCCAS. Ceram: first open slope of Mt Moerkele besar, *Eyma 2046, 2047* (L).

5. Daphniphyllum dichotomum (T.C. Huang) T.C. Huang, *stat. nov.*

Daphniphyllum glaucescens Blume subsp. *dichotomum* T.C. Huang, Taiwania 12 (1966) 190, f. 31. — Type: *Clemens s.n. & Suppl.* (US lecto; A, BO, L, NY, US, iso).
Daphniphyllum reticulatum H. Heine, Feddes Rep. 54 (1951) 232, non Keng (1951).

Shrub or small tree, 7.5 m high, 60 cm in diam., bark smooth grey, inner bark yellowish, sapwood white yellowish. Leaves narrowly elliptic, apex acuminate, base cuneate, 7–10 by 2.2–2.9 cm, coriaceous, green on both surfaces, veins delicately reticulate and prominent on both surfaces, with 4 or 5 pairs of obscure lateral veins; petioles 0.8–2 cm long. Pistillate inflorescences 2.5 cm long; calyx 4- or 5-lobed, lobes triangular, caducous, styles recurved; pedicels c. 2 mm long. Fruiting axes 2.5–4.5 cm long, 1 mm thick; drupes ovoidal, 7 mm long, 6 mm thick without calyx, green and red brown when ripe; fruit stalks 4–5 mm long, 1 mm thick.

Distribution — Indonesia: Borneo (Sabah, Sarawak).

Habitat & Ecology — Primary forest on limestone cliff and boulders of organic soil at an altitude of 960 m.

Notes — This species differs from *D. borneense* Stapf mainly by its narrowly elliptic leaves and its occurrence at low elevation. It is closely allied to *D.* sumatraense.

The name refers to its dichotomous branchlets. The vernacular name is *teradamu bukit* (Dyak dialect).

Specimens examined. BORNEO. Sabah: Kinabalu National Park, near park headquarters above Helicopter landing, *Aban & Patrick Lassan 79578* (L); Sarawak: Gunong Api, Ulu Melinau, Tutoh, Baram District, NE flank of mountain, *J.A.R. Anderson 30884* (L).

7. Daphniphyllum gracile Gage

Daphniphyllum gracile Gage, Nova Guinea 12 (1917) 480; T.C. Huang, Taiwania 12 (1966) 155, f. 22; Barker in Henty, Handb. Fl. Papua New Guinea 2 (1981) 34. — Type: *Pulle 2439* (L lecto; BO iso).

b. var. **newirelandum** T.C. Huang, var. nov. — Fig. 2

A varietate gracile foliis tenuitibus non-glaucis differt. — Typus: *Gideon s.n.* (CANB 462230, holo).

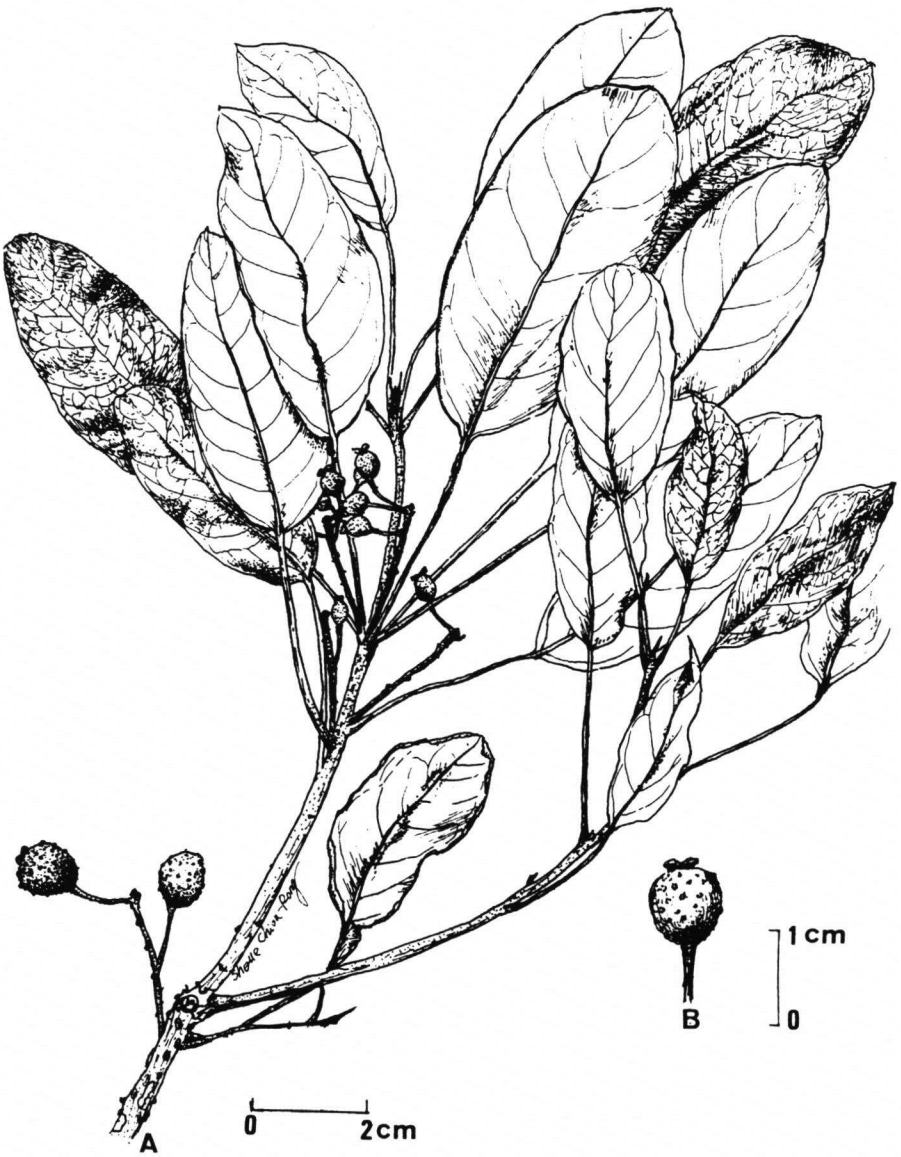

Fig. 2. *Daphniphyllum gracile* Gage var. *newirelandum* T.C. Huang. A. Twig with fruits; B. tuberculate drupe.

Shrub, c. 3 m high, with a round crown. Leaves oblong-elliptic, apex obtuse, cuspidate or mucronate, base obtuse, 6.5–10 by 2.5–4 cm, margins revolute, semi-coriaceous, lateral veins 7 pairs, membranous. Fruiting axes 2.5 cm long, calyx narrow, caducous, styles short, divaricate, caducous; drupes green, ellipsoidal, 8–10 mm long, 7–8 mm in diam., smooth to verrucose.

Distribution — Bismarck Archipelago, New Ireland, endemic.

Habitat & Ecology — This variety grows on top of a small hill (dominated by *Gleichenia*) which is continuously burnt; altitude 980 m.

Note — The name refers to the island New Ireland.

Specimens examined. BISMARCK ARCHIPELAGO. New Ireland: Subprov. Konos, E of Lelet farm, *Gideon s.n.* (CANB 462230, holotype); Lelet plateau, *Gideon & Obedi s.n.* (CANB 462228, paratype).

11. **Daphniphyllum papuanum** Hallier f.

Daphniphyllum papuanum Hallier f., Meded. Rijks Herb. Leiden 37 (1910) 13. — Type: *Sayer 1887* (L holo).

b. var. **tuberculatum** (T.C. Huang) T.C. Huang, *comb. nov.*

Daphniphyllum gracile Gage var. *tuberculatum* T.C. Huang, Taiwania 12 (1966) 159, f. 22E; in Henty, Handb. Fl. Papua New Guinea 2 (1981) 37, excl. specim. *Sayer 1887.* — Type: *Brass 13705* (A holo; BO, L iso).

Shrub or small tree in understorey, 3–15 m high, 2–24 cm diam., outer bark grey or brown, large pustular, brown green, scrape green, inner bark light brown, yellow, blaze amber yellow, sap staining wood yellow, wood cream, white or straw-coloured, yellow, buds green. Leaves oblanceolate to lanceolate, 5–20 by 3–7.5 cm, apex acuminate, base cuneate, margins entire, hard chartaceous, lateral veins elevated above, 9–14 pairs, not glaucous, innovations light shining green above, adult leaves green, glaucous or not beneath; petiole red, 1.3–5 cm long, 0.6–1 mm wide. Staminate inflorescences 4–5.5 cm long, calyx caducous, stamens 8–10, anthers elliptic, apiculate, 1 mm long, 0.6 mm wide; pedicels 6–12 mm long. Pistillate flowers with bluish pruinose ovaries, stigmas bi-recurved, subsessile, purplish red, centre brownish black. Young fruit green, shaded brown or glossy light green on a pendant axis, often numerous; pedicels 6–8 mm long. Fruiting axes 3–4.5 cm long, 0.8 mm wide, drupes oblique ovoid to ovoid-ellipsoidal, green then dark brown, black, tuberculate or verrucose, 7–10 mm long, 7–9 mm wide; fruit stalks 5–12 mm long.

Distribution — Endemic to New Guinea (Irian Jaya and Papua New Guinea).

Habitat & Ecology — In secondary forest on limestone, burnt area, well-drained volcanic soil, in mixed primary forest; broad ridge forest; lower montane rain forest, on a *Castanopsis*-dominated ridge, and submontane *Nothofagus* rain forest; at altitudes between 900 and 2660 m .

Notes — The type variety of *D. papuanum* differs from variety *tuberculatum* by the surface of the drupes only; the former has a smooth to verrucose surface and the latter a tuberculate surface.

This species is similar to *D. glaucescens* Blume but differs only by its caducous calyx. The name refers to its tuberculate drupe.

Specimens examined. INDONESIA. Irian Jaya: Baliem valley, above Wellesey, *Kostermans & Soegeng 665* (L). — PAPUA NEW GUINEA. W Sepik District: Folongonom, forest edge, *Veldkamp 6719* (CANB); Telefomin Subdistrict, Hindenburg Range, Mt Amdutakin, *Vink 17619* (CANB, L); Oksapmin, *Henty, Isgar & Galore 41725* (CANB, L); Mogofogola R., above junction with Bielga R. on Folongonom-Busilmin track, *Vinas & Wiakabu 59612* (CANB, L); E Sepik District: S of Nerenavip village on Hindenburg R. range, *Frodin 32153* (CANB, L). – Western Highlands District: c. 4 miles NW of Kupalis, near Wabag; ecological site no. 39, *Flenley 2354* (L); ibid. no. 11, near Yogonda, 20–25 miles W of R. Lai, near Wabag, *Flenley 2611* (CANB, L); near Lutheran sawmill at Yaibos, near Wabag, ecological site no. 19, *Flenley 2295* (CANB, L); ibid. no. 26, top of ridge, 2.5 miles S of Kompiam, Wabag subdistrict, *Flenley 2811* (CANB); near Pokaris, Kompiam, *Flenley 2891* (CANB); Kuboo Range, Uinba, Nona-Minj Divide, W .Vink 1649 5 (CANB); Hagen Subdistrict, alpine Manduka, Kebaka, upper Kauge, *Brass 338* (CANB). – Southern Highlands District: Mendi subdistrict, 2 miles W of Iaro R. bridge, south slopes of Mt Giluwe, *Croft & Nimmo 61075* (L). – Eastern Highlands District: Mt Bosavi, northern side, *Jacobs 941* (CANB, L); Mt Michael, northward slope, *Brass 31360, 31468* (CANB); 4 km SW of Bernhard Camp, Idenburg R., *Brass 13705* (A, holotype). – Milne Bay District: Mt Wadimana ridge, NE from Mt Simpson, *Pullen 7853* (CANB, L). – Morobe District: Wau Subdistrict, head of Bulolo R., *Kairo & Streimann 35627* (CANB, L). – Central District (Port Moresby Subdistrict): N end of Lake Myola no. 1, E of Ildra Creek, *Croft & Lelean 60531* (L). – West New Britain: NE slope of Mt Tangis, SW of Airagilpua, Talasea, *Frodin 26291* (L). – East New Britain District (Pomio Subdistrict): Helicopter pad, Mt Lululua, *Stevens et al. 58348* (L).

14. Daphniphyllum sumatraense (T.C. Huang) T.C. Huang, *stat. nov.*

Daphniphyllum glaucescens Blume subsp. *sumatraense* T.C. Huang, Taiwania 12 (1966) 166, f. 24. — Type: *Meijer 7199* (L holo; CANB, L, iso).

Tree, 2–4 m high, branchlets terete, canaliculate. Leaves alternate-fasciculate; blades lanceolate to narrowly elliptic, slightly falcate, apex acuminate, base cuneate, 5–10 by 2–4 cm, chartaceous, green above, glaucous and papillose beneath, veins 7–10 pairs, very thin, obscurely protruding on both surfaces, midrib slightly ascending beneath; petioles semi-spherical, 1.5–2.5 cm long. Staminate inflorescences flat, 1.5–4.5 cm long, calyx shallowly campanulate,4- or 5-lobed, lobes short, broadly triangular, acute at apex, margins entire or serrulate, c. 0.2 mm long, 0.4 mm wide; stamens 7–10, subsessile, filaments oblong, 0.1 mm long, apiculate or mucronate at apex, dorsally compressed; pedicels flat, 2–4 mm long. Pistillate inflorescences angulate, 2–4 cm long, calyx 4- to many-lobed, ovate or oblong, subentire, acute or irregularly divided at apex, c. 0.2 mm long, reticulate, caducous, ovary elliptic-globose, styles nearly as long as ovary, stigmas radiate-revolute; pedicels terete, 1–2 mm long. Fruiting axes angulate, 1.5–3.5 cm long; drupes obliquely obovoid, acute at apex, 7 mm long, 4 mm in diam., black, tuberculate, staminodia present; fruit stalks 1–3 mm long.

Distribution — Indonesia: Sumatra.

Habitat & Ecology — In secondary forests at altitudes from 500 to 1000 m.

Notes — The species is similar to *D. glaucescens* Blume, *D. luzonense* Elmer and *D. lancifolium* Hook. f. but differs from the first two by shorter fruiting pedicels and from the latter by the small, smooth drupes.

The name refers to Sumatra.

Specimens examined. INDONESIA. W Sumatra: Mt Sago near Pajakumbuh, above Padang Mengatas, *Meijer 7199* (L).

15. Daphniphyllum timorianum (T.C. Huang) T.C. Huang, *stat. nov.*

Daphniphyllum glaucescens Blume subsp. *timorianum* T.C. Huang, Taiwania 12 (1966) 192. — *Forbes 3809* (BM lecto).
Daphniphyllum gracile auct. non Gage: K. Rosenthal in Engler, Pflanzenr. 68, IV.147a (1919) 1–16.

Small tree, 6–15 m tall, 5–20 cm diam., outer bark smooth, light brown, 5 mm thick, living bark 3 mm thick, light brown. Leaves fascicled at tip of branchlets; blades elliptic, narrowly elliptic to oblong-elliptic, acute, acute-acuminate to cuspidate at apex, acute to obtuse at base, 5–15.5 by 2–4.5 cm, entire, green, thick membranous, shining on both surfaces, lateral veins 6–8 pairs, veinlets reticulate, prominent on both surfaces; petioles 1.2–3 cm long, 1 mm thick. Staminate inflorescences racemes 2–3 cm long; male flowers reddish or pale green, calyx 4- or 5-lobed, triangular, persistent, stamens 5–10, anthers oblong, elliptic, 1–1.5 mm long, 0.8–1 mm thick, apiculate to cuspidate at apex; pedicels 3 mm long. Pistillate inflorescences 1–2 cm long, calyx irregularly deeply 5-lobed, staminodes present, styles circinnate or divaricate, as long as or longer than ovary; pedicels 10–15 mm long. Fruiting axes 2–5 cm long; drupes ellipsoid, smooth to rugose, 8–12 mm long, 6–8 mm in diam., calyx caducous on drupe, fruit stalks 0.5–1.8 cm long.

Distribution — Indonesia: Lesser Sunda Islands (Flores, Timor).

Habitat & Ecology — In mountain areas at altitudes from 1100 to 1800 m.

Notes — Plants of higher elevations (1700–1800 m) possess smaller oblong-elliptic blades and smooth drupes while those of lower elevations (1100 m) appear to have long oblong-elliptic blades and tuberculate drupes. All plants have thick membranous blades with more or less prominent reticulate venation on both surfaces.

The present species is similar to *D. glaucescens* Blume var. *blumeanum* (Baill. ex Müll. Arg.) J.J. Sm. except the somewhat longer shape of the blades.

The name refers to the island Timor. Vernacular names: *koci* and *lere* in the Lesser Sunda Islands.

Specimens examined. INDONESIA. Lesser Sunda Islands: Flores: West-Ruteng, Potjo Ri'i-Potjo Ngando Napu, *Schmutz 1777, 1809, 1817* (L); Manau near Ruteng, *Kostermans & Wirawan 484* (L); Mt Banaka, *Kostermans & Wirawan 696* (L); Naepesu-Mutis, *Schmutz 2327* (L); Lema, Golo Ponto, *Schmutz 2982* (L, holo). – Timor: Lindo Pedido, *Metzner 234, 251, 253, 255* (L); *Forbes 3807* (BM, type of *D. gracile* Rosenthal), *3809* (L, holotype; BM, type of *D. gracile* Rosenthal).

The following specimens possess the tuberculate type of drupes. They were collected in the Lesser Sunda Islands, at altitudes from 1100 to 1675 m.

Flores: Denge to Hae Rebo, via Mt Gontanao, *Schmutz 3533* (L); Todo, Mt Desu, *Schmutz 3484, 3498* (L); Manau near Ruteng, *Kostermans & Wirawan 486* (CANB), *511* (CANB, L).

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LIST OF COLLECTIONS

Numbers between brackets refer to the numbers of the 16 accepted Malesian species (see the list on page 236). Collections without number and date have not been inserted.

Aban & Patrick Lassan 79578 (5) — Anderson, J.A.R. 30884 (5), 31615, 31972 (9) — Anderson & Chai 29922 (9) — Aseh ak Luang 2276 (6b).
van Balgooy 506, 524 (7a) — Beguin 1470 (11a) — Blume s.n., 1908 (6a) — Bower 338 (11b) — Brass 9525 (7a), 13705 (11b), 30139, 30190, 30254, 30260 (7a), 31360, 31468 (11b).
Carlquist 15500 (13) — Chew Wee Lek & Corner 5886 (1) — Chew Wee Lek, Corner & Stainton s.n., 1961 (1) — Coode & Katik 32983 (7a) — Coode & Stevens 46234 (7a) — Craven 2992 (7a) — Croft 61811 (7a) — Croft & Lelean 34633, 60531, 65826 (7a) — Croft & Nimmo 61075 (7a) — Croft et al. 60718, 71046 (7a) — Curran, Merritt & Zschokke 18357 (2).
Elmer 8015 (10), 8538 (2) — Eyma 2046,2047 (4).
Flenley 2295, 2354, 2611, 2811, 2891 (11b) — Forbes 3807, 3809 (15) — Frodin 885 (7a), 2629 (11), 26829, 28273 (7a), 32153 (11b).
Galore & Wood 41002 (7a) — Gillison 25133, 25173, 25596 (7a) — Grubb & Edwards 1 (7a).
Hartley 12112, 12112A, 12503 (11b), 12748, 12748A, 12785, 13666 (7a) — Haviland 1070 (1) — Henty, Isgar & Galore 41725 (11b) — Hoogland 9522 (7a) — Hope s.n., 1970 (11b) — Hou, Ding 250 (1), 758 (9).
Jacobs 7252, 7288, 7556 (2), 8886, 8887, 8916 (6a), 9414 (11b) — Johns, Moi & Rau 1578 (7a).
Kairo & Streimann 35627 (11b) — Kalkman 4994, 5129 (7a) — Katik & Kairo 39884 (7a) — Kerenga et al. 74441 (7a) — Kerenga & Cruttwell 56651 (7a) — King's collector s.n., 1884 (6b), 7007 (8) — Kochummen 2273 (9) — Koster 13764 (7a) — Kostermans 1217, 1229 (11a) — Kostermans & Soegeng 665 (11b) — Kostermans & Wirawan 484, 486, 511, 696 (15).
LAE series 77162 (7b) — Lam 3706 (11a) — Lavarack 30571 (7a).
Meijer 7199 (14), 54275, 57528 (1) — Mendoza 97535 (10) — Merrill s.n., May 1914 (2) — Metzner 234, 251, 253, 255 (15) — Mikil 46553 (1) — Millar 40784 (7a) — Millar & Sayers 23715 (7a).
Ng 591(6a) — Nooteboom 4607 (1).
Ogata 110316 (6b).

Paie 26315, 26365, 28080 (9) — Paijmans 955 (7a) — Pullen 6719, 7853 (11b), 8022 (7a).
Rahim 97948, 97949, 98934, 98935 (9) — Ramos s.n., Dec. 1913, s.n., July/Aug. 1915 (2) — Ramos & Edaño s.n., May 1917, s.n., May/June 1925, s.n., Oct. 1921, 28705 (2), 45687, 45708 (12) — Ridsdale 36814 (7a) — Ridsdale & Lavarack 30571 (7a) — van Royen 10911, 30051 (7a).
Sayers s.n., 1887 (11a) — Schmutz 1777, 1809, 1817, 2327, 2982, 3484, 3498, 3533 (15) — Scortechini 7326 (13) — Sleumer & Vink 14292, 14296, 14235, 14348 (7a) — Soepadmo & Mahmud 1131 (6a), 1193 (9) — van Steenis 8362 (16) — Stevens 46234 (7a) — Stevens & Foreman 55789 (7a) — Stevens & Lelean 58282 (7a) — Stevens & Veldkamp 885, 54009, 54211, 54230 (7a) — Stevens et al. 58348 (7a) — Stone 11364 (1), 53216 (7a) — Streimann et al. 27812, 58348 (7a) — Sulit 5573 (2).
Teijsmann 13664 (3).
Vandenberg 39512, 39653 (7a) — Vandenberg, Katik & Kairo 39741, 39884 (7a) — Veldkamp 6388A, 6476 (7a), 6719 (11b), 54211, 54230 (7a) — Veldkamp & Vinas 7595, 7595A (7a) — Vinas & Wiakabu 59306 (7a), 59612 (11b) — Vink 16495 (11b), 16042, 17060, 17303 (7a), 17619 (11b) — Vink & Schramm 8828 (7a).
Wade 7707 (7a) — Wallich 8020 (9) — Whitmore 3319, 3789, 3809, 3888, 12674 (6a), 12906 (6b), 15473 (13), 20703 (9) — Wiakau & Veldkamp 73727 (7a) — de Wilde & de Wilde-Duyfjes 15442, 16002 (L, 16) — Womersley 24636, 25596, 37369, 55296 (7a).
Zollinger 2140 (6b)