Florae Malesianae Precursores - LVIII, Part Two*
The Genus *Gordonia* (Theaceae) in Malesia

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Abstract

This is a taxonomic treatment of 21 species of *Gordonia* (of the family Theaceae) found in the Malesian region. Among these, there are two new (*G. borneensis, G. sarawakensis*) and two newly combined (*G. integerrima, G. vulcanica*) species. Besides, two excluded (*G. brevifolia, G. lobbii*) and two doubtful (*lanceifolia, G. sarasinii*) ones are briefly mentioned. A complete list of scientific names and their synonyms is presented in an index.

I. INTRODUCTION

The genus *Gordonia* was established by John Ellis in 1771 in honour of James Gordon (1728–1791), an English nurseryman. The type species *Gordonia lasianthus* (L.) Ellis (basinym: *Hypericum lasianthus* L.), is a tree originally from the coastal plain areas along Loblolly Bay in eastern North America.

Gordonia Ellis is a conserved generic name against the earlier name, *Lasianthus* Adanson (1763). In addition, a number of synonyms were proposed by different authors. Some of them perpetuate to this day. The most controversial one is *Laplacea* HBK (1822), which is based on a plant (*Laplacea speciosa* Kunth ex HBK) from Ecuador in South America. The original *Gordonia*, namely *G. lasianthus* Ellis, differs considerably from the type species of *Laplacea*, namely *L. speciosa* HBK. They differ in various aspects of pedicels, bracteoles, sepals, petals, androecia and gynoecia. These differences gradually break down when many more species were subsequently discovered and described. Even in recent literature, several authors (e.g. Melchior, Kobuski) maintain *Laplacea* as a separate genus mainly on the ground of the usually 5 short, free styles; while others (e.g. Burkill, Merrill, Sealy) advocate that these two genera, *Gordonia* and *Laplacea*, should be merged. A formal fusion was made by the present writer (Keng 1980).

For the Asiatic *Gordonia* species, the earliest synonym is *Polyspora* Sweet (1826). It was named after a plant originally described under the name *Camellia axillaris* Roxb. ex Ker. The flowers of this plant are almost sessile, the bracteoles and bracts pass gradually into sepals which protect the rest of the flower parts in bud, the style is stout and 5-fid at the apex. Other notable synonyms are *Antheeischima* and *Closaschima* of Korthals (1842), who tended to think that plants from America and Asia could not be possibly accommodated in the same genus. Korthals' two new genera were based on two Malesian plants, *Gordonia excelsa* Bl. and *G. ovalis* Korth., respectively.

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* Part One: The Genus *Pyrenaria* (Theaceae) in Malesia, *Gard. Bull. Sing.* 33 (1980) 264–289.

Like Korthals, Pitard, (1902) also emphasized the geographic separation between Asia and America, and established the genus *Nabiasodendron* for the Asiatic *Gordonia* species. Besides some external morphological characters, Pitard mentioned some dubious internal anatomical features to stress that the Asiatic species should be classified in a separate genus. For critical discussions of these and other synonyms of *Gordonia*, see Burkill (1917) and Sealy (1958).

On the other hand, the first botanist who referred the Asiatic plants to *Gordonia* is Blume (1825). The Javanese plant was at first described as *Schima excelsa* Bl. in 1823; two years later, it was transferred by himself to *Gordonia*, namely, *G. excelsa* (Bl.) Bl.

II. A General Account of the Taxonomic Characters

The Malesian *Gordonia* species are mostly small or medium-sized trees. Some species, however, are lofty trees which can reach 60 m or more in height, while others are shrubs which are usually found in high altitudes (e.g. *G. imbricata* and *G. vulcanica*).

The leaves are alternate, well-spaced, mostly spirally arranged on branchlets. The leaf-bases are acute, attenuate or rounded, sometimes decurrent along the petiole and forming two narrow wings (e.g. *G. multinervis, G. singaporeana* and *G. oblongifolia*), which are especially prominent in young trees and saplings. The nerves are usually visible and often intermingled with smaller, parallel veins and complicately looped and merged near the margin into submarginal veins or reticulations. The secondary veins are invisible in a few species (e.g. *G. imbricata* and *G. ovalis*). The tertiary veins and reticulations, in general, cannot be clearly seen, except after treatment with dilute sodium hydroxide (as seen in some of the illustrations accompanying this paper). The venation is found to be useful in separating some related species and in identifying sterile material of *Gordonia*.

The flowers are borne in leaf-axils, often in the upper axils, usually solitary, rarely 2–3 in a cluster. Each flower is usually subtended by one bract and two bracteoles which are generally caducous. In *G. maingayi*, however, the bracteoles, bracts and sepals, not being clearly differentiated, together form perules subtending the corolla at anthesis. While in most of the other species, the bracteoles, bracts and sepals are ± differentiated, the bract and bracteoles are caducous, only the sepals being present at anthesis. The peduncles vary in length, the flowers are sessile or subsessile in some species.

The differentiation between calyx and the corolla in most species is clear: sepals are 5–6 in number, thick and hairy; petals are also 5-6, generally thick (at least in their lower middle part) and briefly joined at the base into a short corolla-tube and shed together after anthesis. In *G. sarawakensis*, the petals are 8–10 in number, but they are relatively narrow, arranged in one series; whereas in *G. borneensis* and *G. polisana*, the petals are also 8–10 in number, but are very broad, arranged in two distinct series. In the two latter species, the petals of the outer series are smaller and somewhat intermediate between sepals and petals.

The androecium consists of numerous stamens which are in 3–4 whorls, usually briefly fused at the base, sometimes in 5 (or 4) groups. The filaments are glabrous or hairy, or more often the upper part glabrous and the lower, hairy. They are always adnate to the base of the corolla and shed together after anthesis.

The gynoecium consists of a usually hairy, ovoid or subglobose ovary, one (solitary or branched) or several (5, rarely 3 or 4 more) free styles, of which the tip is enlarged into a stigma. Exceptions are found in *G. ovalis* and *G. sarawakensis* in which species the styles are absent and the stigmas lie on top of the ovary. In each ovary-locule, 3–5 ovules are found.

The fruits are capsular, angulate, cylindric-oblong to ellipsoid, rarely broadly ovoid (e.g. *G. borneensis*) or subglobose (e.g. *G. sarawakensis*), dehiscing loculicidally from the top downwards. As they are mostly 5-locular, they thus often dehisce into 5 valves. In those species with ovary-locules other than 5, the number of valves is generally in accordance with that of their ovary-locules; thus 3 (-4) in *G. scortechini*, and 7–8 in *G. sarawakensis*. In the last named species, septicidal lines can be clearly seen in the lower part of the fruit. In fully matured fruits of all *Gordonia* species, the valves break away for most of their length from the stout columella, but remain attached to it at the base for some time and eventually disintegrate.

The seeds are usually ovoid or ellipsoid, always flattened, 2–3 in each locule, with a large obliquely attached apical wing. Superficially they resemble the seeds of some conifers (e.g. *Pinus, Abies* or *Keteleeria*). The embryo is large, slightly bent, surrounded by a thin layer of endosperm.

III. Taxonomic Treatment

Gordonia Ellis

Gordonia Ellis, Phil. Trans. London 60 (1771) 518, *t. 11* [Type species: *Gordonia lasianthus* (Linn.) Ellis]; Benth. in B. & H. Gen. Pl. 1 (1862) 186 (incl. *Laplacea*); Szyszyl. in E. & P. Pflanzenfam. 3, 6 (1893) 185 (*incl. Haemocharis*); Melchior in E. & P. Pflanzenfam. ed. 2, 21 (1925) 136, *f. 63 (incl. Laplacea)*; Burkill, J. Str. Br. Roy. As. Soc. 76 (1917) 133 (*incl. Haemocharis*); Merrill, J. Str. Br. Roy. As. Soc. 86 (1922) 332; Sealy, Rev. Gen. *Camellia* (1958) 8; H. Keng, Gard. Bull. Sing. 33 (1980) 308. *Nom. cons.*

Lasianthus Adans., Fam. 2 (1763) 398 [*non* Jack (1823), *nec* Zucc. *ex* DC (1836)].

Laplacea HBK, Nov. Gen. Sp. 5 (1822) 207, *t. 461.*

Lindleya Nees, Flora 4 (1821) 299.

Haemocharis Salisb. *ex* Martius et Zucc., Nov. Gen. Sp. 1 (1824) 106.

Polyspora Sweet, Hort. Brit. ed. 1 (1826) 61.

Antheeischima Korth., Kruidk. (1842) 137, *t. 27.*

Closaschima Korth. op. cit. 139.

Carria Gardn. Calc. J. Nat. Hist. 7 (1847) 6.

Dipterospermum Griff., Notul. 4 (1854) 564.

Nabiasodendron Pitard, Act. Soc. Linn. Bordeaux 57 (1902) Cpt. Rend. Sc. 54.

Small to medium-sized trees, rarely shrubs. Leaves simple, coriaceous, alternate, spirally or distichously arranged, entire or serrate. Flowers bisexual, axillary, solitary or 2–3 (rarely more) congested in a cluster, shortly pedunculate or subsessile; bracteoles and bracts 2–3 or more; sepals 5–6, unequal; petals 5–6, rarely 9–10, unequal or subequal, usually briefly fused at the base; stamens numerous, in 3 or 4 whorls, shortly connate at the base and often briefly adnate to the corolla, sometimes in 4–5 less distinct fascicles; anthers versatile, on a short or long filament; ovary mostly 5-locular, rarely 8–10 or 3–4 locular; ovules 2–8 (usually 3–5) in each locule, on axile placentation in two vertical rows; styles mostly 5, sometimes more or only 3, fused to varying extent proximally, or sometimes totally free. Fruit a woody capsule, ovoid-cylindric, bluntly angulate, dehiscing loculicidally from apex to base along a persistent central columella. Seeds usually 2–5 in each locule, compressed, with a thin membranous, oblique, unilaterally attached wing; testa soft woody; embryo oblong, straight or slightly oblique; endosperm of a thin layer, enveloping the embryo.

A genus with about seventy species; occurs in SE. Asia and America. Forty or so Asiatic species are found from India, Sri Lanka, Burma, Thailand, Indochina, S. China to Taiwan and southwards to Malesia (the Malay Peninsula, Sumatra, Borneo, Java, the Philippines, Celebes to New Guinea). Thirty or so American species are concentrated in Central America and the West Indies (most of them formerly arranged under the generic names *Haemocharis* or *Laplacea*), with a few species in the northern parts of South America, and only one species (which is the type species) in the southeast of the United States of America.

About 21 species occur in Malesia.

Key to the Malesian *Gordonia* Species

1. Average leaves very large, generally over 15 cm long
   2. Peduncles of flowers generally less than 0.5 cm long
      3. Leaf-apex usually acuminate; nerves 10–11 pairs; flowers 5–6 cm across (the Malay Peninsula) ..... 20. *G. taipingensis*
      3. Leaf-apex usually rounded and mucronate; nerves up to 18 pairs; flowers 3–4 cm across (the Malay Peninsula) ..... 12. *G. multinervis*
   2. Peduncles of flowers usually over 1.5 cm long
      4. Petioles conspicuously winged; sepals persistent in fruit
         5. Capsules broadly ovoid, 2–3 cm long (Borneo: Sabah and Kalimantan) ..... 2. *G. borneensis*
         5. Capsules cylindric, about 5 cm long (Sumatra) ..... 13. *G. oblongifolia*

4. Petioles not winged; sepals caducous in fruit; capsules broadly ovoid, about 5 cm long (Borneo: Sabah) ..... 4. *G. grandiflora*

1. Average leaves smaller, generally less than 15 cm long

6. Average leaves relatively small, usually less than 9.5 cm long

7. Leaf-apex generally obtuse or rounded, often emarginate; plants often found in montane or lower montane forest

8. Petals mostly 5, rarely 6, in one whorl; leaves thick coriaceous

9. Leaves elliptic, 4.5–9.5 cm long (the Malay Peninsula & Borneo) ..... 7. *G. imbricata*

9. Leaves ovate or broadly oblong 2–5 cm long; capsules 2.5–3 cm long (Sumatra) ..... 21. *G. vulcanica*

8. Petals 8–10, in two whorls; leaves thin-coriaceous (the Philippines) ..... 16. *G. polisana*

7. Leaf-apex mostly acute or acuminate, pointed or blunt and rarely rounded; plants generally found in lowland or at medium altitudes

10. Ovary 3- (rarely 4-) locular, the 3 (rarely 4) styles free; flowers very small (1.5–1.8 cm across) (the Malay Peninsula) ..... 18. *G. scortechinii*

10. Ovary 5- (rarely 4-) locular; styles fused together into a column, sometimes branched above; flowers various

11. Number of bracteoles, bracts and sepals rather large (around or over 10) and less clearly differentiated, together forming overlapping perules surrounding the flowers at anthesis (the Malay Peninsula) ..... 10. *G. maingayi*

11. Number of bracteoles, bracts and sepals generally less than 8, and usually differentiated; normally bracteoles and bract caducous and only the sepals present at anthesis

12. Leaf-apex generally acuminate and obliquely caudate; capsule cylindric, pointed, 3.5–5 cm long (the Malay Peninsula) ..... 15. *G. penangensis*

12. Leaf-apex acute or sometimes acuminate, but rarely caudate; capsules usually less than 3 cm long

13. Leaves 3–6 cm wide, often glaucescent beneath; flowers 3–3.5 cm across; styles solitary, with a club-shaped tip (Borneo: Sarawak & Sabah) ..... 5. *G. havilandi*

13. Leaves generally less than 3 cm wide, not glaucescent below; flowers less than 2.5 cm across; styles either branched or absent

14. Nerves visible; style 1.5–2.5 mm long, 5-branched above (Borneo) ..... 11. *G. marginata*

14. Nerves nearly invisible; style absent, only 5 tiny protrusions (less than 1 mm long) on top of the ovary representing the stigmas (Sumatra) ..... 14. *G. ovalis*

6. Average leaves generally between 10 to 14 cm long

15. Petals 7–8, in one series; ovary 8–10 locular, style absent or very short; fruit broadly ovoid or subglobose (Borneo: Sarawak & Sabah) ..... 17. *G. sarawakensis*

15. Petals 5–6; ovary 5- (rarely 4-) locular; style present; fruit generally ovoid or cylindric

16. Leaf-margin entire, subentire, very rarely serrulate (Java, Bali, Celebes) ..... 8. *G. integerrima*

16. Leaf-margin serrate or serrulate

17. Peduncles of flowers usually less than 0.5 cm long

18. Leaves subsessile or sessile, the blade usually tapering towards the base and winged; capsules 3 or 5 cm long

19. Leaves thin-coriaceous; nerves 10–12 pairs; flowers 4–5 cm across (the Malay Peninsula) ..... 19. *G. singaporeana*

19. Leaves membranous; nerves 12–18 pairs; flowers 2–3.5 cm across (the Malay Peninsula) ..... 12. *G. multinervis*

18. Leaves petiolate, petiole 5–8 mm long; leaf-base not winged; capsules 2 or 2.5 cm long (the Malay Peninsula) ..... 6. *G. hirtella*

17. Peduncles of flowers generally 0.5–1 cm long, sometimes longer

20. Style columnar, the tip enlarged, discoid, shallowly 5- (rarely 4-) lobed

21. Flowers 2.5–3 cm across; capsule 3.5–4.5 cm long (Sumatra and Java) ..... 3. *G. excelsa*

21. Flowers 7–8 cm across; capsules 3–4 cm long (the Philippines) ..... 9. *G. luzonica*

20. Style distinctly 5-branched above (Celebes, Lesser Sunda Isls., Moluccas and New Guinea) ..... 1. *G. amboinensis*

1. Gordonia amboinensis (Miq.) Merr., J. Str. Br. Roy. As. Soc. 86 (1922) 332. Fig. 1

Laplacea amboinensis Miq., Ann. Mus. Bot. Lugd. Bat. 4 (1968) 114 (based on *Lignum mucosum* vel *Caju lapia* Rumph., Herb. Amb. III (1743) 203, *tab.130*).

Haemocharis amboinensis (Miq.) Burk., J. Str. Br. Roy. As. Soc. 76 (1917) 141, 158.

Gordonia rumphii Merr., Interpret. Herb. Amb. (1917) 368.

Gordonia brassii Kobuski, J. Arn. Arb. 21 (1940) 135. **Syn. nov.**

Gordonia papuana Kobuski, op. cit., 136 (*incl.* var. *acuminata* & var. *montana*); W. R. Barker, Brunonia 3 (1980) 8 *f.1.* **Syn. nov.**

Gordonia sp. Kobuski, op. cit., 139 (citing *Brass & Versteegh 13169* from W. Irian).

Tree, to 20 (-25) m tall. Bark grey to brown, smooth or shallowly fissured; inner bark beefy red. Young twigs and buds covered with short silky hairs or glabrous. Leaf-blades thin coriaceous or membranous, lanceolate, narrowly ovate to ovate-elliptic, 7–14 (-20) cm long, 3–5.5 (-8) cm wide, apex bluntly acuminate, sometimes obtuse or retuse, base acute or attenuate; margin shallowly crenate to undulate, or subentire; nerves 9–12 pairs, intermingled with less conspicuous veins and merged

and looped into submarginal reticulation; glabrous above, glabrescent and sometimes papillate beneath; petiole 0.5–1 (-1.5) cm long, thickened. Flowers in the upper axils, solitary; peduncle 0.5–1 (-2) cm long, slender. Bracteoles and bracts 2–3, caducous. Sepals 4–5, unequal, deltoid, lunate or broadly ovoid, 4–6 mm long, coriaceous, densely covered with silky hairs externally. Corolla 3–4 cm across, creamy yellow or white; petals 5–6, broadly ovate to subrounded, concave, 1.5–2 cm long, the outer surface sericeous in the central portion and below, glabrous around the margin. Androecium 7–8 mm long, the filaments glabrous, except the base which is covered with short hairs. Gynoecium 5–8 mm long, shortly silky; ovary globose or ovoid, 3–4 mm in diameter; style (4-) 5-branched above. Capsule

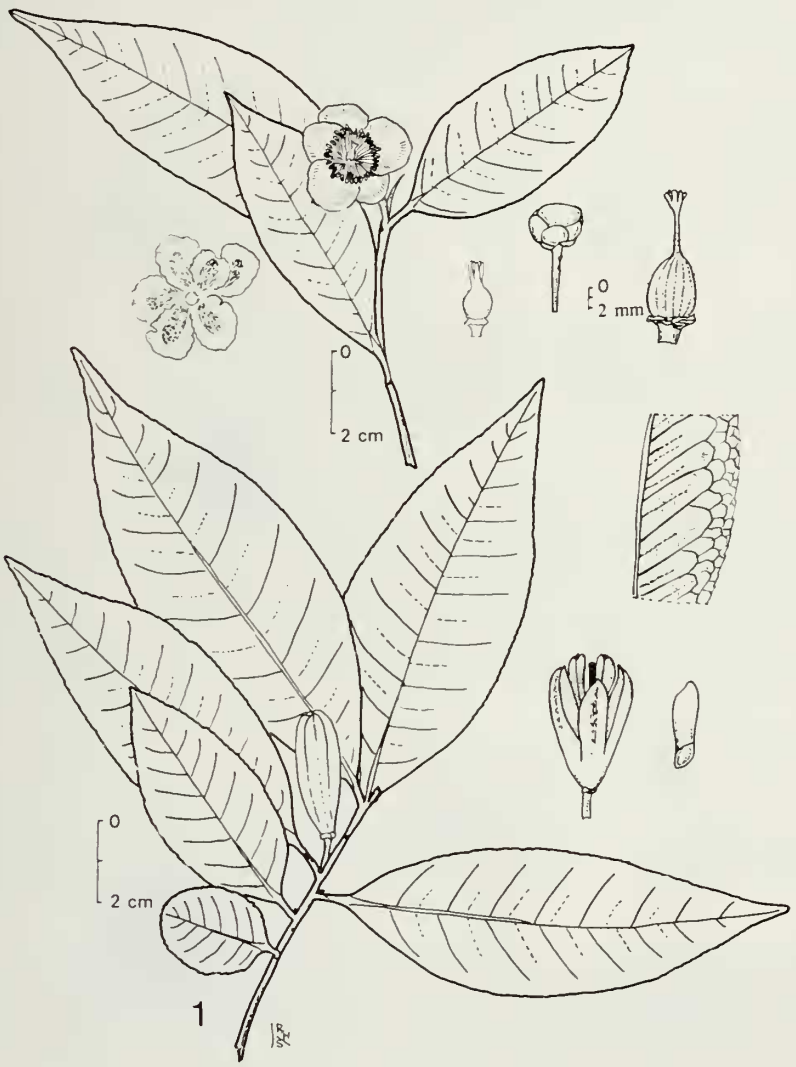

Fig. 1. *Gordonia amboinensis* (Miq.) Merr.
Ambon, *Teysmann H. B. 5587* (Herb. Lugd. Bat. No. *908, 249-227) (lectotype);* Halmahera, *Neth. Ind. For. Serv. 31360* (fr.).

oblong cylindric, 2.5–3 (-3.5) cm long, puberulous, dehiscing into 4 or 5 valves. Seeds about 2 cm long including the wing.

DISTRIBUTION. Malesia (Celebes, Moluccas, Lesser Sunda Isls. and New Guinea) and Bismarck Archipelago (New Britain and New Ireland). (All specimens cited below from L).

Celebes. Minahassa, *Koorders 18910, 18912, 18913, 18914*; Molili, *Neth. Ind. For. Serv. 481.*

Moluccas. G. Sembilan, Halmahera, *Pleyte 341*; Ternate, *Neth. Ind. For. Serv. 24534.* P. Buru, *Neth. Ind. For. Serv. 31360*, Ceram, *Eyma 2214, Kuswata & Soepadmo 240.* Ambon, *Robinson 276* (isotype of *Gordonia rumphii* Merr.); *De Vriese & Teijsmann Herb. Lugd. Bat. No. 908, 251–414; Teysmann H. B. 1970* (*Herb. Lugd. Bat. No. 908, 251-224, & -225*), *H. B. 5587* (*Herb. Lugd. Bat. No. 908,*

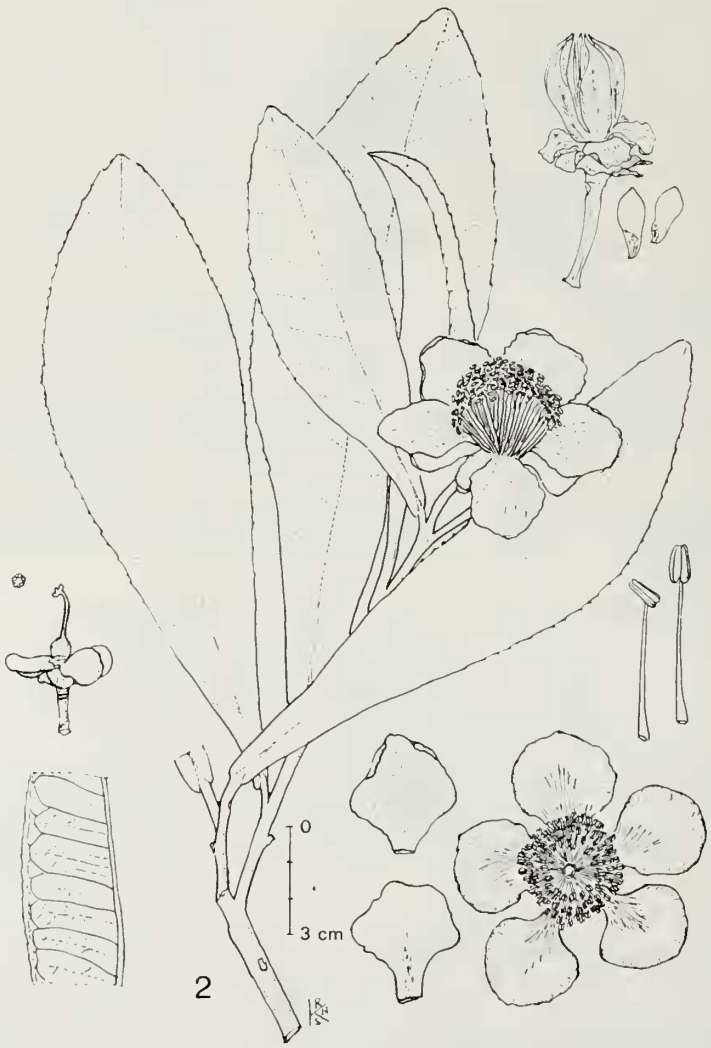

Fig. 2. *Gordonia borneensis* H. Keng **sp. nov.**
Kalimantan, *Kostermans 35063* (fl.); *Kostermans 13627* (fr.).

249–227, lectotype of *Laplacea amboinensis* Miq.)

Lesser Sunda Isls. Bali, Mt. Batukau complex, *Kostermans et al. KK-SS 137, 174.* Flores, near Wae Mao, *Kostermans 838*; Monde Hill, *Schmutz 3552, 3711.*

Irian Jaya (representative specimens only). Sidoarsi Mts., Hollandia D. 3t, *Iwanggin BW 9037*; Sibil Valley, Star Mts., *Kalkman 4285*; near Andai, SW. of Manokwari, *Koster BW 11798*; near Soendei, Isle of Biak, *Moll BW 9721*; Cycloop Mts., Hollandia Dist., *van Royen 3635*; Mt. Tohkiri, Vogelkop Peninsula, *van Royen & Sleumer 7253*; Tobie, Kebar Valley, *Schram BW 7970*; Aisao, Japen Isl., *Schram BW 10584.*

Papua New Guinea (representative specimens only). Arau, Eastern Highlands Dist. *Brass 32063*; Mt. Dayman, Maneau Range, *Brass 23243*; Torricelli Mts., W. Sepik Dist., *Darbyshire 358*; near Lake Birip, Wabag, W. Highlands Dist., *Flenley ANU 2738*; Above Akuna, E. Highlands Dist., *Hartley 11986*; upper Oriomo, Western Dist., *Havel 17246*; Kwa Mountain, Rossel Isl., *Henty NGF 27071*; near Frieda River, W. Sepik Dist., *Henty & Foreman NGF 42579;* Mt. Rawlinson, Morobe Dist., *Hoogland 9262*; Mt. Hunstein, Sepik Dist., *Hoogland & Craven 10951*; near Hagen Station, W. Highlands Dist., *Hoogland & Pullen 5965*; Lake Erobo, S. Highlands Dist., *Powell 2423;* Ingembit, Western Dist., *Ridsdale, Henty & Galore NGF 31943*; Marapuna, Eastern Highlands Dist., *van Royen NGF 15053*; Mt. Kumme, Central Dist., *van Royen NGF 20346, 20416*; Above Kiburu, Southern Highlands Dist., *Schodde 1371*; Mt. Simpson, Milne Bay Dist., *Schodde 5522*; Mt. Pigini; Central Dist., *Stevens LAE 50449*; near Kapiaggo, Western Highlands Dist., Vandenberg, *Womersley & Galore NGF 39995*; near Nondugl, Eastern Highlands Dist., *Womersley 4860.*

ECOLOGY. From lowland rain or swamp-forest to lower montane or montane moss forests, in *Eucalyptus-Gironniera, Castanopsis-Quercus*, or *Nothofagus* forests; on sandy or clay soil, also on limestone ridge and in disturbed areas and grassland. Altitudes 50–2000 m. Fl.: Apr.–Nov., fr.: Jun.–Jan. (few collections only).

VERNACULAR NAMES: *adikelp* (Japen), *alimp* (Tagoba), *bado* (Motus), *baif* (Gab-gab), *benelemonde* (Hattam), *bwabwa* (Wafu), *dapiri* (Mid. Waria), *dimi* (Kiwai), *iniaili* (Je), *kawal-gugn* (Mini), *kerkebo* (Flores), *kimkaroo* (Tehid), *la* (Enga), *kilimdan* (Sepit), *koka kaber* (Knambiadi), *kuku* (Kutub), *La* (Enga), *naningning* (New Britain), *oytungo* (Aseki), *reik* (W. Biak), *sjioe* (Andjai), *tawan* (Wipi), *timor* (Mendi), *toani* (Ormoe), *tokoi* (Manikiong), *totona Rombo* (Garumaia), *tugera* (Waskuk).

NOTE. Kobuski (1940) examined 8 specimens of *Gordonia* from New Guinea then available to him and recognised 4 entities — one uncertain species and two new ones of which one consisted of two varieties. Barker (1980) in a recent revision correctly pointed out that there is only one homogeneous species in New Guinea, showing little or no evidence of polymorphism.

When the New Guinea material was compared with those from Moluccas, Celebes and the Lesser Sunda Islands, they were found to agree in leaf, flower and fruit characters. I therefore adopt *Gordonia amboinensis* (Miq.) Merr. as the name for this widely distributed species.

Regarding the field notes of numerous collectors, the following two are noteworthy: on *Brass 23243* was stated that the flowers are 6–6.5 cm in diameter; this appears much larger than the usual size (3–4 cm in diameter). *Schram BW 10584* indicated

the flowers are pink; all the others are recorded as white, creamy white or creamy. Some specimens from Flores (e.g. *Schmutz 3711*) have much smaller capsules (less than 2 cm long) which are probably immature or from trees growing on extremely poor soil. They also may represent a new entity.

Gordonia amboinensis is closely allied to *G. excelsa*. The two are quite similar in shape and venation of their leaves. However, they can be differentiated by their shape and size of the flowers and geographically they are more or less demarcated.

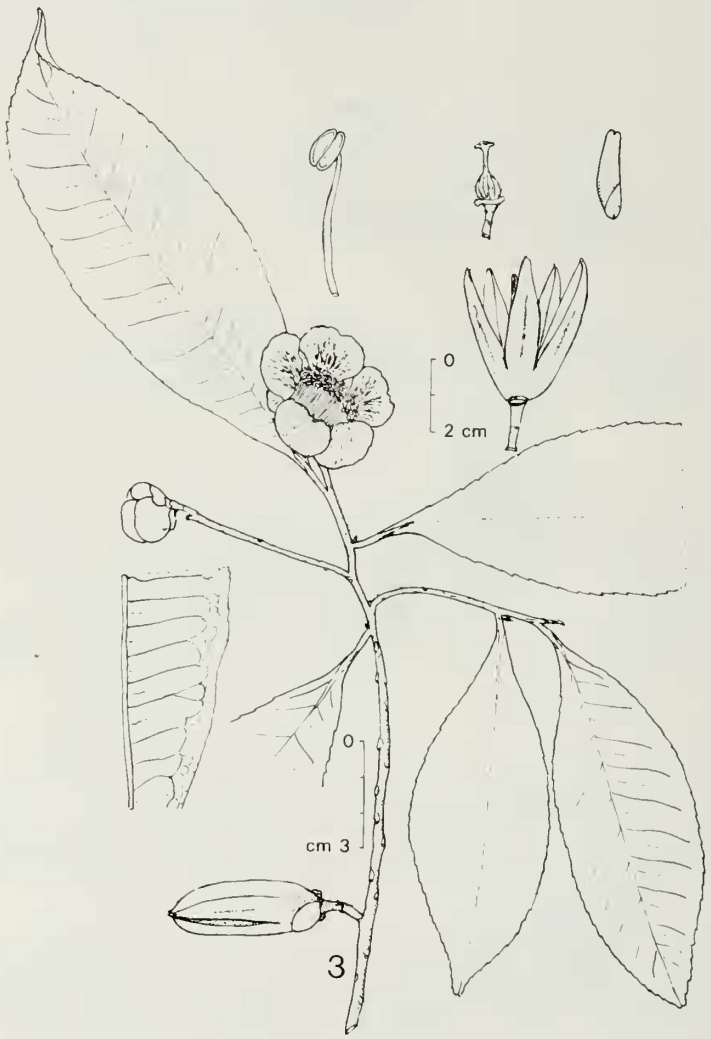

Fig. 3. *Gordonia excelsa* (Bl.) Bl.
Java, Cult. in Hort. Bog. *No. 161* (*Anno* 1901); *Koorders 14735* (fr.).

New combinations arising from a new classification of non-African Restionaceae

Barbara G. Briggs and L.A.S. Johnson†

Abstract

Briggs, Barbara G. and Johnson, L.A.S. (Royal Botanic Gardens, Mrs Macquaries Road, Sydney, NSW 2000, Australia) 1998. New combinations arising from a new classification of non-African Restionaceae. Telopea *8(1): 21–33.* New combinations are made in accord with a new, broadly based classification of extra-African Restionaceae. These involve 39 Australian species, of which two extend to New Guinea and the Aru Islands, and one species in each of south-east Asia, New Zealand and Chile. The name *Baloskion* Raf. is adopted for eight eastern Australian species excluded from *Restio* Rottb. and *Desmocladus* Nees is adopted for a group of Western Australian species mostly transferred from *Loxocarya* R. Br. The previously monotypic genera *Meeboldina* Suesseng. and *Sporadanthus* F. Muell. are enlarged. Most other changes involve newly described genera. Four combinations replace illegitimate epithets, two new combinations are made at subspecific rank, and lectotypes are selected for 18 taxa.

Introduction

A new classification of the genera and species of Australian Restionaceae has been developed through study of exomorphology, anatomy, pollen, seed ornamentation, and flavonoids, with associated DNA sequence studies in progress. The classification is outlined by Briggs and Johnson (1999) and Linder, Briggs and Johnson (1998). It has led to the recognition of 16 new genera (Briggs & Johnson 1998) and has shown that the species hitherto included in some of the genera are unnatural assemblages of taxa. The largest group of inappropriately placed species have until now been referred to *Restio* Rottb. These were thus given the name of a genus that, as now circumscribed (Linder 1984, 1985; Linder, Briggs & Johnson 1998; Briggs & Johnson 1999), is confined to Africa and Madagascar. In addition, the epithets in use in some combinations were illegitimate.

Forty two new combinations at specific rank are therefore provided here, together with two new subspecific combinations. This will validate many of the names used in the forthcoming book *Australian Rushes — Biology, Identification and Conservation of Restionaceae and allied families* (Meney & Pate (eds) 1999). In addition, there still remain 45 undescribed species that we recognise in Australian Restionaceae, on which manuscripts are being prepared.

Comparison of the features of the genera from which species have been removed and those in which they are now placed will indicate many of the reasons for the new placements. These features are summarised in Linder et al. (1998), Briggs and Johnson (1999) and, for the newly described genera, in Briggs and Johnson (1998). The new classification is, in general, supported by morphological and molecular cladistic studies (Linder et al. in press; Briggs et al. in press). It will also be outlined in the treatment in the *Flora of Australia* and future publications.

† Deceased 1 August 1997.

New combinations and lectotypifications

Types of almost all taxa have been seen and will be cited in the treatment of Restionaceae in the *Flora of Australia*, now in preparation. Types are therefore cited here only for non-Australian species and in those cases where lectotypification is desirable. Unusually large numbers of lectotypifications have been called for, since both male and female plants have often been included in the type material of these dioecious species. Choice of lectotypes has taken into account agreement with the protologue and any comments therein, annotations by the author of the epithet and certainty as to the identity of the specimen. Priority has been given to specimens that exhibit a wide range of the features distinguishing the species and that are represented in several herbaria. Female specimens are often selected since they show more of the features characterising genera; but in some cases male specimens have been selected where they show more distinctive specific features or agree more closely with the protologue. Unless indicated otherwise, types cited here have been seen. Except for the basionym, synonyms are not generally listed, apart from instances where another name for the taxon has been in recent use. An index is provided of new combinations and cited synonyms.

Acion

Acion B.G. Briggs & L.A.S. Johnson, Telopea 7: 353 (1998).

This Tasmanian genus consists of two species that were formerly included in *Restio*. Type species: *A. monocephalum* (R. Br.) B.G. Briggs & L.A.S. Johnson.

Acion hookeri *(D.I. Morris) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio hookeri* D.I. Morris in M.R. Banks et al. (eds), *Aspects Tasmanian Bot., Tribute to Winifred Curtis*: 33 (1991).

Apodasmia

Apodasmia B.G. Briggs & L.A.S. Johnson, Telopea 7: 371 (1998).

A far-flung genus of three or four species: one (undescribed) in Western Australia and one recognised in each of south-eastern Australia (including Tasmania), New Zealand and Chile. *A. chilensis* and *A. similis* show such a close resemblance that their status requires further study. They are, however, maintained here as distinct species. Type species: *A. brownii* (Hook. f.) B.G. Briggs & L.A.S. Johnson, of south-eastern Australia.

Apodasmia chilensis *(Gay) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Schoenodum chilense* Gay, Fl. chilena 6: 152 (1854).

Calopsis chilensis (Gay) Steud., Syn. pl. glum. 2: 258 (1855).

Leptocarpus chilensis (Gay) Mast., Monogr. Phan. 1: 341 (1878).

Type: Chile: ad fluv Rio nigro Arigue, Chili, *Lechler 618* ♀ (P, ex Herb. Steudel). Probable iso: Chile, (K ex P, annotated with the name 'Gay' and originally determined *Schoenodum chilense*).

Apodasmia similis *(Edgar) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Leptocarpus similis* Edgar, New Zealand J. Bot. 6: 468 (1969).

Type: New Zealand: Brooklands lagoon, near mouth of Waimakariri R., north end opposite Spencer Park, *E. Edgar*, 20 Dec 1967 (CHR, not seen).

Baloskion

Baloskion Raf., Flora telluriana 4: 32 (1838).

The name *Baloskion* is adopted for a group of eight eastern Australian species hitherto included in *Restio*. This usage was foreshadowed by Quirico and Briggs (1993). The extensive differences in anatomy between these and the African species that are correctly placed in *Restio* were noted by Cutler (1969). A distinctive feature of *Baloskion*, the adnation of the pedicel to the subtending glume, was clearly illustrated when its first species was described by Labillardière (1806, t. 227). All species require new combinations, the type species of *Baloskion* having only an illegitimate combination within that genus. Type species: *B. dichotomum* Raf., nom. illeg. = *B. tetraphyllum* (Labill.) B.G. Briggs & L.A.S. Johnson.

Baloskion australe *(R. Br.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio australis* R. Br., Prodr.: 245 (1810).

Type citation: (D.) v.v.

Type: Tasmania: In summitate Montis Tabularis [Mt Wellington] prope fl. Derwent, *R. Brown (Bennett 5868)*, Apr. 1804 ♂ (lecto, here selected, BM). Residual syntypes: inter Storm Bay passage, fl. Derwent, *R. Brown*, Apr. 1804 ♀ (BM); Derwent R., *R. Brown* (E); van D[iemens] Land, *R. Brown* ♂, ♀ (K).

Baloskion fimbriatum *(L.A.S. Johnson & O.D. Evans) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio fimbriatus* L.A.S. Johnson & O.D. Evans, Contr. New South Wales Natl Herb. 3: 210 (1963).

Baloskion gracile *(R. Br.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio gracilis* R. Br., Prodr.: 245 (1810).

Baloskion longipes *(L.A.S. Johnson & O.D. Evans) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio longipes* L.A.S. Johnson & O.D. Evans, Contr. New South Wales Natl Herb. 3: 208 (1963).

Baloskion pallens *(R. Br.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio pallens* R. Br., Prodr.: 245 (1810).

Baloskion stenocoleum *(L.A.S. Johnson & O.D. Evans) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio stenocoleus* L.A.S. Johnson & O.D. Evans, Contr. New South Wales Natl Herb. 3: 205 (1963).

Baloskion tenuiculme *(S.T. Blake) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio tenuiculmis* S.T. Blake, Contr. New South Wales Natl Herb. 4: 198 (1963).

Baloskion tetraphyllum *(Labill.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio tetraphyllus* Labill., Nov. Holl. pl. 2: 77 (1806).

Type citation: in capite Van-Diemen.

Type: Tasmania: Van Dièmen, *Labillardière* ♀ (lecto, here selected, P, photo NSW). Possible isolecto: in capite Van-Diemen ♀ (BM). Residual syntypes: Van Diemen, *Labillardière* ♂ (P, on same sheet as lecto); in capite Van-Diemen, *Labillardière* ♂ (BM); Nova Hollandia, *Labillardière* ♂ (K).

Baloskion dichotomum Raf., Flora telluriana 4: 32 (1838), nom. illeg.

Two subspecies are recognised:

Baloskion tetraphyllum *(Labill.) B.G. Briggs & L.A.S. Johnson* **subsp. tetraphyllum**

Baloskion tetraphyllum subsp. **meiostachyum** *(L.A.S. Johnson & O.D. Evans) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio tetraphyllus* subsp. *meiostachyus* L.A.S. Johnson & O.D. Evans, Contr. New South Wales Natl Herb. 3: 220 (1963).

Chaetanthus

Chaetanthus R. Br., Prodr. 251 (1810).

The transfer of two species from *Leptocarpus* enlarges this genus, which occurs in the south of Western Australia; it has hitherto included only a single species. Type species: *C. leptocarpoides* R. Br.

Chaetanthus aristatus *(R. Br.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Leptocarpus aristatus* R. Br., Prodr.: 250 (1810).

Chaetanthus tenellus *(Nees) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio tenellus* Nees in Lehm., Pl. Preiss. 2: 57 (1846).

Leptocarpus tenellus (Nees) F. Muell., Fragm. 8: 90 (1873).

Chordifex

Chordifex B.G. Briggs & L.A.S. Johnson, Telopea 7: 356 (1998).

A genus of 16 species in the south of Western Australia. Ten of the species were previously referred to *Restio*, while five are undescribed. Type species: *C. stenandrus* B.G. Briggs & L.A.S. Johnson.

Chordifex abortivus *(Nees) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio abortivus* Nees in Lehm., Pl. Preiss. 2: 60 (1846).

Chordifex amblycoleus *(F. Muell.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio amblycoleus* F. Muell., Fragm. 8: 65 (1873).

Type citation: In Australia occidentali, *J. Drummond 66.*

Type: Western Australia: *Drummond 66* ♂ (MEL 14733 lecto, here selected; iso K). Residual syntype: *Drummond 66* ♀ (MEL 14730, iso K).

Chordifex chaunocoleus *(F. Muell.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio chaunocoleus* F. Muell., Fragm. 8: 64 (1873).

Type citation: In Australia occidentali, *J. Drummond 948, 949.*

Type: Western Australia: *Drummond 949* ♀ (lecto, here selected, MEL 14744, iso MEL 14742, B, BM, E, K). Residual syntype: *Drummond 948* ♂ (MEL 14743, MEL 14745, iso B, BM, E, K).

Chordifex crispatus *(R. Br.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio crispatus* R. Br., Prodr.: 246 (1810).

Type citation: (M.) v.v.

Type: Western Australia: Bay 1 [Lucky Bay], *R. Brown* ♂ (lecto, here selected BM; iso E, K (two sheets), MEL 14749, 14750, 15016, P). Residual syntype ♀ (BM, mounted on same sheet as lecto).

Chordifex gracilior *(F. Muell. ex Benth.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio gracilior* F. Muell. ex Benth., Fl. austral. 7: 226 (1878). Bentham's publication of Mueller's name (March 1878) predates that of Masters, Monogr. Phan. 1: 297 (June 1878).

Type citation: W. Australia, *Drummond n. 68* and *71*

Type: Western Australia: *Drummond 71* ♂ (lecto, here selected, K; iso MEL 14754; probable iso MEL 14752–3,14755–7). Residual syntype: Swan River, *Drummond 68* ♂ (K).

Chordifex isomorphus *(K. W. Dixon & K. A. Meney) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio isomorphus* K. W. Dixon & K. A. Meney, Nuytsia 9: 91 (1993).

Chordifex laxus *(R. Br.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio laxus* R. Br., Prodr.: 245 (1810) (*Restio*, species number 3), non *R. laxus* R. Br. op. cit. p. 246 (*Restio*, species 12). The latter was renamed *Restio diffusus* Sprengel, Syst. Veg. 1:185 (1824), see below under *Leptocarpus diffusus*.

Type: The type sheet (BM, photo NSW) may include both ♂ and ♀ pieces but this is not certain since the spikelets of males and females are externally similar. The sheet is marked ♂ but the protologue refers to the styles, implying the presence of females. No lectotypification is made here.

Chordifex leucoblepharus *(Gilg) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio leucoblepharus* Gilg, Bot. Jahrb. Syst. 35: 88 (1904).

Chordifex ornatus *(Steud.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio ornatus* Steud., Syn. pl. glumac. 2: 256 (1855).

Chordifex sphacelatus *(R. Br.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio sphacelatus* R. Br., Prodr.: 245 (1810).

Dapsilanthus

Dapsilanthus B.G. Briggs & L.A.S. Johnson, Telopea 7: 369 (1998).

A genus of four species; three in northern Australia and southern New Guinea (two of these also in the Aru Islands), as well as one in south-east Asia (Malaysia, Cambodia, Thailand, Vietnam and the south-eastern Chinese island of Hainan). Type species: *D. elatior* (R. Br.) B.G. Briggs & L.A.S. Johnson.

Dapsilanthus disjunctus *(Mast.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Leptocarpus disjunctus* Mast., J. Linn. Soc. Bot. 17: 344 (1879).

Type citation: in insula 'Phu', Cochin China, *Godefroy-Lebœuf 928*.

Type: Vietnam: Cochin-China, village de Bac, Ile de Phu Quoc, *Godefroy-Lebœuf 928*, Sep [18]78 ♀ (holo K). (The protologue describes the species as monoecious; it is in general dioecious. A possible isotype (P) is accompanied by the note 'lower spikelets ♀ upper ♂'.) We observed only ♀ flowers.

Dapsilanthus ramosus *(R. Br.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Leptocarpus ramosus* R. Br., Prodr.: 250 (1810).

Type citation: (T.) B. v.s.

Type: Queensland: Endeavour R., *Banks & Solander*, 1770 ♀ (lecto, here selected, BM; iso B, BRI, MEL 14439 p.p., NSW 78873). Residual syntype ♂ (BM, on same sheet as lectotype; iso MEL 14439 p.p., NSW 147064, P).

Dapsilanthus spathaceus *(R. Br.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Leptocarpus spathaceus* R. Br., Prodr.: 250 (1810).

Type citation: (T.) v.v.

Type: northern Australia: Iter Austral., *R. Brown (Bennett No. 5874p.p.)*, 1802–5 ♀ (lecto, here selected, BM; iso BRI, K (2 sheets); probable iso MEL 15103 p.p. Residual syntype: Iter Austral., *R. Brown (Bennett No. 5874p.p.)*, 1802–5 ♂ (BM, iso BRI, K; probable iso MEL 15103 p.p.).

Leptocarpus schultzii Benth., Fl. austral. 7: 237 (1878).

Leptocarpus barbatus K. Bakker, Fl. Males. ser. I, 5(4): 419 (1957).

Type: Aru Islands: P. Trangan, Cape Meroor, *Buwalda 5531*, 9 July 1938 ♂ (holo L; iso BO, GH, K).

Desmocladus

Desmocladus Nees in Lehm., Pl. Preiss. 2: 56 (1846).

The name adopted for this genus, although published in 1846, was not taken into use until recently (Meney, Pate & Dixon 1996; Linder, Briggs & Johnson 1998; Briggs & Johnson 1999). The 15 species occur in the south of Western Australia, with one species also in Eyre Peninsula, South Australia. Except for *D. glomeratus* K.W. Dixon & K.A. Meney and *D. asper* (see below), all the described species were previously included in *Loxocarya* R. Br. which has markedly different features and is typified by *L. cinerea* R. Br. Nine of the species are undescribed. The type species is among those requiring a new combination; its previous combination under *Desmocladus* being illegitimate. Type species: *D. brunonianus* Nees, nom. illeg. = *D. fasciculatus* (R. Br.) B.G. Briggs & L.A.S. Johnson.

Desmocladus asper *(Nees) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Caloroplus asper* Nees in Lehm., Pl. Preiss. 2: 67 (1846).

Type citation: ... haud longe ab ore maris (Perth) m. Septembri a. 1839 [*Preiss 1716 p.p.*] et ... praedia rustica v. cll. Barker et Lennard m. April a. 1840 [*Preiss 1694*].

Type: Western Australia: *Preiss 1716 p.p.* ♂ (lecto, here selected, excluding material of *Hypolaena pubescens* under this number, LD; iso MEL 14861 p.p., MO, P). Residual syntype *Preiss 1694* ♂ (LD, MEL 14861p.p., BM, K, MO).

Desmocladus fasciculatus *(R. Br.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio fasciculatus* R. Br., Prodr.: 247 (1810).

Desmocladus brunonianus Nees in Lehm., Pl. Preiss. 2: 56 (1846), nom. illeg., based on *Restio fasciculatus* R. Br.

Loxocarya fasciculata (R. Br.) Benth., Fl. austral. 7: 242 (1878).

Desmocladus flexuosus *(R. Br.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio flexuosus* R. Br., Prodr.: 247 (1810).

Loxocarya flexuosa (R. Br.) Benth., Fl. austral. 7: 243 (1878).

Type citation: (M.) v.v.

Type: Western Australia: King George Sound, *R. Brown 1802–5 (Bennett No. 5849 p.p.)* ♂ (lecto, here selected, BM, the lectotype consists of the fertile male specimens on the sheet, excluding the vegetative piece on right of sheet which may be an allied species of *Desmocladus*, and also the central specimen in the lower half of the sheet which is *Empodisma gracilliuum* (F. Muell.) L.A.S. Johnson & D.F. Cutler.; isolecto BM).

Desmocladus myriocladus *(Gilg) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Loxocarya myriocladа* Gilg, Bot. Jahrb. Syst. 35: 90 (1904).

Type citation: in distr. Avon pr. Tammin ... (*D. 5070*); in distr. Eyre pr. Graspatch ... flor. m. Nov. (*D. 5296*).

Type: Western Australia: Avon, Tammin, *L. Diels 5070*, 24 Nov. 1901 ♂ (lecto, here selected, B; iso NSW). The residual syntype (examined in B) is an allied undescribed species of *Desmocladus*. The lectotypification maintains the name for the more widespread and abundant species.

Desmocladus virgatus *(Benth.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Loxocarya virgata* Benth., Fl. austral. 7: 242 (1878).

Type citation: W. Australia, *Drummond, n. 74* and *113*. 'Another 113 however of the same collector appears to be the male of some *Hypolaena*' (Bentham).

Type: Western Australia: Swan River, *Drummond 113p.p.* ♂ (lecto, here selected, annotated by Bentham as *Loxocarya virgata*, K, photo NSW). Residual syntype: Swan River, *Drummond 74* ♂ (K).

Dielsia

Dielsia Gilg, Bot. Jahrb. Syst. 35: 88 (1904).

A distinctive monotypic genus of the south of Western Australia. The type species requires a valid combination.

Dielsia stenostachya *(W. Fitzg.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio stenostachyus* W. Fitzg., Proc. Linn. Soc. New South Wales 28: 108 (1903).

Type citation: Burswood; in wet spots (♀; in March 1900) near Causeway, Perth (♂; April 1901; *W.V. Fitzgerald*).

Type: Western Australia: Causeway near Perth, *W.V. Fitzgerald*, April 1901 ♂ (lecto, here selected, NSW 91587; iso PERTH). Residual syntype: Burswood, E of Causeway, Perth, *W.V. Fitzgerald*, March 1901 ♀ (NSW 91959, iso PERTH) [this appears to be Fitzgerald's ♀ syntype, despite the discrepancy in date].

Dielsia cyguorum Gilg, Bot. Jahrb. Syst. 35: 88 (1904), nom. illeg.

Syntypes: Western Australia: in distr. Darling pr. Swan River (Bayswater), *Pritzel 304*, May 1901 ♂ (B, iso AD, E, K, MO, NSW, PERTH [labelled *340*], US); *Diels 28166* 13 May 1901 ♀ (B, iso K).

Harperia

Harperia W. Fitzg., J. W. Austral. Natural. Hist. Soc. 1: 34 (1904).

A genus of four species, one of them undescribed, in the south of Western Australia. Type species: *H. lateriflora* W.V. Fitzg.

Harperia confertospicatus *(Steud.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Restio confertospicatus* Steud., Syn. pl. glumac. 2: 256 (1855).

Hypolaena

Hypolaena R. Br., Prodr.: 251 (1810).

A genus of eight species, three of them undescribed, in the south of Western Australia, one of them (*H. fastigiata* R. Br.) also occurring in eastern Australia from southern Queensland to South Australia and Tasmania. Lectotype species: *H. fastigiata* R. Br.

Hypolaena humilis *(Gilg) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Leptocarpus humilis* Gilg, Bot. Jahrb. Syst. (1904: 89).

Type citation: in distr. Stirling pr. Cranbrook ... fl. m. Sept. (*D. 4433).*

Type: Western Australia: Cranbrook, *Diels 4433b*, 24.9.1901 ♀ (lecto, here selected, B; iso P). Residual syntype: Cranbrook, *Diels 4433a*, 24.9.1901 ♂ (B; iso P).

Lepidobolus

Lepidobolus Nees in Lehm., Pl. Preiss. 2: 66 (1846).

A genus of eight species, two of them undescribed; one species including three subspecies (one undescribed). Seven species occur in the south of Western Australia and one (*H. drapetocoleus* F. Muell.) in the east of South Australia and in western Victoria. Type species: *L. preissianus* Nees.

Lepidobolus preissianus Nees in Lehm., Pl. Preiss 2: 66, (1846).

Note on typification: Preiss numbers *1755* and *1756 ex parte* are given in the protologue as syntypes of the species and *Preiss 1757* as the type of var. *volubilis*. By contrast, Nees (in the index of collections) in Lehm., Pl. Preiss. 2: 408 (1846) and Masters, Monogr. Phan. 1: 347 (1878) list *Preiss 1757* as an example of the species and *Preiss 1756* as var. *volubilis*. The features of the specimens and Preiss's annotations of the sheets indicate that the collection numbers cited in the protologue are correct.

Type citation: In arenosis clivuli Bellevue ad flumen Cygnorum m. Augusto a 1839 et in ... destrictus [districtus] York, m. Septembri a. 1839 ♂, ♀ *Preiss No. 1755 et 1756 ex parte.*

Type: Western Australia: Bellevue ... *Preiss 1755* p.p. ♀ (lecto, here selected, LD; iso MEL 14716 p.p.). Most sheets include ♂ and ♀ material (isolecto MEL 14711, ♀ material of MEL 14712–4 p.p.). Residual syntypes: *Preiss 1756* ♂, ♀ (LD; iso MEL 14714); ♂ material of *Preiss 1755* (MEL 14712–4, 14716 p.p.).

Two subspecies are recognised:

Lepidobolus preissianus subsp. **preissianus**

Lepidobolus preissianus Nees var. *preissianus*

Lepidobolus preissianus subsp. **volubilis** *(Nees) B.G. Briggs & L.A.S. Johnson*, **comb. et stat. nov.**

Basionym: *Lepidobolus preissianus* Nees var. β *volubilis* Nees in Lehm., Pl. Preiss. 2: 66 (1846).

Type citation: In districtu York cum *No. 1756, Herb. Preiss No. 1757.*

Type: Western Australia: *Preiss 1757*, 10 Sep [18]39 ♂ (LD; iso MEL 14715).

Leptocarpus

Leptocarpus R. Br., Prodr.: 250 (1810: 250), (nom. cons.)

Currently the lectotype species of *Leptocarpus* is *L. aristatus* R. Br. but it is our intention to seek conservation of a new type to avoid change to the name of the most widespread of the species and to maintain the use of *Chaetanthus* R. Br. Our studies have led us to restrict *Leptocarpus*, if typified by *L. tenax* (Labill.) R. Br., to three species. All occur in the south of Western Australia, with *L. tenax* occurring also in eastern Australia from southern Queensland to South Australia and Tasmania.

Leptocarpus diffusus (Spreng.) B.G. Briggs & L.A.S. Johnson, **comb. nov.**

Basionym: *Restio diffusus* Spreng., Syst. Veg. 1: 185 (1825) (*Restio laxus* R. Br., Prodr.: 246 (1810) (*Restio* species number 12) non R. Br., Prodr.: 245 (1810) (*Restio* species number 3)).

Type citation: (M.) v.v.

Type: Western Australia: 'King George III^{d} Sd', *R. Brown* ♂ (BM; iso P). The BM sheet bears labels 'King George III^{d} Sd' and 'Port Jackson', the latter stuck to a slip labelled '12' and 'Bennett 5860', both locality labels with *'Restio laxus'* in Brown's hand. The material appears to represent a single collection of this Western Australian species, and not to require lectotypification.

Loxocarya

Loxocarya R. Br., Prodr.: 249 (1810).

A genus of five species, one of them undescribed, in the south of Western Australia. As noted above, five species previously referred to *Loxocarya* (although originally described under various genera) are now transferred to *Desmocladus*. Type species: *L. cinerea* R. Br.

Loxocarya striata *(F. Muell.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Megalotheca striata* F. Muell., Fragm. 8: 99 (1873).

[*Restio megalotheca* F. Muell. ex Benth., Fl. austral. 7: 222 (1878), nom. illeg.]

Type citation: In Australiae plagis occidentalibus; *J. Drummond.*

Type: Western Australia: *Drummond s.n.* ♀ (lecto, here selected, MEL 14774; iso K). Residual syntypes: *Drummond 186* ♀ (MEL 14776, 14778), *450* (MEL 14773, 14775). Probable isotypes: *Drummond 950*, 1843 ♂ (BM, E), *Drummond 951*, 1843 ♀ (GH, P), Swan R., *Drummond 100* ♂ (K), *Drummond 103* ♂ (E) ♀ (K).

Meeboldina

Meeboldina Suess., Boissiera 7: 20 (1943).

This genus, of the south of Western Australia, was previously regarded as monotypic but is now enlarged by the transfer of four species from *Leptocarpus*. A further six species remain to be described. Type species: *M. denmarkica* Suess.

Meeboldina cana *(Nees) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Leptocarpus canus* Nees, *Ann. Mag. Nat. Hist.* 6: 50 (1841).

Type citation: ad Flumen Cygnorum lectae.

Type: *Drummond 1705* ex parte ♀ (LD; iso CGE). Residual syntype: *Drummond 1862* ♂ (LD; iso K).

L. canus was also published by Nees in Lehm. Pl. Preiss. 2: 64 (1846) with the citation 'L. et N.' [Lindl. & Nees] but with no reference to the earlier publication. The original publication of the basionym had Nees as author but was communicated to the journal by Lindley.

Meeboldina coangustata *(Nees) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Leptocarpus coangustatus* Nees in Lehm., Pl. Preiss. 2: 65 (1846).

Type citation: ♂ In depressis uliginosis prope Halfwayhouse, Darling's-range, m. Septembri a. 1839 ..., *Preiss 1708*. ♀ In uliginosis planitiei ad fluvium Cygnorum supra oppidulum Perth, m. Octobri a. 1839 ... *Preiss 1706. Drummond* in Herb. Lindl.

Type: Western Australia: ad fluvium Cygnorum supra oppidulum Perth, *Preiss 1706* ♀ (lecto, here selected, LD; iso MEL 14416, P). Residual syntypes: prope Halfwayhouse, Darling's-range, *Preiss 1708* (LD, B, P); Swan R., *Drummond*, 1839 ♀ (K).

Meeboldina crassipes *(J.S. Pate & K.A. Meney) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Leptocarpus crassipes* J.S. Pate & K.A. Meney, Telopea 6: 658 (1996).

Meeboldina scariosa (R. Br.) *B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Leptocarpus scariosus* R. Br., Prodr.: 250 (1810).

Sporadanthus

Sporadanthus F. Muell., Trans. & Proc. New Zealand Inst. 6: 389 (1874).

This was considered a monotypic New Zealand endemic until the relationship was recognised between *S. traversii* and the Australian species of *Lepyrodia* 'Group B' of Johnson and Evans (1963). *S. strictus* and one undescribed species occur in the south of Western Australia but the other five species now transferred occur in eastern Australia from southern Queensland to Tasmania and western Victoria. Type species: *S. traversii* (F. Muell.) F. Muell. ex Kirk.

Sporadanthus caudatus *(L.A.S. Johnson & O.D. Evans) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Lepyrodia caudata* L.A.S. Johnson & O.D. Evans, Contr. New South Wales Natl Herb. 3: 226 (1963).

Sporadanthus gracilis *(R. Br.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Lepyrodia gracilis* R. Br., Prodr.: 247 (1810).

Sporadanthus interruptus *(F. Muell.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Lepyrodia interrupta* F. Muell., Fragm. 8: 74 (1873).

Type citation: In insula Moreton's Island; *F.M.*

Type: Queensland: Moreton Island, *F. Mueller*, 1855 ♀ (lectotype, here selected, MEL 707408, iso MEL 707409–707411, BM, K). Residual syntype: ♂ (K, P).

Sporadanthus strictus *(R. Br.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Lepyrodia stricta* R. Br., Prodr.: 248 (1810).

Sporadanthus tasmanicus *(Hook. f.) B.G. Briggs & L.A.S. Johnson*, **comb. nov.**

Basionym: *Lepyrodia tasmanica* Hook. f., Fl. Tasm. 2: 72 (1858).

Type citation: *Gunn, 960, 1393.*

Type: Tasmania: Detention R. nr Rocky Cape, *Gunn 960*, 16.12.[18]36 ♀ (lecto, here selected, K). Residual syntypes: Detention R., *Gunn 960*, 16.12.[18]36 ♂ (K); R.C. *Gunn 960*, 1837 ♂ (K); *Gunn 960* (CGE ex Lindley); Tasmania, Lake St Clair, *Gunn 1393*, 7.1.[18]41 ♂ (K).

Acknowledgments

Many people assisted in the studies that led to the present paper. Thanks are due especially to Carolyn Porter, Siegfried Krauss, Anna-Louise Quirico, Barbara Wiecek and Louisa Murray. Karen Wilson assisted with photographs of specimens in several herbaria. The opportunity to examine specimens on loan or in other herbaria is gratefully acknowledged, as is the assistance of Anna Hallett and Miguel Garcia of the Royal Botanic Gardens Sydney Library. Grants from the Australian Biological Resources Study provided valuable technical help.

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Index to new combinations, basionyms and cited synonyms

New combinations are printed in **boldface**; synonyms are printed in *italics*.

2.5–3 cm long, 1.2–1.5 cm across, dehiscing into 4, sometimes 5 valves; sepals persistent. Seeds 2–2.5 cm long including the wing.

DISTRIBUTION. Malesia (the Malay Peninsula).

Malay Peninsula. Perak, *Scortechini 1982* (L, SING), *Wray 3766* (SING); Kuala Kangsar, *Kochummen FRI 2461* (L); Bintang Hijau F. R., *Chan FRI 13328* (L, SING); nr. Fort Tapong, *Whitmore FRI 15749* (L); G. Babu, *Selvaraj FRI 6555* (L). Trengganu, Bt. Jebak Puyoh, Ulu Besut, *Cockburn FRI 8335* (L). Negri Sembilan, Nilai Jindaram Estate, *Md. Shah 70* (SING). Pahang, Sg. Telom, Bt. Cheraya, *Sohadi FRI 14731* (L, SING); Taman Negara, *van Balgooy 2577* (L). Kelantan, G. Babong, *Soepadmo & Mahmud 1172* (L). Malacca, *A. C. Maingay 192* (L, isotype).

VERNACULAR NAMES: *titup, titup tiup, tiup, damak.*

ECOLOGY. In primary forest and dipterocarp forest, on ridge-top or on hill side; alt. 300–400 m. Fl.: Apr.–May, fr.: July–Jan.

11. Gordonia marginata (Korth.) Endl. *ex* Walp., Repert. 5 (1845) 134; Merr., J. Str. Br. Roy. As. Soc. spec. no. (1921) 390; Masamune, Enum. Phan. Born. (1942). 472. Fig. 11

Closaschima marginata Korth., Kruidk. (1842) 141 (*incl.* var. *dasyophthalma* Korth.); Walp., op. cit. 1 (1842) 375.

Laplacea marginata (Korth.) Choisy, Mém. Soc, Phys. Hist. Nat. Genève 14 (1855) 148; Miq., Fl. Ind. Bat. 2 (1857) 490.

Haemocharis marginata (Korth.) O. Ktze, Rev. Gen. Pl. (1891) 62; Burk., op. cit., 153.

Tree, 25–40 m tall, buttressed. Bark grey, smooth, scaling off in large pieces; living bark beefy red, sap wood reddish white. Young twigs reddish brown, glabrous. Leaf-blades thin coriaceous, obovate or narrowly obovate, sometimes rhomboid, obtuse or slightly emarginate, base cuneate, 4–7 (-9) cm long, 2–3 (-3.5) cm wide; margins for the most part undulate or remotely crenulate, entire near the base; nerves 5–7 pairs, slightly impressed above, inconspicuous below, glabrous on both surfaces, except the lower pilose midrib; petioles stout, 2–3 mm long. Flowers in upper axils or subterminal, solitary or 2–3 in clusters; peduncles very short, 1–3 mm long; bracteoles, bracts and sepals forming an involucre about 5–8 mm high, silvery puberulous on the back, increasing in size from the lower bracts (broadly ovate, 1–1.5 mm long) to the upper sepals (broadly ovate or subrounded, 4–5 mm long). Corolla 2–2.5 cm across, pale yellow; petals 5, obcordate to subrounded, 8–10 mm long, membranous, silky externally except the margins which are thinner and glabrous; petals briefly joined at the base and adnate to the filaments. Androecium 4–5 mm long, the filaments united below. Gynoecium 4–6 mm long; columnar, 1.5–2.5 mm long, ridged, the upper portion separating into 5 branches each bearing a terminal stigma; ovary ovoid, velutinous, tapering above into the style. Capsule ellipsoid-cylindric, 2–2.5 cm long, 5-grooved, velutinous along the grooves; sepals persistent. Seeds 1–1.4 cm long including the wing.

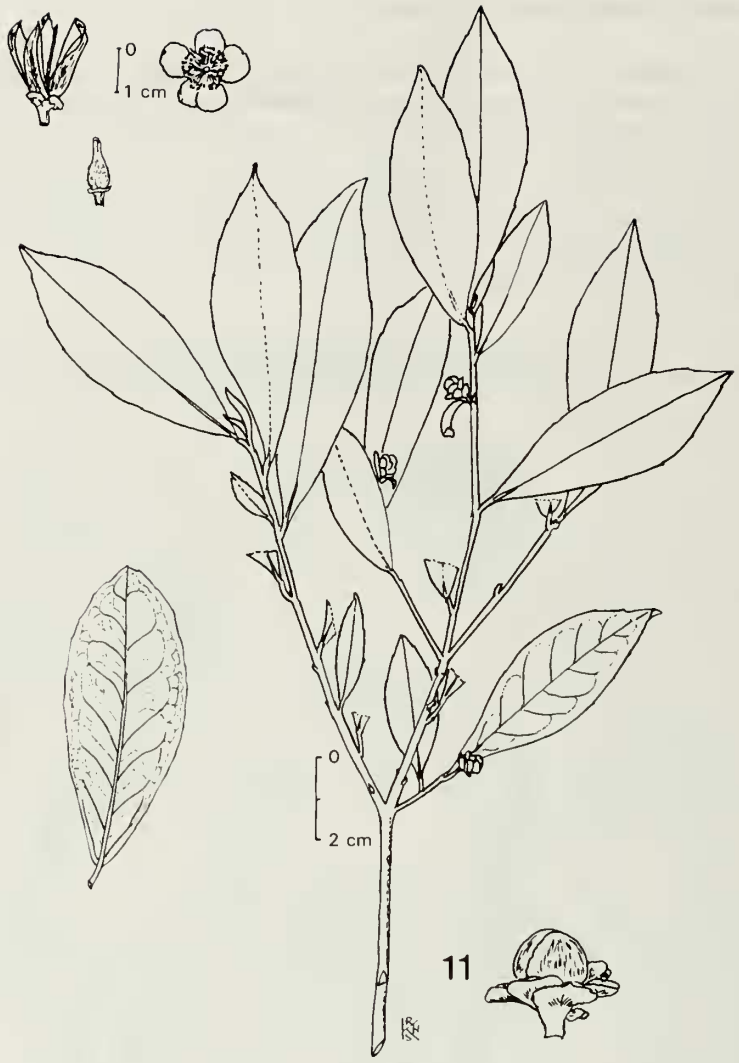

Fig. 11. *Gordonia marginata* (Korth.) Endl. ex Walp.
Kalimantan, *Korthals s.n.* (Herb. Lugd. Bat. No *925, 250-547); Kostermans 6702* (fl., fr.).

labelled as *Closaschima* (or as *Closaschyma*) *marginata*, *C. obovata, C. lanceolata*, and *C. marginata* var. *dasyopathalma*, all in Korthals' handwriting. Only the first name was published. These specimens bear small flower buds or are sterile. Among them there is only a single fruit (Herb. Lugd. Bat. 908, 249–238). The description presented here is largely based on two collections of Dr. Kostermans.

12. Gordonia multinervis King, J. As. soc. Bengal 59, 2 (1890) 205; Burk., J. Str. Br. Roy. As. Soc. 76 (1917) 154, *f. 11*; Ridl., Fl. Mal. Pen. 1 (1922) 203; H. Keng in Ng, Tr. Fl. Mal. 3 (1978) 286. Fig. 12

Gordonia concentricicatrix Burk., op cit., 153, *f. 10 & 11*, op. cit., 78 (1918)

49, pl. 3; Ridl., l.c.; H. Keng, op. cit., 285. **Syn. nov.**

Small to large tree, 10–30 m tall. Bark grey, smooth or reddish brown and with large loose scales in several layers, scallop-marked. Young twigs glabrous except near the tip which is puberulous. Leaf-blades membranous or thin coriaceous, obovate-spathulate, apex rounded, mucronate, or shortly acuminate, base gradually attenuate and often narrowly winged below, varying from 10–15 cm long, 2–5.5 cm wide ('*concentricicatrix*') to 12–20 cm long, 6–8.5 (-10) cm wide ('*multinervis*'), the upper two-thirds crenate, subentire or entire below; glabrous on both surfaces; nerves 8–18 pairs (often with smaller, less conspicuous veins in between), very faint above, barely visible beneath, fused near margin and forming intramarginal reticulations; midrib sulcate above; petiole thickened, 2–5 mm long, glabrescent.

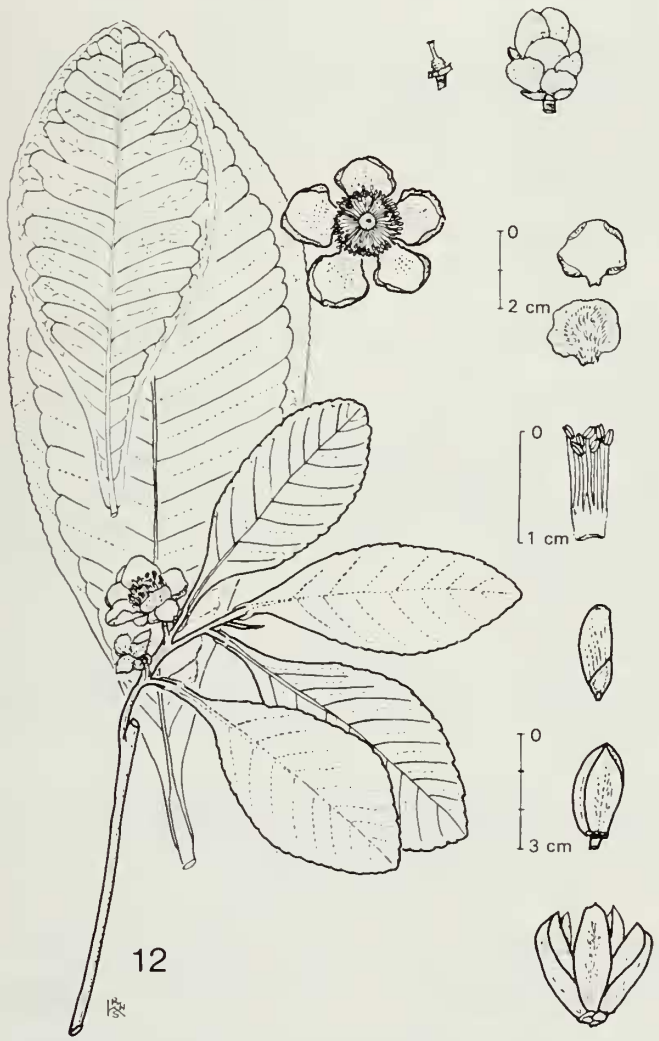

Fig. 12. *Gordonia multinervis* King
Malaya, *Watson CF 878 & Abdul Rawi CF 878* (fl. & fr.); *Scortechini 1968* (large leaf).

Flowers axillary, solitary; peduncles short, 2–5 (-10) mm long, stout. Bracts 2–3, broadly deltoid, 3–5 mm long. Sepals 5–6, broadly ovate to suborbicular, thin coriaceous, about 1 cm long and wide, greyish silky externally. Corolla 2–3.5 cm across, yellow; petals 5, broadly obovate or suborbicular, 1–1.7 cm long and wide, thin coriaceous, greyish silky externally (indistinguishable from sepals from without except by larger size and position) briefly clawed and joined at base, and adnate to the filaments. Androecium 1.2–1.5 cm long, the filaments united below. Gynoecium 1–1.2 cm long; style solitary, columnar, 4–5 mm long, hispid, the tip discoid, 5-lobed into 5 stigmas; ovary ovoid, 3–4 mm long, densely covered with sericeous hairs. Capsule bluntly 5 angulate, 3–4 cm long, 5-valved; sepals persistent. Seeds 2–2.5 cm long including the wing.

DISTRIBUTION. Malesia (the Malay Peninsula).

Malay Peninsula. Kelantan, G. Stong, *Whitmore FRI 12490* (L); Kuala Kerbat, *Whitmore FRI 20244* (L). Perak, *Scortechini 1968* (isotype, SING). Pahang, Chini F.R., *Cockburn FRI 11076* (L). Selangor, Rantau Panjang, *Watson CF 878 & Abdul Rawi CF 878* (Type of *G. concentricicatrix* Burk., SING); Gading F.R., *Loh FRI 13397* (L). Negri Sembilan, G. Angsi, *Loh FRI 17314* (L). Johore, Bukit Tingan Laut, *Corner SFN 37064* (L); Tenggaroh F.R., *Ogata KEP 105152* (L), G. Ledang, *Whitmore FRI 12303* (L). Singapore, Bukit Timah, *Corner SFN 36435* (L); MacRitchie Res., *Sinclair SFN 40231* (L).

ECOLOGY. In lowland forest, on sandstone ridge or on hill side; alt. 10–800 m. Fl.: Apr.–June, fr.: July–Oct.

VERNACULAR NAMES: *kelak merah. samak pulut. samak samak.*

NOTE. This species, as observed by Steenis (Blumea 12 (1964) 319), is closely allied to *G. oblongifolia* of Sumatra; both are characterized by the oblong or obovate leaves with decurrent winged base, by the thin leathery petals with silky outer surface, hardly distinguishable from the sepals before anthesis, and by the single style with an enlarged discoid tip. It can be easily separated from the latter, however, by its smaller leaves with more numerous nerves and more distinct submarginal reticulation and by its much smaller flowers and fruits.

G. concentricicatrix Burk. was described from a small-leaved form of the species. Of this the type specimen is a mixture of two specimens collected by two different persons at the interval of one year but were mounted on one sheet and given the same collection number.

The following two Bornean specimens are probably referable to this species: E. Borneo, Mt. Palimasan alt. 500 m, *Kostermans 13097* (L), and N. Borneo, Beaufort Hill, alt. 350 m, *Lajangah 44532* (L).

13. Gordonia oblongifolia (Miq.) Steenis, Blumea 12 (1964) 319. Fig. 13

Ploiarium? oblongifolium Miq., Fl. Ind. Bat. Suppl. (1861) 483.

Tree, 13 m tall. Branches stout, glabrous. Leaf-blades thin coriaceous, elliptic-oblong, narrowly oblong or oblanceolate-spathulate, apex broadly acute or obtuse, base acute or attenuate, decurrent and narrowly winged, 14–20 (-28) cm long, 6.5–7

(-10) cm wide; margin finely crenulate-serrulate for the most part, nearly entire toward the base; nerves 11–14 pairs, intermingled with less distinct ones and intricately interlocked near the margin; glabrous on both surfaces; petiole 3–5 mm long, thickened. Flowers solitary, in upper leaf-axils, sometimes several together near the top of a top branchlet; peduncle 1.5–2 cm long, very stout. Bracts and bracteoles 2–3, caducous. Sepals 5, broadly ovate, 1.8–2.2 cm long, thick coriaceous, densely sericeous externally, yellowish brown. Corolla unknown. Gynoecium about 1.8 cm long; style about 1.4 cm long, thinly hispid, minutely 5-lobed at the end; ovary ovoid, about 4 mm long, sulcate, densely sericeous. Capsule cylindric, 5-angulate, about 5 cm long; calyx persistent. Seed 3.5 cm long including the wing.

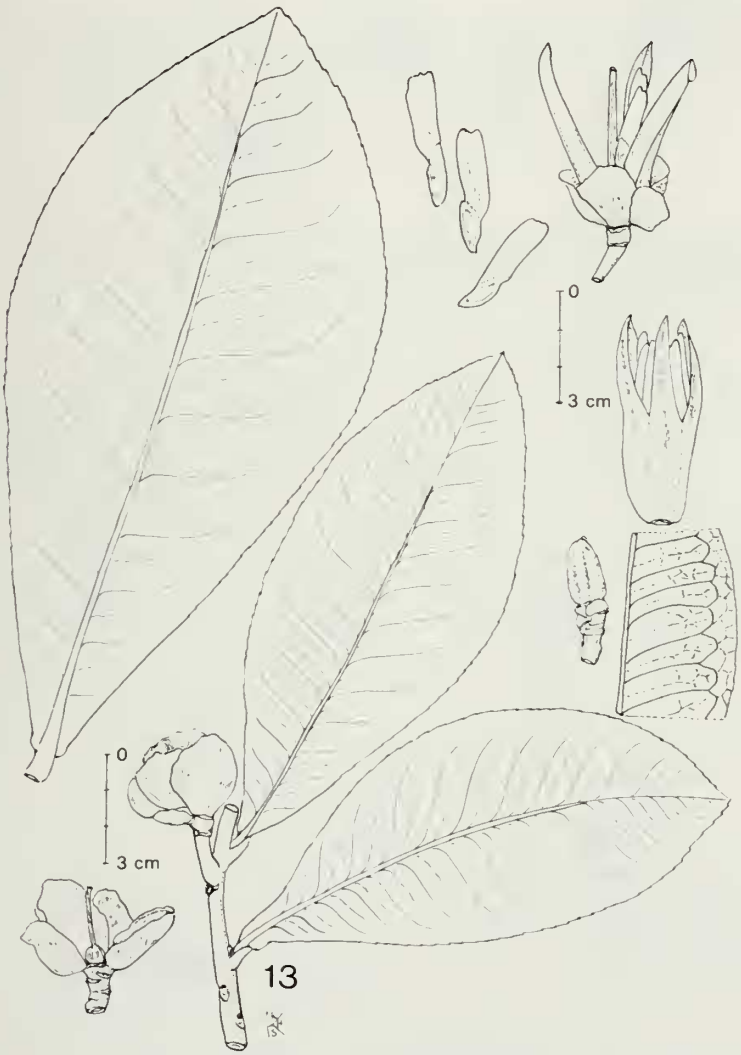

Fig. 13. *Gordonia oblongifolia* (Miq.) Steenis
Sumatra, Neth. Ind. For. Serv. *2794* (fl.), *9571* (fr.).

DISTRIBUTION. Malesia (Central & W. Sumatra).

Sumatra. Benkoelen, Lebong, Neth. Ind. For. Serv. *2794, 9571* (L); Res. Lum, Oud. Agam, *Olivier 16* (B), *Neth. Ind. For. Serv. 2946* (L). Res. Tapanoeli, Sibolga, *Neth. Ind. For. Serv. 3780* (L). Fort de Kock, nr. Bukit Silit, *Teysmann HB 668* (L, type of *Ploiarium oblongifolium* Miq.)

ECOLOGY. In primary forest; alt. 50–1300 m. Fl.: Jan. (one collection), fr.: Dec. (one collection).

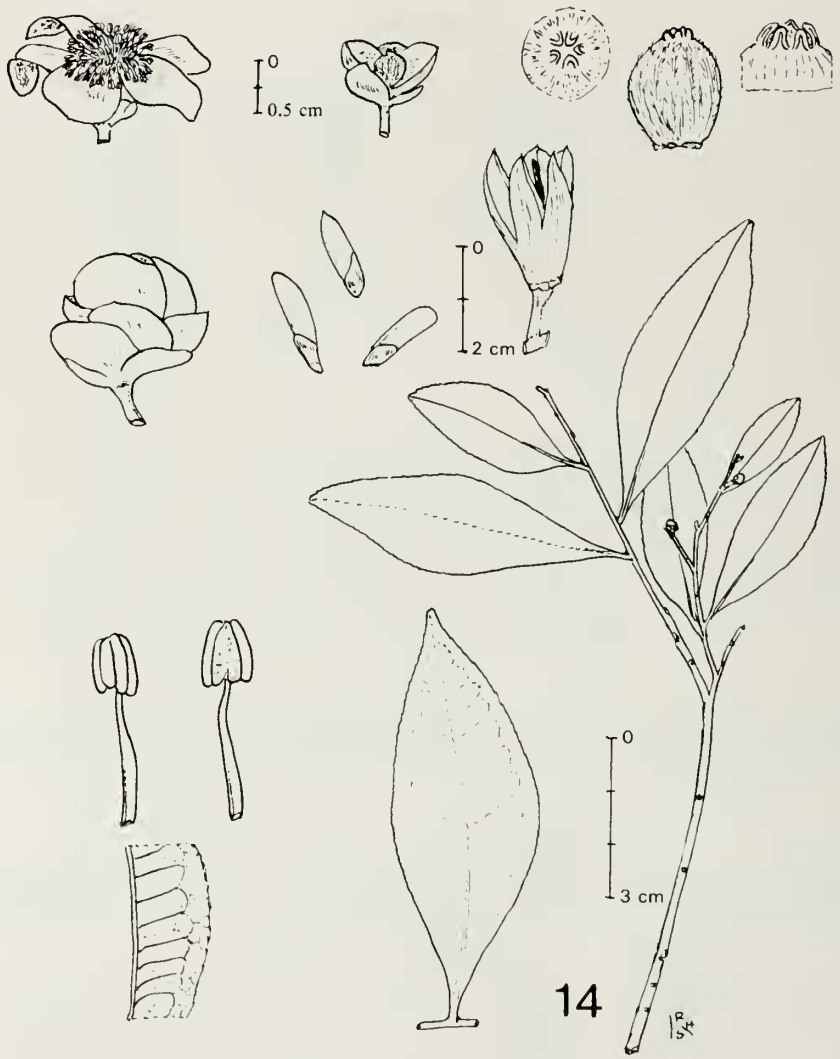

Fig. 14. *Gordonia ovalis* (Korth.) Korth. ex Walp.
Sumatra, *Korthals, s.n.* (Herb. Lugd. Bat. No. *908, 249-324,* fr); *Jacobs 8311* (fl.).

VERNACULAR NAMES: *kajoe patjat, ubar lilim, djirok bantjoh* (Sumatra).

NOTE. The original description of *Ploiarium oblongifolium* Miq. was based on a sterile specimen (*Teysmann HB 668*). Miquel therefore was uncertain about the generic status. In fertile material, van Steenis found the style bearing minute stigmas, and therefore tranferred it to *Gordonia*. A well-preserved fruiting specimen (*Neth. Ind. For. Serv. bb. 9571*) further confirms this transfer.

This species, although with large elliptic-oblong leaves, showy flowers and big fruits, is poorly represented in herbaria. I failed to find any Sumatran specimens collected later than 1925 referable to this plant.

14. Gordonia ovalis (Korth.) ex Walp. Repert. 5 (1845) 134 Fig. 14

Closaschima ovalis Korth., Kruidk. (1842) 140, *t, 28.*

Laplacea ovalis (Korth.) Choisy, Mém. Soc. Phys. Genève 14 (1855) 148; Melch. in E. & P., Pflanzenfam. ed. 2, 21 (1925) 136.

Haemocharis ovalis (Korth.) O. Ktze, Rev. Gen. 1 (1891) 63; Burk. J. Str. Roy. As. Soc. 76 (1917) 158.

Laplacea aromatica Miq., Fl. Ind. Bat. Suppl. (1861) 482, (*incl.* var. *minor*, var. *longifolia*), Mus. Bot. Lugd. Bat. 4 (1869) 114; Melch. in E. & P. Pflanzenfam. ed. 2, 21 (1925) 136. **Syn. nov.**

Haemocharis aromatica (Miq.) Szyszyl. in E. & P. Pflanzenfam. 3, 6 (1893) 185 (*excl.* syn. *L. semierrata* Miq.); Burk., op. cit., 151. **Syn. nov.**

Laplacea subintegerrima Miq. Fl. Ind. Bat. Suppl. (1861) 483. **Syn. nov.**

Haemocharis subintegerrima (Miq.) Burk., op. cit., 155. **Syn. nov.**

Tree, 10–25 m tall. Bark grey, peeling off in pieces. Young branches slender, thinly covered with short silky hairs; older branches puberulent or glabrous. Leaf-blades thin or thick membranous, narrowly elliptic, narrowly ovate or obovate, sometimes slightly asymmetrical; apex acute, acuminate or subcaudate, sometimes obtuse or rounded; base attenuate or cuneate, 4.5–9 (-14.5) cm long, 2–2.5 (-4) cm; wide; margin finely serrulate-crenuate; nerves 10–13 pairs, faint on both surfaces, shining dark green and glabrous above, light green, slightly glaucous and sericeous below; petiole very short, 2–3 mm long. Flowers usually in upper axils, solitary, peduncles 1–3 mm long, sericeous. Bracts and sepals 7–8, silver puberulous externally, increasing in size from the lower bracts (deltoid or reniform, 1–1.2 mm long) to upper sepals (reniform or subrounded, 2–3 mm long). Corolla 1.2–2.5 cm across, white (*fide* Kostermans & Anta); petals usually 5, oblong, broadly oblong to suborbicular, 5–8 mm long, thin coriaceous, silvery puberulous on the external surface except the margins which are thin and glabrous, briefly joined below. Androecium 4–5 mm long, the filaments in several whorls, united below and adnate to the corolla. Gynoecium ovoid to globose, 2–2.5 mm across, sericeous; style absent, only 5 very short, V-shaped protrusions (less than 1 mm long) representing the stigmas; ovary shallowly longitudinally ridged. Capsule 2–2.5 cm long, ovoid or narrowly ovoid, thinly puberulous, dehiscing into 5 valves; sepals caducous fully ripe fruit; seeds 1.5–2 cm long including the narrow wing.

DISTRIBUTION. Malesia (Sumatra).

Sumatra. W. Sumatra, *Korthals s.n. Herb. Lugd. Bat. 908, 249–247, -248, -249, -284, -305, -311, -312, -313, -314, -315, -318, -319, -320, -321, -322* (holotype of *Closaschima ovalis* Korth., L.), *-323, -324, -474* (L); Pariamen, W. Sumatra, *Diepenhorst H.B. 3081* (isotype of *Laplacea aromatica* Miq., L), *2184* (lectotype of *L. aromatica* var. *minor* Miq.), *2492* (lectotype of *L. aromatica* var longifolia Miq., (L). Lampung, NW. of Kota Agung, *Jacobs 8311, 8439* (BO, L). Asahan, *Krukoff 4224, 4235* (BO), *Rahmat Si Boeea 9346* (L). Bangka Lubok Besar, *Kostermans & Anta 540* (BO, L). Palembang, *Neth. Ind. For. Serv. bb. 938, 32002, 31720* (L), *Teysmann H.B. 3969* (holotype of *Laplacea subintegerrima* Miq., L).

ECOLOGY. In primary forest, on 'red' soil. Alt. 20–500 m. Fl.: Apr, May & Sept., fr.: Apr.–May, & July.

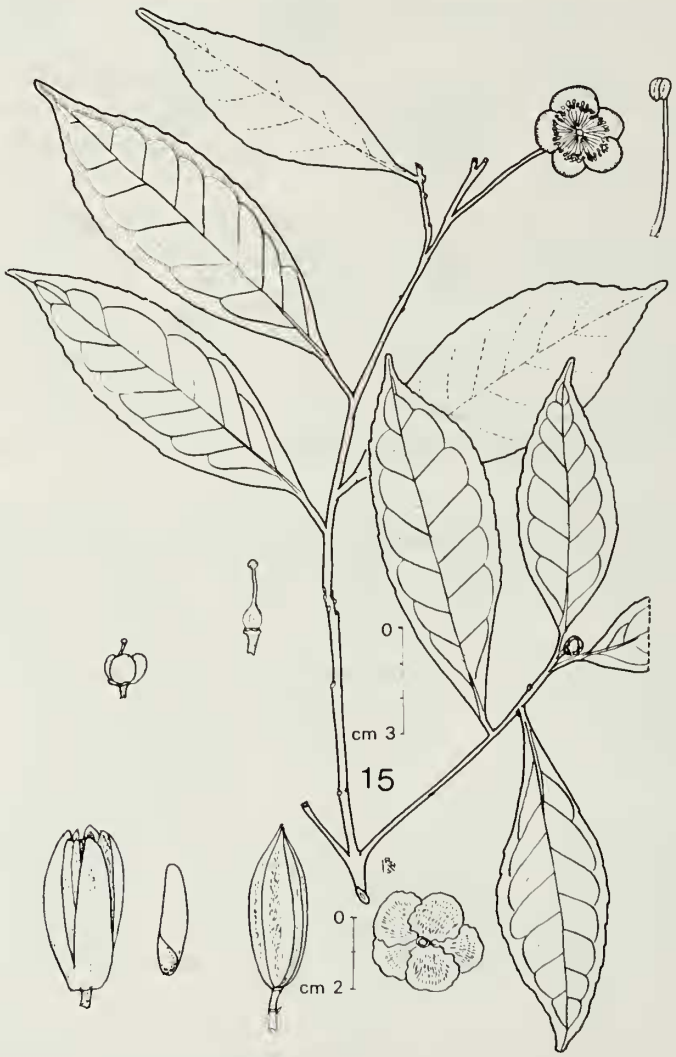

Fig. 15. *Gordonia penangensis* Ridl.
Malaya, *Curtis 834 (isotype).*

VERNACULAR NAME: *palembang putih.*

NOTE. This plant was first collected by P. W. Korthals from the forests of Melintang Mountains (near Padang) between April and May, 1834 during his trip to W. Sumatra. Over a dozen sheets of the same plant (including flowers buds, flowers and a single fruit) are preserved in the Leiden Herbarium to-day. Korthals was probably fascinated by the small flowers with an ovoid ovary totally devoid of styles. In some of these specimens a tiny sheet of paper with hand-written '*Gordonia*' was attached. This was possibly done in the field. Later he described this plant under a new generic name *Closaschima.*

Miquel's *Laplacea aromatica* was based on H. Diepenhorst's collection from Priaman, very near the area where the Korthals' collection was made. Miquel compared his 'new species' with *Laplacea vulcanica* (= *G. vulcanica*) but failed to do so with Korthals' *Closaschima ovalis*, with which it agrees in almost every aspect. Miquel also proposed two new varieties of this species: var. *longifolia* has longer (10–12.5 cm long) lanceolate-oblong leaves, and var. *minor* has smaller, elliptic-lanceolate leaves. The leaves of var. *minor* match closer the type specimens of Korthals.

Szyszylowicz (1893) transferred *Laplacea aromatica* Miq. to *Haemocharis*; at the same time, he cited *L. semiserrata* Miq. as a synonym. This was obviously a mistake, as Miquel never described a species under such a name which is in fact a New World one, namely, *Laplacea semiserrata* Cambess. from Brazil.

There are two distinct forms (which probably warrant infraspecific status) in *Gordonia ovalis*. In one form the leaves are generally smaller (4.5–7 cm long), thin membranous and their leaf-apices usually gradually taper to a blunt point; this includes the type specimens of *Closaschima ovalis* Korthals and *Laplacea aromatica* Miquel, and most specimens were collected from Pariamen-Padang area in the south. In another form the leaves are usually larger (6–9 cm long), thin-coriaceous and their leaf-apices are obtuse or rounded; this includes the type specimens of *Laplacea subintegerrima* Miq. and others from the Palembang area and Bangka Island in the northeast. There are no obvious differences in their flower and fruit structures. In both forms, in the styles are almost totally absent, with five stigmas lying on top of the hairy ovary.

15. Gordonia penangensis Ridl. J. Str. Br. Roy. As. Soc. 73 (1916) 142, Fl. Ml. Pen. 1 (1922) 203; H. Keng in Ng, Tr. Fl. Mal. 3 (1978) 286, *f. 4.* Fig. 15

Gordonia excelsa auct. *non* Blume: King J. As. Soc. Bengal 59, 2 (1890) 203.

A small, slender tree, 10–13 (-20) m tall. Bark smooth, pale grey brown; young twigs very slender, short-silky pubescent, greyish; older branches less hairy, brownish. Leaf-blades thin coriaceous, narrowly elliptic-lanceolate, apex acuminate or more frequently obliquely caudate, base attenuate or cuneate, 6–10 cm long, 2.5–4 cm wide, the upper half or two-thirds remotely serrulate or almost entire; midrib sulcate above and elevated below; nerves about 5–8 pairs, very faint above, barely visible beneath; drying light olive green; glabrous above, somewhat greyish

and tomentose below; petiole slender, 0.5–1 cm long, silky, brownish. Flowers solitary, terminal or subterminal on small branches; peduncle 2–3 mm long, silky tomentose. Bracteoles 2, triangular-cordate, 2–3 mm long, caducous. Sepals 5, ovate or suborbicular, thick coriaceous and with thinner and ciliate edge, silvery pubescent at the back, 5–7 mm long and wide. Corolla 2.5–3 cm across, yellowish to golden yellow; petals 5, suborbicular to spathulate, chartaceous, fused below. Androecium 5–6 mm long, the filaments joined into a short tube and briefly adnate to the corolla, more or less in 5 bundles. Gynoecium 9–11 mm long; style solitary, slender glabrescent, 6–7 mm long, the upper portion enlarged into club-shaped stigmas; ovary spherical, 3–4 mm across, woolly. Capsule cylindrical, 3.5–5 cm long, 1.5–2 cm across, glabrescent, 5-valved. Seeds 2.5–3 cm long including the wing.

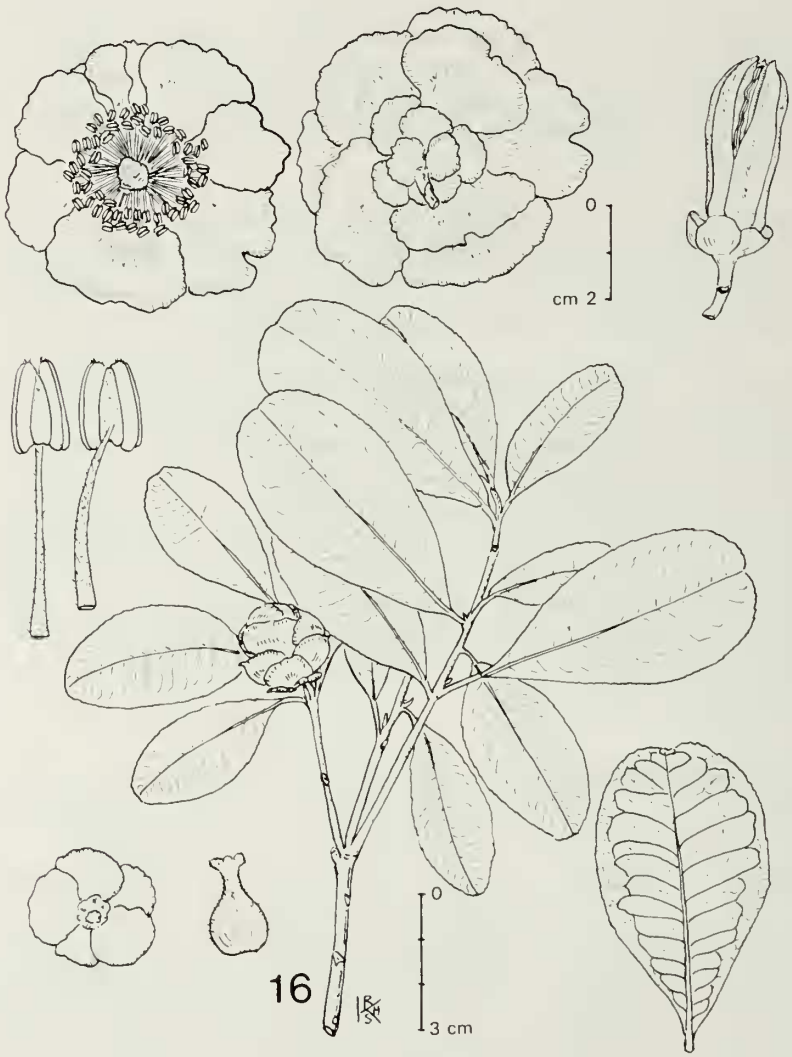

Fig. 16. *Gordonia polisana* Burk.
Philippines, *Celestino 695* (fl.); *Jacobs 7397* (fr.).

DISTRIBUTION. Malesia (the Malay Peninsula).

Malay Peninsula. Penang, Penang Hill, *Curtis 834* (isotype, SING), *Ng FRI 1054* (L). Perak, *Wray s.n.* (SING). Pahang, Cameron Highlands, *Md. Nur SFN 32948* (SING); *Whitmore FRI 15882* (L). Johore, Tg Penawar, *Cockburn FRI 7642* (L); Kota Tinggi, *Stone & Anderson 8714* (L). Singapore, Seletar, *Ridley 6214, 3913* (paratypes, SING); *Sinclair SFN 39585* (L), *Jumali 1048* (SING).

ECOLOGY. In open lowland forests, alt. 20–500 m. Fl.: Feb–May, fr.: May–June.

16. Gordonia polisana Burk., Philip. J. Sc. 15 (1919) 478; Merr., Enum. Philip. 3 (1923) 71. Fig. 16

Shrub or small tree, 8–15 m tall. Branchlets slender, glabrous. Leaf-blades thin-coriaceous, obovate or narrowly obovate, apex obtuse or rounded, often shallowly retuse, base acute or attenuate, 4–7 cm long, 2.5–3.5 cm wide, the upper part remotely crenulate-serrulate, the lower entire, nerves 12–14 pairs, not distinct; glabrous on both surfaces except a few scattered hairs on the midrib beneath; petiole 2–5 mm long. Flowers in upper leaf-axils, solitary; peduncle about 0.5 cm long. Bracteoles about 2. Sepals 5–6, broadly orbiculate or reniform, 0.8–1 cm long, densely yellowish silky externally. Corolla 7–8 (-14?) cm across, white (*fide* Celestino); petals 8–10, in two series, united below, densely covered with short yellowish hairs over the external surface and in the middle-basal portion on the internal. Androecium 1.2–1.5 cm long, the filaments puberulous. Gynoecium about 2 cm long, pubescent; ovary ovoid, about 1.5 cm long; style about 0.5 cm long, very thick and stout, the top enlarged and shallowly lobed into stigmas. Capsule broadly cylindric, 3.5–4 cm long.

DISTRIBUTION. Malesia (endemic to the Philipines; Luzon).

Luzon. Mt. Polis, Ifugao, Mountain Province, *M. Celestino 695* (*PNH 8021*) (L). Mt. Pulog, *Jacobs 7397, 7421* (L).

ECOLOGY. In mossy forest, above stream; alt. 1700–2300 m. Fl. Feb.–Mar. (two collections), fr.: Feb. (one collection).

NOTE. Among the 4 new species described by Burkill from the Philippines, this is undoubtedly the most outstanding. The type specimens (*Alvarez FB 18384* and *Sandkuhl 316*), both collected on Mt. Polis in Bontoc Sub-province, were not available for this study. Among a limited number of Philippino specimens at my disposal, I was only able to identify the above-cited ones as belonging to this species.

Burkill pointed out that (1) the leaves of this plant are rounded under the acumen, broadest above the middle; (2) the flowers are very large, about 9 cm (or according to Sandkuhl, 11–14 cm) in diameter; and (3) the capsule is about 4 cm long, long-tapering above.

The leaves of *Celestino 695* fully agree with Burkill's description. This bears two fully expanded flowers, the larger one measures about 8 cm in diameter. One unusual feature of the flowers, which Burkill failed to mention is that the petals are

8–10 in number and are arranged in 2 series. Petals of the outer series are intermediate between the largest sepals of the calyx and the smaller petals of the inner series.

17. Gordonia sarawakensis H. Keng **sp. nov.** Fig. 17

Arbor ca. 30 m alta. Folia angusto-lanceolata vel angusto elliptica, 12–15 cm long, acuminata vel breviter obtusa, basi cuneata, coriacea, nervis lateralibus 20–35 bene intra marginem anastomosantibus, pagina utrinque suborscuris, petiolo 3–5 mm longo. Flores flavi (*fide Banyeng & Benang*), axillares, solitarii, 5–6 cm diametro; bracteae 2–3, decicuae. Sepala coriacea, ovato-rotundata, 1–1.3 cm longa, dorso adpresse pubescentia. Petala late obovata vel lineario-lanceolata, 1.5–2.4 cm longa. Gynoecium 4.5 cm longum; stylo 0; stigmate 8–10. Capsula late ovoidea, 3–3.5 cm longa, valvis 8–10. — Typus, Sarawak, *Banyeng & Benang S25218*, in L.

A large tree, 30 m tall. Bark flaky. Young twigs with scattered short hairs; older branches stout, greyish brown glabrous. Leaf-blades coriaceous, narrowly ovate or narrowly elliptic, acuminate or shortly obtuse, base attenuate, very narrowly winged, 12–15 cm long, 5–6 cm wide; margin crenulate or undulate; midrib elevated beneath; nerves 18–25 pairs (often with lesser ones between) fused near the margin and forming a submarginal vein, faint on both surfaces; drying blade dark green or brown, with scattered short hairs on both surfaces; petiole very thick, 2–3 mm long. Flowers axillary, solitary, peduncle very stout, 4–5 mm long; bracts 2–3, deltoid-caudate, 4–5 mm long, caducous. Sepals 5, broadly ovate or suborbicular, 1–1.3 cm long and wide, thin-coriaceous, greyish silvery externally. Corolla 5–6 cm across yellow (*fide Banyeng & Benang*) or yellowish white (*fide Bujang*); petals 7–8, arranged in one series, varying from broadly obovate or obovate (1.8–2.0 × 1.4–1.8 cm) to narrowly obovate or linear lanceolate (1.8–2.4 × 0.8–1.2 cm), the exposed part in bud thick and silvery hairy externally, other parts thinner and glabrous. Androecium 5 mm long, the filaments glabrous, connate below and adnate to corolla. Gynoecium 4–6 mm long; ovary subglobose, hirsute; style absent or very short; stigmas 8–10, lying on top of the ovary. Capsule broadly ovoid or subglobose, 3–3.5 cm long, 2.5–3 cm across, dehiscing into 8–10 valves; short septicidal lines also developed near the base of the fruit. Seeds 2–2.2 cm long including the wing.

DISTRIBUTION. Malesia (Borneo: Sarawak & Sabah).

Sarawak. Kuching, 12th mile, Penrissen Road, *Banyeng & Benang S 25218* (holotype, L); Semengoh F.R., *Rosli S 14983* (L, SING), *S 15192* (L), *Hj. Bujang S 32444* (L), S 32957 (L, SING), *Galau S 15738* (L), *Zen 10031* (SING).

Sabah. Bukit Hampuan alt. 1300 m., Ranau *Aban Gibot 61804*; G. Lotung Inarat alt. 1700 m. Lamag, *Aban Gibot SAN 83233*; Mt. Silam, Lahad Datu, *Meijer & Anak SAN 37489, Mujin 37816*; along Labuk Road, Sandakan, *Mikil 46699* (all in SAN).

ECOLOGY. In lowland dipterocarp forest, alt. 10–100 m. or in hill forest, alt. 1300–1700 m. Fl.: July–Oct., fr.: Oct.–Nov.

VERNACULAR NAME: *entuyut*.

NOTE. Superficially this species resembles *G. multinervis* King of Malaya, but differs from the latter in detailed structures of the flower and fruit. This species

possesses 7–8 petals, more or less arranged in one whorl, (at least as seen in a fully expanded flower); the stamens are comparatively short and fewer in number; the gynoecium is devoid of styles, thus the 8–10 V-shaped stigmas are lying on top of the ovary which is 8–10 locular. The fully developed fruit is a nearly spherical capsule dehiscing loculicidally into 8–10 valves. Short septicidal lines (one each along the dorsal line of the capsule-valves) present near the base of the fruit. The combination of these features makes this species one of the most outstanding in the genus.

At first, all the available specimens referable to this species were collected from the lowland forest near Kuching, Sarawak. Later five specimens were found in a loan from Sabah Forest Department; they match well with the Sarawak material, except *Aban Gibot 61804 & Mujin 37816*, both flowering; in these, a short style (2–3 mm long) is present.

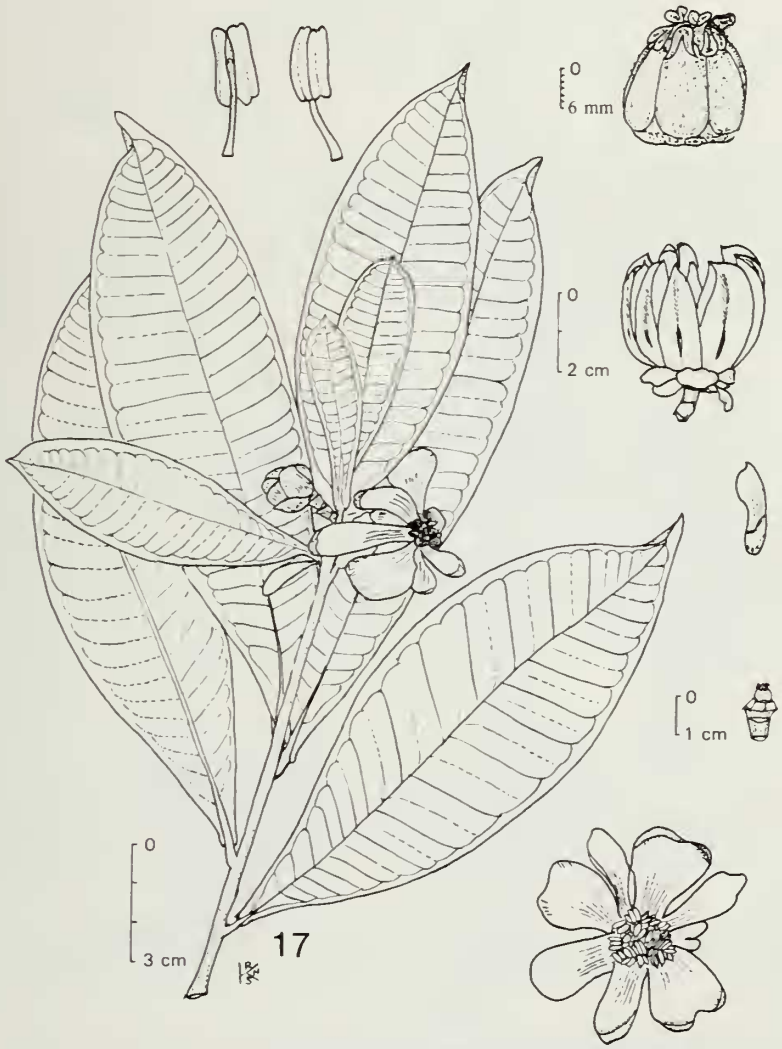

Fig. 17. *Gordonia sarawakensis* H. Keng **sp. nov.**
Sarawak, *Banyeng & Benang S 25218 (holotype)* (fl.); *Galau S 15738* (fr.).

18. Gordonia scortechinii King, J. As. Soc. Bengal 59, 2 (1890) 204; Burk., J. Str. Br. Roy. As. Soc. 76 (1917) 158; Ridl., Fl. Mal. Pen. 1 (1922) 204; H. Keng in Ng, Tr. Fl. Mal. 3 (1978) 286. Fig. 18

A tree to 18 m tall; bark smooth, brown. Young twigs slender, dark brown or greyish, puberulent; older branches glabrous. Leaf-blades thin-coriaceous, elliptic or narrowly elliptic, or sometimes narrowly obovate, apex obtuse or bluntly acute, base cuneate or obtuse, 6–9 cm long, 2.5–3.5 cm drying olive green; margin of the upper half or two-thirds remotely undulate or subentire; nerves 6–8 pairs, faint above, almost invisible below; glabrous on both surfaces, shining green above, subglaucous beneath; petiole 3–5 mm long, puberulent. Flowers subterminal and

Fig. 18. *Gordonia scortechinii* King
Malaya, *Scortechini 362 b (isotype)* (fl.); *Chelliah FRI 6545* (fr.).

axillary, solitary; peduncles subsessile or very short (2–3 mm long). Bracteoles 2. Sepals about 5, cordate-deltoid, 2–3 mm long and wide. Corolla 1.5–1.8 cm across, butter yellow; petals 5, ovate or suborbicular, strongly concave, 8–9 mm long and wide, thin-chartaceous, sparsely silvery puberulous externally, briefly joined at base and adnate to the filaments. Androecium 6–8 mm long; the filaments glabrous, briefly united below. Gynoecium 5–6 mm long; styles 3 (or 4?), free to base, spreading; stigmatic surface inside the tip of styles; ovary ovoid densely strigose. Capsule 1.8–2 cm long, glabrous, dehiscing into 3 (or 4?) valves; sepals caducous. Seeds 1.2–1.4 cm long including the wing.

DISTRIBUTION. Endemic to the Malay Peninsula. (Perak, Kelantan Trengganu, Selangor?)

Malay Peninsula. Perak, without locality, *Scortechini 362* b (isotype, SING) Kelantan, *Whitmore FRI 20647* (SAN). Trengganu, Bukit Rauk F.R. Dungun, *S. Chelliah FRI 6545* (L).

ECOLOGY. In hillside primary forest. Fl.: Mar. (one collection), fr.: Nov. (one collection with two specimens).

NOTE. King (l.c) points out that this species superficially resembles *G. maingayi*, but it has smaller flowers with fewer stamens (about 30) and a 3-locular ovary with 3 free styles. Burkill (l.c.) states that this species "might be described a *G. imbricata* with an admixture of *G. maingayi*. Its branches however are more slender than the first of these two and its flowers are recorded as remarkably small, the stamens being not more than 30."

For years, only the original collection (*Scortechini 362 b*) was known. During the course of this study, the other specimen which can positively be identified as this species in *Chelliah FRI 6545* from Trengganu. It has a small 3-valved capsule and agrees closely with the type specimen in all aspects of vegetative characters except that the texture of leaves appears slightly thicker. Besides, two other collections possibly also represent this species: (1) Perak, Piah F.R. *Ja'mat FMS 3931* (SING), several small flower buds being present (dissection of one large bud revealed numerous perianth-lobes without any sign of reproductive organs in the centre and is likely to be a gall flower); (2) Selangor, Klang Gates quartz Ridge, *Stone 12094* (L), the small capsules being 4-valved.

19. Gordonia singaporeana Wall. [Cat. no. 1457 (lith. 1829) *nom. nud.; Ridl. J. Str. Br. R. As. Soc. 73 (1916) 141, nom.,* Burk., op. cit., 154, *f. 1, 2, 3, 12, & 13, nom.*] ex Ridl. Fl. Mal. Pen. 1 (1922) 202; Corner. Ways. Tr. 2nd ed. (1952) 629, *pl. 186, f. 236*; H. Keng in Ng, Fl. Mal. 3 (1978) op. cit., 286. Fig. 19

Gordonia grandis King J. As. Soc. Beng. 59, (1890) 203, *non* André (1880).

Gordonia excelsa Bl. var. *sincapuriana* Dyer in Hook. f., Fl. Brit. Ind. 1 (1872) 291.

A tree up to 32 m tall. Bark black, scaly, Young twigs puberulous or glabrous. Leaf-blades thin coriaceous, elliptic or oblong-lanceolate 7–12 (-15) cm long, 2.5–5

(-8) cm wide, apex subrounded or abruptly acuminate, base acute or attenuate, slightly decurrent or not; margin crenulate-serrate or undulate, usually entire near the base; nerves 10–12 pairs, merged and looped near the margin into submarginal reticulations, barely visible above, even less conspicuous below; glabrous on the upper surface, short appressed pubescent beneath; petiole 2–5 mm long, puberulous. Flowers in upper leaf-axils, usually solitary; peduncles 0.3–5 (-0.75) cm long, stout, pubescent. Bracts and bracteoles about 3, caducous. Sepals 5–6, cordate, subrounded or reniform, often notched above, 6–8 mm long, densely covered with greyish hairs externally and also near the base on the inner surface. Corolla 4–5 cm across, cream white, scentless; petals 5–6, broadly oblong or obcordate, 2–2.4 cm long, sericeous on the external surface, scattered puberulous on the internal. Androecium about 1 cm long, the filaments glabrous, connate below.

Fig. 19. *Gordonia singaporeana* Wall. ex Ridl.
Singapore, fresh material.

Gynoecium 6–8 mm long, the ovary ovoid, 4–5 mm long, densely covered with long, yellowish grey hairs, tapering above to form a stout style which branches into five for about half its length. Capsule ovoid cylindric, 3–3.5 cm long, dehiscing into 5 valves; seeds 2–2.5 cm long including the wing.

DISTRIBUTION. Malesia (the Malay Peninsula).

Malay Peninsula. Penang, Government Hill, *Burkill 2891, Curtis 2281, Philip CF 1002, Ridley 7963.* Selangor, Fraser's Hill, *Md. Nur 11174, 11454.* Malacca, *Alvins s.n.* in 1886, *Curtis 3488, Derry 976, Maingay 191, 1072, Ridley 976.* Johore, Mawai, *Corner 29253, Ngadiman SFN 34757.* Singapore, *Corner 33564, Ngadiman SFN 35000, 34923, Ridley 1946, 3812, 4564, 4801* (all in SING, except *Maingay 1072, Ridley 976, 481,* L).

ECOLOGY. In primary and mature secondary forests; altitude 50–1300 m. Fl.: May, June & Oct.; fr.: Aug., Nov. & Dec.

VERNACULAR NAMES: *kayu kelat asam, kayu kelat putih, sawak pulot.*

NOTE. Corner (l.c.) observed that this tree is nocturnal, the flowers open at dusk and fall next morning. He also noted that the flowering is seasonal and occurs more than once in a year, perhaps after dry weather.

20. Gordonia taipingensis Burkill, J. Str. Br. Roy. As. Soc. 76 (1917) 148, *f. 6;* Ridl., Fl. Mal. Pen. 1 (1922) 204; H. Keng in Ng, 288. Fig. 20

Small to medium-sized tree, 12–16 (-20) m tall. Young twigs covered with short hairs. Leaf-blades membraneous or thin coriaceous, elliptic to elliptic-oblong, apex acuminate, obtuse or briefly caudate, base cuneate or attenuate, (8-) 13–20 (-30) cm long, (3.5-) 4.5–7.5 cm wide; margin of the upper two-thirds remotely crenulate, entire below; nerves 10–11 pairs on each side, slightly elevated above, faint and inconspicous below; dark green and glabrous above, with scattered strigose hairs on the midrib beneath, otherwise glabrous; petiole 1.5–2 cm long, with scattered short hairs. Flowers axillary, solitary; bracteoles and bracts about 3, caducous; peduncle 0.2–0.5 cm long. Sepals ovate, broadly ovate to suborbicular, 1.2–1.7 cm long and broad, coriaceous, sericeous on both surfaces, but more densely hairy externally. Corolla 5–6 cm across, yellowish; petals 5–6, broadly oblong, suborbicular to reniform, 2.5–3 cm long, the exposed portion of the three outer petals thick and densely sericeous, the covered portion and the two inner petals membranous and puberulous. Androecium 1–1.2 cm long; stamens numerous, in 3 whorls and more or less in 5 bundles, the filaments hairy below, connate briefly with the base of corolla tube. Gynoecium about 1 cm long; ovary globose, densely sericeous, about 6 mm across, the upper tapering into a short style (about 4 mm long) with 5 branches (about 2 mm long). Capsule (immature) ovoid, 2 cm long, subtended by the persistent calyx.

DISTRIBUTION. Malesia (the Malay Peninsula: Perak and Pahang).

Malay Peninsula. Perak, Taiping Hill, *Md. Haniff & Md. Nur SFN 2359* (isotype, SING); Caulfield's Hill, *Md. Haniff & Md. Nur SFN 12734* (SING); Birch's Hill, *Wray 617* (SING). Pahang. Cameron Highlands, *Henderson 11191* (SING).

ECOLOGY. In montane forests, altitude 1200–1700m. Fl.; Feb. & June.

21. Gordonia vulcanica (Korth.) H. Keng, **comb. nov.**

Laplacea vulcanica Korth., Kruidk. (1842) 138, *t. 26*; Miq., Fl. Ind. Bat. 2 (1857) 490.

Haemocharis vulcanica O. Ktze, Rev. Gen. (1891) 62 (as '*vulcania*'); Burk., op. cit., 157.

Gordonia densiflora Ridl. J. Fed. Mal. St. Mus. 8 pt. 4 (1917) 17 **Syn. nov.**

Fig. 21

var. **vulcanica**

A stout shrub, 2–6 m tall, or sometimes a crooked tree to 20 m tall, densely crowned. Young twigs densely covered with yellow or black hispid hairs; older branches stout, less hairy. Leaf-blades coriaceous or thick-coriaceous, ovate or broadly oblong, apex rounded or obtuse, sometimes retuse or emarginate, base rounded or very shallowly cordate, 2.5–5 (-6) cm long, 2–2.5 cm wide; margin of the upper half or two-thirds remotely serrulate or subentire; nerves 5–7 pairs, often slightly impressed above, faint or inconspicuous beneath; drying green and glabrous but often verrucous above, light green and somewhat faintly glaucous below, strigose near and on the midrib especially at the base; petiole stout, 1–3 mm long, sometimes almost sessile, hispid. Flowers in upper axils or subterminal, solitary or 2–3 together; peduncles almost absent or very short, 1–2 mm long, stout. Bracteoles, bracts and sepals 8–10, forming an involucre about 1–1.2 cm high, silvery wooly on the back, and increasing in size from the lower bracteoles (deltoid, 2–3 mm long) to the upper sepals (broadly obovate or suborbicular, 1–1.2 cm long). Corolla 4–5 cm across, creamy white (*fide* de Wilde); petals 5–6, varying from reniform to obcordate, 1.5–2.5 cm long, membranous, tapering below, glabrous except the lower one or two which are silvery puberulous and thickened at the back in the central portion, all petals are briefly joined at the base and adnate to the filaments. Androecium 6–7 mm long, the filaments briefly united below, often in 5 less distinct fascicles. Gynoecium 8–9 mm long; style columnar, 2–3 mm long, ridged, the upper portion separating into 5 free branches; ovary ovoid, 4–5 mm long, strigose or velutinous. Capsule 2.5–3 cm long, puberulous, dehiscing into 5 valves; sepals caducous eventually. Seeds 1.2–1.5 cm long including the wing.

DISTRIBUTION. Malesia (W. & Central Sumatra.)

Sumatra. Without precise locality, *Korthals Herb. Lugd. Bat. 908. 251-803,-804, -815, -824* (lectotype) (L); *Beccari 207* (L). Atjeh, *Jeswiet 6827* (L); G. Losir, Atjeh, *Steenis 8473* (BO), *8493, 8636, 9653* (L), *de Wilde & de Wilde-Duyfjes 15276, 15432, 16141, 16565* (L). Mt. Sinabung, *Lorzing 8182, 13681* (L). G. Singgalang, *Bunnemeijer 2839* (L); Mt Kerintji, *Jacobs 4417* (L); Korinchi Peak, *Robinson & Kloss s.n.* 10 May 1914 (holotype of *Gordonia densiflora* Ridl., SING). Mt Tanggamus, Lampung, *Jacobs 8246* (L).

ECOLOGY. In montane forest, mostly in mossy elfin forests or in dense *Gleichenia* scrubs, sometimes near streams; alt. 2000–3400 m. Fl.: Jan.–May; fr.: April–July.

NOTE. Korthals described this species as having 5 free styles. This was because his description was based on small flower-buds rather than fully developed flowers.

Ridley's *Gordonia densiflora* is clearly a synonym.

var. **buxifolia** (Miq.) H. Keng, **stat. nov.**

Laplacea buxifolia Miq., Fl. Ind. Bat. Suppl. (1861) 482.

Haemocharis buxifolia (Miq.) Szyszyl. in E. & P., Pflanzenfam. 3, 6 (1893) 185; Burk., J. Str. Br. Roy. As. Soc. 76 (1917) 158.

It differs from the above in the smaller and narrower (3–4 × 1–1.5 cm, rarely to 6 × 2 cm) leaves with less conspicuous nerves, and in the smaller fruit (1.2–1.4 cm long) (? immature).

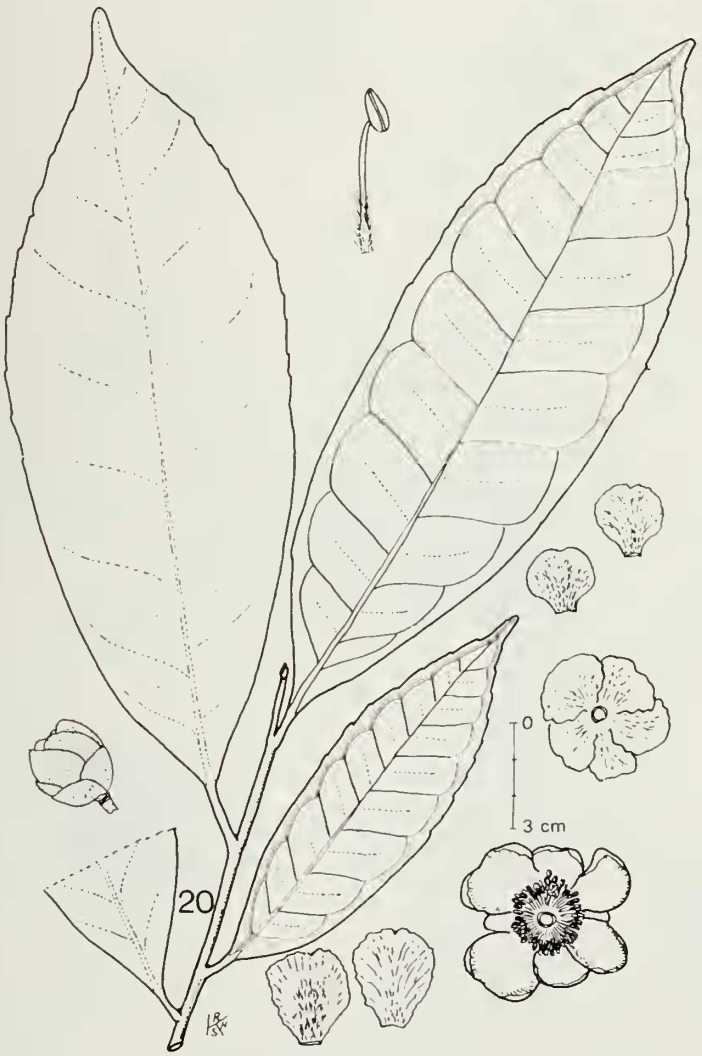

Fig. 20. *Gordonia taipingensis* Burk.
Malaya, *Md. Haniff & Md. Nur SFN 12734* (fl.).

DISTRIBUTION. Malesia (W. Sumatra.)

Sumatra. Paya Kombo, *Herb. Teysmann H. B. 656* (isotype of *Laplacea buxifolia* Miq.); Mt. Sago, near Pajakumbuh, *Meijer 5525;* Taram, Bukit Paku, Pajakumbuh, *Meijer 7171.* Gajo Loeus G. Agosan, *Neth. Ind. For. Serv. bb. 22441* (L).

ECOLOGY. *Meijer 5525* was collected from 1800–2000 m, and *Meijer 7171,* from 600 m. Fr.: July.

NOTE. This variety probably represents merely a diminutive form of the above. The two taxa may have to be merged eventually.

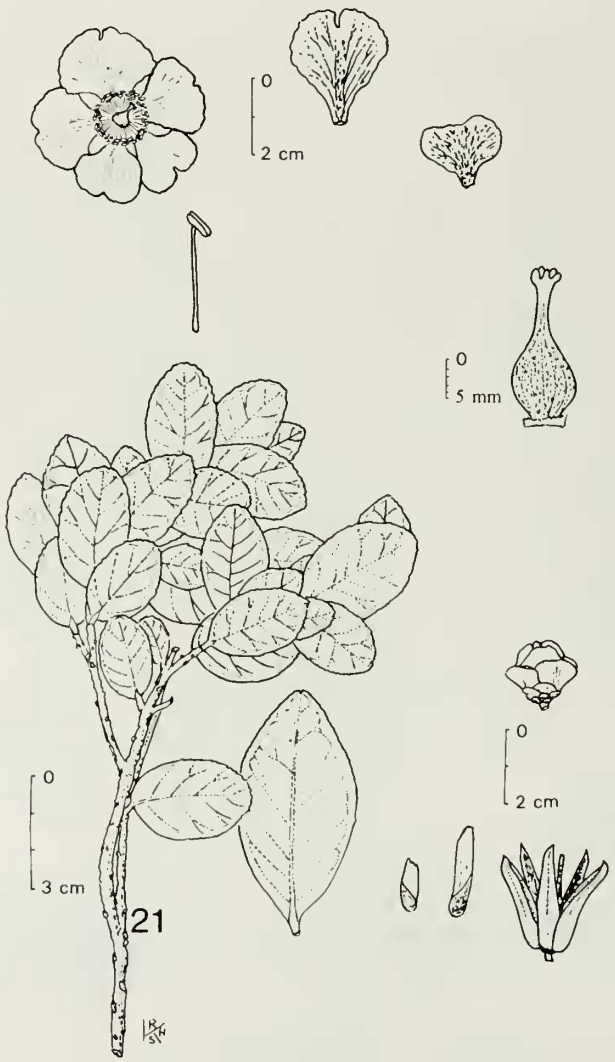

Fig. 21. *Gordonia vulcanica* (Korth.) H. Keng **comb. nov.**
Sumatra, *Steenis 8493* (habit); *de Wilde & de Wilde-Duyfjes 16565* fl & fr).

Excluded and Doubtful Species

1. *Gordonia brevifolia* Hook.f., Trans. Linn. Soc. 23 (1860) 162; Burk., J. Str. Br. Roy. As. Soc. 76 (1917) 158.
   = *Schima brevifolia* (Hook.f.) Stapf. in Hook. Ic. IV, 3 (1893) *t. 2264*, Trans. Linn. Soc. Bot. 4 (1894) 135.

2. *Gordonia lanceifolia* Burk., op. cit., 150. Fig. 22
   Burkill writes: "*G. lanceifolia*, a new species, comes near to *G. luzonica*. It has leaves of the same outline but more nearly entire, and differently veined. Its

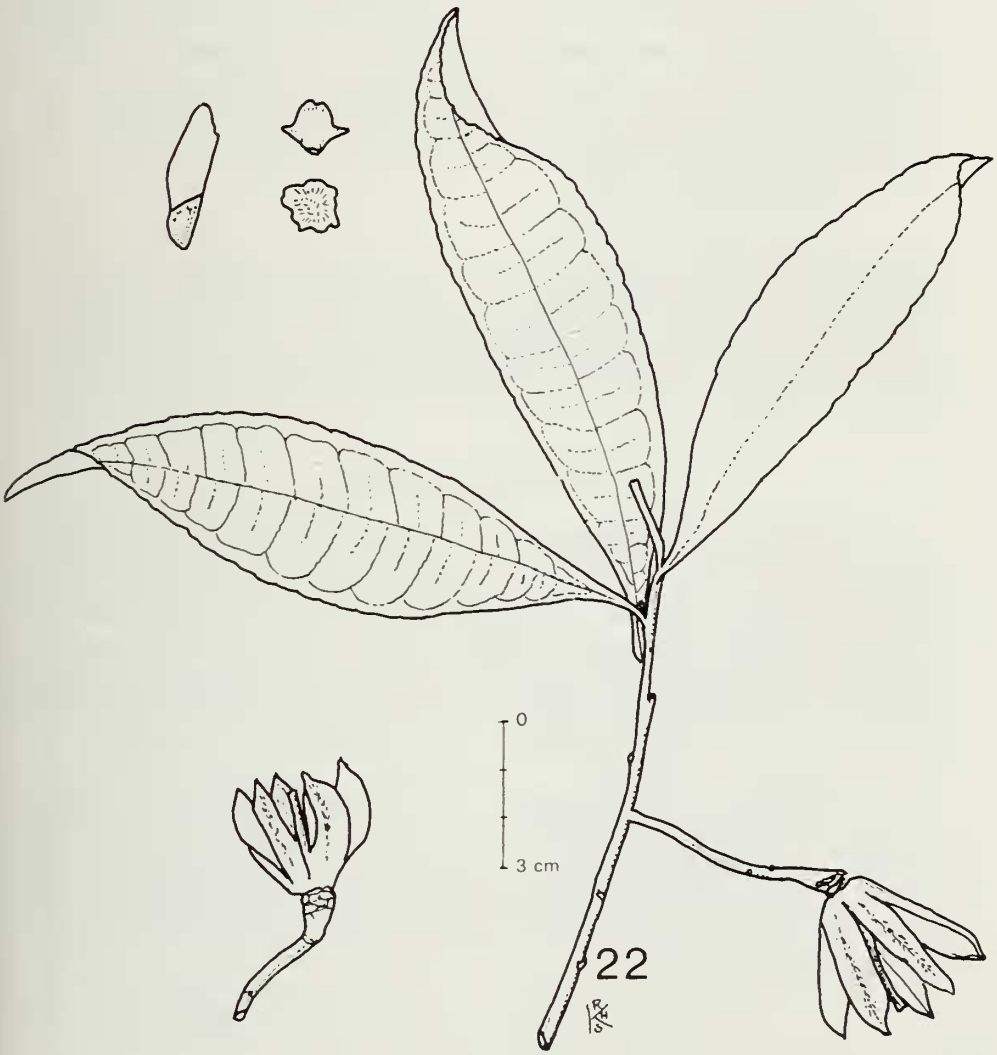

Fig. 22. *Gordonia lanceifolia* Burk.
Sarawak, *Haviland 1010 (holotype)*.

capsule terminate leafless branchlets which may be 4 cm long. It occurs in Borneo near Kuching". Only a single specimen, the holotype, *Haviland 1010* (SING) was available for this study, which is a fruiting one. A recent (here depicted in figure 22) collection from Sarawak, which is close to or probably referable to this species is: *P. Chai S 32128* (L, SAN), collected from Segan For. Res., Bintulu on Sept. 19, 1972. It differs from the type specimen, however, in the smaller leaves (to 11 vs. to 13 cm long) and fruits (to 2.5 vs. to 3 cm long). There is only a single 5-valved fruit in the type, but over twenty dry capsules in P. Chai's collection, mostly 6-valved, few are 7- or 5-valved.

3. *Gordonia lobbii* Hook. f., Trans. Linn. Soc 23 (1860) 162; Burk., op. cit., 156. This species was based on T. Lobb's collection from Sarawak. Mr L. L. Forman of the Royal Botanic Gardens, Kew, kindly sent me a photo of the type specimen and copied Mr Airy-Shaw's annotation as follows: "On right, middle —' leaves crenate/ cf. *S. superba* Grdn. et Champ. The word '*Schima*' (Bottom right corner) is in Pierre's hand". Shaw's note says 'verisim a cl. Pierre scriptum'. The photo appears to confirm J. B. L. Pierre's and H. K. Airy-Shaw's identification that it is a specimen of *Schima.*

4. *Laplacea sarasini* Warb. MS.
Melchior [(in E. & P. Pflanzenfam. ed. 2, 21 (1925) 136)] mentioned this unpublished S. Celebes species in his key to the Malesian *Laplacea.* it differs from other species, according to his key, in the leaves being more or less herbaceous, glabrous, and with an acuminate (or cuspidate) apex. No specimens have been seen. *L. sarasini* is probably a synonym of *G. amboinensis.*

IV. Acknowledgements

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