

NOTES ON MAGNOLIACEAE II
Revision of *Magnolia* sections *Maingola* (Malesian species),
Aromadendron, and *Blumiana*

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SUMMARY

These notes are sequel to the Notes on Magnoliaceae in *Blumea* 31 (1985) 65–121. First the addenda to those notes are given. Then follows a revision of the species of *Magnolia* which belong to the sections *Aromadendron* and *Blumiana*, and the Malesian species of section *Maingola*. A survey with SEM photos is given of the undersurfaces of the leaves of sections *Maingola* and *Aromadendron*, to assist in identifying the species. A key to the sections is given, a key to the species of sections *Maingola* and *Aromadendron* together, and keys to the species of each section.

In section *Maingola* 5 species are recognized for Malesia. *Michelia beccariana* Agostini and *Magnolia aequinoctialis* Dandy are reduced to *Magnolia macklottii* var. *beccariana* (Agostini) Noot. *Magnolia carsonii* Dandy ex Noot. with var. *carsonii* and var. *drymifolia* Noot., *M. phaulantha* Dandy ex Noot. and *M. uvariifolia* Dandy ex Noot. are newly described.

In section *Aromadendron* also 5 species are recognized. *Talauma bintuluensis* Agostini is renamed *Magnolia bintuluensis* (Agostini) Noot. and *Aromadendron nutans* Dandy is reduced to that species. *Magnolia ashtonii* Dandy ex Noot., *M. borneensis* Noot., and *M. pahangensis* Noot. are newly described.

In section *Blumiana* 7 species are recognized. *Magnolia pachyphylla* Dandy, *Talauma andamanica* King, *T. athliantha* Dandy, *T. borneensis* Merr., *T. forbesii* King, *T. gitingensis* Elmer, incl. var. *glabra* Dandy and var. *rotundata* Dandy, *T. gracilior* Dandy, *T. inflata* P. Parm. [= *T. undulatifolia* Agostini], *T. kunstleri* King, *T. miqueliana* Dandy, *T. oreadum* Diels, *T. peninsularis* Dandy, *T. rabaniana* Craib, *T. rubra* Miq., *T. sebassa* Miq. ex Dandy, *T. sumatrana* Agostini, and *T. soembensis* Dandy are reduced to *Magnolia candollii* (Blume) H. Keng var. *candollii*. *Talauma betongensis* Craib, *T. hodgsoni* Hook. f. & Thomson, *T. levissima* Dandy, *T. oblanceolata* Ridley, and *T. obovata* Korth. are reduced to *Magnolia candollii* var. *obovata* (Korth.) Noot. *Talauma angatensis* (Blanco) Vidal and *T. villariana* Rolfe are reduced to *M. candollii* var. *angatensis* (Blanco) Noot. *Talauma beccarii* Ridley is reduced to *M. candollii* var. *beccarii* (Ridley) Noot. *Talauma kuteinensis* Agostini and *T. singapurensis* Ridley are reduced to *M. candollii* var. *singapurensis* (Ridley) Noot. *Talauma gigantifolia* Miq. is renamed *Magnolia gigantifolia* (Miq.) Noot. to which *T. megalophylla* Merr. and *T. magna* Agostini are reduced. *Talauma sarawakensis* Agostini [= *T. intonsa* Dandy] is renamed *Magnolia sarawakensis* (Agostini) Noot. In *M. persuaveolens* Dandy [= *Talauma persuaveolens* (Dandy) Dandy] the subspecies *rigida* Noot. is newly described with var. *rigida* and var. *pubescens* Noot. Finally *Magnolia lasia* Noot. and *M. mariusjacobsii* Noot. are newly described.

Addenda to Notes on Magnoliaceae, Blumea 31 (1985) 65–121:

p. 82: Key to the genera:

2b. Fruits consisting of few to many separate free or connate carpels along the torus.

p. 83: under the synonymy of *Magnolia*: *Magnolia* section *Blumia* (Nees) Baill. should not be accepted. Also p. 89 under 14. Section *Blumiana*.

p. 85: Key to the subgenera and sections:

13b. Add 'often' between Connective and produced.

p. 92: Key to the species in Malesia:

4b. Hairs 'if' present.

p. 108: under the synonymy of *Michelia*, under *Liriopsis* Spach, add: *Magnolia* section *Liriopsis* Baill., Hist. Pl. 1 (1868) 142, note 4.

After *Liriopsis* add the following synonym: *Talauma* section *Spongocarpum* King, Ann. Bot. Gard. Calc. 3 (1891) 205. — Type: *Talauma spongocarpa* King, l.c., t. 47 bis.

p. 109: Key to the species in Malesia:

3b. *M. sumatrae* should be *M. salicifolia*.

MAGNOLIA

Magnolia Linné, Sp. Pl. (1753) 535; Gen. Pl. ed. 5 (1754) 240; Noot., Blumea 31 (1985) 83.

Blumia Nees, Flora 8 (1825) 152, non *Blumea* DC., nom. cons. — *Magnolia* sect. *Blumia* (Nees) Baill., Adansonia 7 (1866) 2, nom. illeg.

For further synonymy and description see Nootboom (1985).

Distribution. About 120 species, one third of which in the New World from SE. North America to South Brazil, the remainder in temperate and tropical SE. Asia from the Himalaya to China, Japan, Taiwan and Malesia. In Malesia represented by the section *Maingola* Dandy of subgenus *Magnolia*, and the sections *Blumiana* Blume and *Aromadendron* (Blume) Noot. of subgenus *Talauma*.

Notes. Two species of subgenus *Magnolia* are commonly cultivated in Malesia, *M. coco* (Lour.) DC. and *M. grandiflora* L. *Magnolia coco* (section *Gwillimia*) differs from the species in section *Maingola* because the stipules are adnate to the petiole. The species can be recognized from section *Blumiana*, especially from *M. candollii*, by the midrib being not prominent on the upper surface. *Magnolia grandiflora* (section *Theorodon*) has petals of 7 cm long or even longer while those in section *Maingola* never exceed 5 cm. The stamens in *M. grandiflora* are 2–3 cm long and the densely appressedly pubescent brachyblast is 8 mm diam. or more.

The species of section *Gwillimia* are not found in the wild in Malesia, but they are elsewhere in SE. Asia. In the absence of fruit they cannot be distinguished from section *Blumiana*. In some cases species of both sections are even likely to be confused as for instance *Magnolia henryi* Dunn, also described as *Talauma kerrii* Craib, which in the absence of fruits is very similar to *Magnolia candollii* var. *obovata*.

KEY TO THE SECTIONS
(only in Malesia)

- 1 a. Stipules free from the petiole. Midrib not prominent above 2
 b. Stipules adnate to the petiole. Midrib prominent above ... 3. Section **Blumiana**
 2 a. Fruits with free carpels 1. Section **Maingola**
 b. Fruits with connate carpels 2. Section **Aromadendron**

To make identification of collections without fruits possible, besides the keys to the species of each section a separate key is given to the sections *Maingola* (Sect. 1) and *Aromadendron* (Sect. 2) together.

KEY TO THE SPECIES OF SECTIONS MAINGOLA AND AROMADENDRON

- 1 a. Young twigs and underside of leaves hairy. Carpels free in fruit 2
 b. Young twigs mostly and underside of leaves always glabrous. Carpels free or connate in fruit 5
 2 a. Gynaecium hairy 3
 b. Gynaecium glabrous 4
 3 a. Young twigs pubescent or pilose. Scars of perianth and stamens along 5–9 mm of the torus under the fruit. Stamens 7.5–12 mm, the 2–3 mm long connective appendage not included Sect. 1: **1. M. macklottii**
 b. Young twigs densely woolly hairy. Scars of perianth and stamens along 10–15 mm of the torus. Stamens 6–9 mm long, the 1.5–2 mm long connective appendage not included Sect. 1: **3. M. maingayi**
 4 a. Scars of perianth and stamens along 5–9 mm of the torus under the fruit. Stamens 7.5–12 mm, the 2–3 mm long connective appendage not included. Outer tepals 2–3 cm long Sect. 1: **1. M. macklottii**
 b. Scars of perianth and stamens along 10–20 mm of the torus under the fruit. Stamens c. 6 mm long, the c. 5 mm long connective appendage not included. Outer tepals 3.5–4 cm long Sect. 1: **4. M. uvariifolia**
 5 a. Tepals c. 18 or more. Carpels connate in fruit. Connective appendage 10–15 mm. Petiole 8–25 mm. Pedicle 0–10 mm. Alveoles in general more than 0.5 mm diam. Reticulation on the upper surface quite distinct 6
 b. Tepals at most 12. Carpels free or connate in fruit. Connective appendage 0.5–15 mm 7
 6 a. Leaves mostly narrowly elliptic; primary nerves in 11–16 pairs. Pedicle 5–10 mm. Outer tepals 4, 4.5–7 cm, inner tepals 15–33. Connective appendage 12–15 mm Sect. 2: **6. M. elegans**
 b. Leaves mostly obovate; primary nerves in 8–12 pairs. Pedicle absent. Outer tepals 3, c. 2 cm long, inner tepals c. 15. Connective appendage 10–12 mm
 Sect. 2: **7. M. bintuluensis**

- 7 a. Stamens c. 10, 4 mm long, the connective appendage c. 7 mm. Carpels c. 6. Pedicle absent, scars of stamens and perianth at most 1 mm
Sect. 2: **10. *M. pahangensis*** 8
- b. Stamens more than 10 and longer than 4 mm. Carpels in general many 8
- 8 a. Petiole 2.5–5 cm. Pedicle 7–8 mm. Gynophore 5–10 mm. Carpels connate in fruit Sect. 2: **8. *M. ashtonii***
- b. Petiole 3–17 mm. Pedicle 10–5 mm. Gynophore 0–5 mm. Carpels free or connate in fruit 9
- 9 a. Outer tepals 4, c. 4.5 cm long. Stamens 9–14 mm, the 10–15 mm long connective appendage not included. Scars of tepals and stamens under the fruit along c. 5 mm of the torus. Carpels connate in fruit Sect. 2: **9. *M. borneensis***
- b. Outer tepals 3, 1.5–4 cm long. Stamens 5–12 mm, the 0.5–3 mm long connective appendage not included. Scars of tepals and stamens under the fruit along c. 1–9 mm of the torus. Carpels free in fruit 10
- 10a. Stamens (5–)7.5–12 mm, the 2–3 mm long connective appendage not included. Scars of tepals and stamens along 5–9 mm of the torus. Carpels many (rarely less than 15) Sect. 1: **1. *M. macklottii***
- b. Stamens 5–10 mm, the 0.5–3 mm long connective appendage not included. Scars of tepals and stamens under the fruit along 1–3 mm of the torus. Carpels 1–15 11
- 11a. Stamens c. 5 mm, the 0.5–1 mm long connective appendage not included. Scars of perianth and stamens along 1 mm of the torus . Sect. 1: **5. *M. phaulantha***
- b. Stamens 5–10 mm, the 1–1.5 mm long connective appendage not included. Scars of perianth and stamens along 2–3 mm of the torus
Sect. 1: **2. *M. carsonii***

Subgenus *Magnolia*

Ripe fruits consisting of free carpels which dehisce along the dorsal suture. Anthers dehiscing introrsely. Flowers neither precocious nor with a much reduced calyx-like whorl of outer tepals. Leaves in Asia evergreen.

Only one section indigenous:

1. Section *Maingola*

Section *Maingola* Dandy, Curtis Bot. Mag. 155 (1948) sub t. 16; Noot., Blumea 31 (1985) 88.

KEY TO THE SPECIES

- 1 a. Carpels many, or at least 15 (rarely in *M. macklottii* fewer). Scars of perianth and stamens in fruit along 5–20 mm of the torus 2
- b. Carpels at most 15. Scars of perianth and stamens in fruit along 1–3 mm of the torus 4

- 2 a. Twigs (long) yellowish pubescent, pilose, or glabrous. Scars of perianth and stamens in fruit along 5–9 mm of the torus 1. *M. macklottii*
 b. Twigs woolly hairy when young. Scars of perianth and stamens in fruit along 10–20 mm of the torus 3
- 3 a. Fruits hairy, 5–8 cm long. Scars of perianth and stamens in fruit along 10(–15) mm of the torus. Brachyblast 1–5 cm 3. *M. maingayi*
 b. Fruits glabrous, 7–12 cm long. Scars of perianth and stamens in fruit along 10–20 mm of the torus. Brachyblast 4.5–11 cm 4. *M. uvariifolia*
- 4 a. Scars of perianth and stamens in fruit along c. 1 mm of the torus. Petiole 5–10 mm 5. *M. phaulantha*
 b. Scars of perianth and stamens in fruit along 2–3 mm of the torus. Petiole 6–18 mm 2. *M. carsonii*

1. *Magnolia macklottii* (Korth.) Dandy

Magnolia macklottii (Korth.) Dandy, Kew Bull. (1927) 263; Backer & Bakh. f., Fl. Java 1 (1963) 97; Noot. in Whitmore & Tantra, Tree Fl. Indonesia, Sumatra Check List (1986) 141. – *Manglietia macklottii* Korth., Ned. Kruidk. Arch. 2, Versl. (1851) 97; Miq., Fl. Ind. Bat. 1, 2 (1858) 15, excl. coll. Haleban; Suppl. (1860) 153; Ann. Mus. Bot. Lugd. Bat. 4 (1868) 71, excl. coll. ex Haleban. – Type: *Korthals* (L, sheet nr. 908.126-1018; iso BO), Sumatra, Mt Singalan.

Magnolia javanica K. & V., Bijdr. 4 (1896) 315; Koord., Exk. Fl. Java 2 (1912) 239; Koord.-Schum., Syst. Verz. 1, Fam. 95 (1913) 2; K. & V., Atlas 4 (1918) t. 800; Rant, Nat. Tijdschr. Ned. Ind. 89 (1929) 446. – *Magnolia pealiana* (non King) K. & V., Bijdr. 4 (1896) 148, 314 (err. '*Pealii*'). – Lectotype: *Koorders 4520* (L; iso BO), Java.

Michelia beccariana Agostini, Atti Com. Accad. Fisiocrit. Siena IX, 7 (1926) sep. 23. – *Magnolia beccariana* (Agostini) Noot. in Whitmore & Tantra, Tree Fl. Indonesia, Sumatra Check List (1986) 141, nom. inval. – Type: *Beccari P. S. 116* (FI; iso BM, K, photo in L), Sumatra, Mt Singalan.

Magnolia aequinoctialis Dandy, Kew Bull. (1928) 185. – Type: *Houtvester Sumatra's Oostkust 25* (BO; iso L), Sumatra, Karolanden.

Shrub, treelet, or tree to 23 m (–50 m, once recorded) high by 43(–50) cm diam. Twigs long yellowish pubescent or pilose, or sometimes glabrous, glabrescent when older; stipules densely yellowish appressedly to patently long soft hairy, rarely nearly glabrous, 3–9 cm. *Leaves* appressedly or patently pubescent, especially on midrib and nerves, often glabrescent, or glabrous below, the midrib above sometimes hairy towards its base, ± elliptic to narrowly obovate, 12–25 by 3–9 cm; base acute; margin thickened, a vein running in the margin; apex (faintly) acuminate, acumen c. 5–15 mm; midrib much prominent below; nerves in 12–22 pairs, much prominent on the undersurface, less so above, curved upwards and meeting in an intramarginal vein which is prominent on both surfaces; reticulation densely netted and much prominent on both surfaces. Petiole glabrous or pubescent when young, 5–15 mm. *Flowerbuds* ellipsoid, glabrous or hairy, 1.5–3 cm long. Brachyblast appressedly pubescent, rarely (nearly) glabrous, often very slender, 2.5–8 cm long; pedicel absent; spathaceous bracts only one pair. *Outer tepals* three, 2–3 by c. 0.7–1.5 cm; inner tepals 6, in two rows, as long as or slightly shorter than outer ones, 5–10 mm broad. *Stamens* 20–many, filament 1.5–2 mm long, anthers 3.5–10 mm,

connective appendage triangular, acute, 2–3 mm long; carpels glabrous, glaucous, or yellowish tomentose, 15–c. 50, rarely fewer than 15. *Fruits* cylindric, distorted by the abortive carpels, c. 2.5 cm broad and up to 5 cm long, torus with scars of perianth and stamens 5–9 mm long.

Distribution. In Malesia: Sumatra, Malay Peninsula (Perak), Sabah, and Java.

Note. The flowers are creamy, the outer tepals more greenish.

a. var. *macklottii*

Magnolia macklottii (Korth.) Dandy – *Magnolia javanica* K. & V.

Leaves mostly elliptic. Flowerbuds and carpels glabrous.

Distribution. In Malesia: Sumatra W. coast, G. Singgalan (1 coll.) and Palembang (3 coll.); Borneo, Sabah, Tawau (1 coll.); W. Java (9 coll.).

Ecology. Very rare in primary vegetation from 80 to 1500 m altitude.

Vernacular names. Java: tjampacca gunung, t. rimbo.

b. var. *beccariana* (Agostini) Noot., *stat. et comb. nov.* – Fig. 4g, h.

Michelia beccariana Agostini – *Magnolia aequinoctialis* Dandy.

Leaves mostly narrowly obovate. Flowerbuds and carpels hairy.

Distribution. In Malesia: Sumatra (Atjeh, G. Leuser; Tapanuli; E. coast, Karolanden; W. coast, Padang, G. Singalan, G. Kerintji, 12 coll. in total, of which 6 from G. Leuser); Malay Peninsula (Perak, Maxwells Hill, 1 coll.).

Ecology. Very rare in the mountains from 1000 to 2600 m. Fl. Febr.–Aug., fr. May–June.

Note. The collection from Perak was identified as *M. maingayi* King. It rather belongs to *M. macklottii* var. *beccariana* but demonstrates the close affinity between the two taxa.

2. *Magnolia carsonii* Dandy ex Noot., *spec. nov.*

Carson's Magnolia W. Meijer, The Magnoliaceae of Sabah, Bot. Bull. Sandakan 11 (1968) 7, fig. – *Magnolia 'carsonii'* Dandy ex Cockburn, Sabah Forest Records 10 (1980) 56, t. 17, nomen.

Drymis-leaved Magnolia W. Meijer, op. cit. 8, fig. – *Magnolia 'drymifolia'* Dandy ex Cockburn, op. cit. 55, nomen.

Frutex vel arbor ad 60 m alta et 70 cm diametro ramulis glabris vel innovationibus pilosis gemmis apicalibus glabris vel pilosis. Folia glabra tenue vel crasse coriacea 4,5 ad 16 cm longa et 2,5 ad 6(–8) cm lata petiolo 6 ad 18 mm longo. Brachyblastus glaber vel pilosus 2 ad 5 cm longus bracteis glabris. Tepala exteriores 3, 15 ad 40 mm longa, tepala interiores 6. Stamina c. 15 ad 30, 7 ad 12 mm longa appendice 1 ad 3 mm longa. Fructus sessilis vel gynopodia ad 5 mm longa instructa carpellis 1 ad 15, glabris, cicatrice perianthi et staminorum 2 ad 3 mm longa. – T y p u s : SAN A 1680 (L; iso SING), Sabah, Ranau.

Shrub or tree to 60 m high and 70 cm diam.; twigs glabrous or hairy in innovations with apical buds glabrous or hairy. *Leaves* glabrous, thin or thick coriaceous 4.5–16 by 2.5–8 cm. Petiole 6 to 18 mm. Brachyblast glabrous or hairy, 2–5 mm long. *Outer tepals* 3(–4), 15–40 mm long; inner tepals 6. *Stamens* c. 15–30, 7–12 mm long with a connective appendage of 1–3 mm long. *Fruit* sessile or gynopodium to 5 mm long, carpels 1–15, glabrous; scars of perianth and stamens 2–3 mm along the torus.

Note. Dandy considered the two taxa as two species; in my opinion, however, they constitute one species. In his opinion Dandy was followed by Meijer and Cockburn, who, however, did not intend to publish them. The several intergradations between the two taxa were identified as *Magnolia spec.* by Dandy. They are provisionally put by me in var. *drymifolia*. Although they possess the glabrous buds of var. *carsonii*, in leaf characters they more resemble var. *drymifolia*.

KEY TO THE VARIETIES

- 1 a. Tree from 9 to 60 m, glabrous in all its parts except sometimes the inner margins of the terminal stipules. Leaves when dry rather dark reddish brown, darker above than beneath, thin coriaceous, 5–13 by 2.5–6 cm; nerves in 8–15 pairs; the larger alveoles filled with smaller ones from less prominent veins. Petiole 6–13 mm. Gynophore absent **a. var. carsonii**
- b. Shrub or tree to 25 m; twigs hairy directly under the terminal bud or glabrous; terminal buds hairy or sometimes glabrous. Leaves when dry olive greyish green or greyish brown on both surfaces, thick coriaceous, 4.5–9 by 2.5–4.5 cm; nerves in 6–12 pairs, all lesser veins forming a dense reticulation and no difference in alveoles, often the reticulation slightly obscured by the coriaceousness of the leaf and the undersurface glaucous. Petiole 10–18 mm. Gynophore 0–5 mm **b. var. drymifolia**

a. var. carsonii – Fig. 1, 4a, b.

Carson's Magnolia W. Meijer – *Magnolia 'carsoni'* Dandy ex Cockburn.

A big tree to 60 m tall and 60 cm diam.; twigs glabrous; stipules glabrous, up to 4 cm long, sometimes long silky on the inner margin. *Leaves* rather dark reddish brown, darker above than beneath, glabrous, elliptic, thin coriaceous, 5–13 by 2.5–6 cm; acumen abrupt 3–10 mm long; margin thickened, probably containing a vein; base cuneate; midrib prominent below; nerves in 8–12(–15) pairs, much prominent below, slightly less so above, curved upwards and meeting in an intramarginal vein; reticulation rather dense and prominent on both surfaces, secondary nerves 2–c. 4 about parallel with the nerves starting from the midrib and rather obvious from the lesser veins, the alveoles near the midrib oblong, the longest diameter parallel with nerves, the larger alveoles filled with the smaller ones of which the veins are less prominent. Petiole 6–13 mm. *Flowerbuds* c. 15–20 mm long, ovoid; brachyblast glabrous, 2.5–4 cm long, very slender; pedicel absent. Only one pair of spatheous

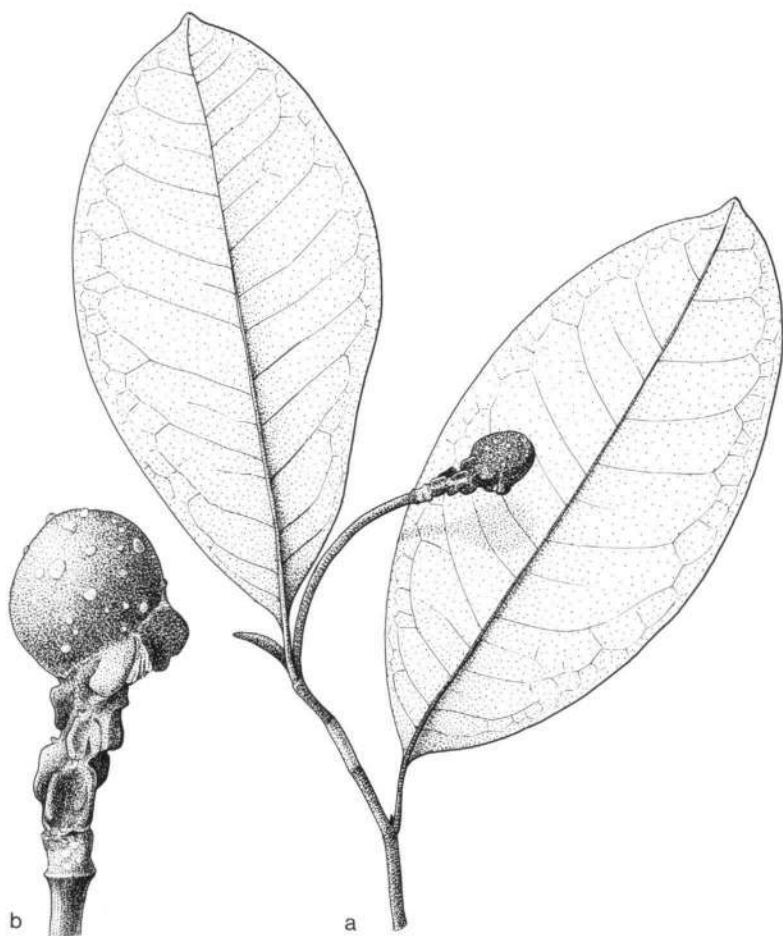


Fig. 1. *Magnolia carsonii* Dandy ex Noot. var. *carsonii*. — a. Habit, $\times 0.85$; b. fruit, $\times 2.5$ (Clemens 50271).

bracts. *Outer tepals* 3, 15–27 mm by c. 5 mm; *inner tepals* 6, about as long by 5–10 mm. *Stamens* 7–10 mm long, the 1–1.5 mm long connective appendage not included; gynophore absent; carpels glabrous, up to c. 15. *Fruits* with lenticels on the ripe carpels, often distorted by abortive carpels, mostly less than 10 carpels, sometimes only 1, fertile; scars of perianth and stamens along c. 2(–3) mm of the torus.

Distribution. In Malesia: Borneo (Sabah, Kinabalu, 18 coll., Crocker Ra., 1 coll.).

Ecology. Locally rather common, especially in Sosopodon Forest Reserve. Altitude 1200–1800 m. Fl., fr. probably Jan.–Dec.

b. var. *drymifolia* Noot., var. nov. – Fig. 2, 4c–f.

Drimys-leaved Magnolia W. Meijer – *Magnolia 'drymifolia'* Dandy ex Cockburn.

Frutex vel arbor ad 25 m alta gemmis apicalibus saepe pilosis. Folia saepe subtus glauca 4,5 ad 9 cm longa et 2,5 ad 4,5 cm lata petiolo 10 ad 18 cm longo. Fructus saepe gynophorum ad 5 mm longum instructus. – Typus: *Nootboom 4612* (L; iso BO), Borneo, Central Kalimantan, Bukit Raya.

Shrub (on exposed ridges) to tree of 25 m high; twigs hairy directly under the hairy terminal bud, soon glabrescent, or rarely entire plant glabrous; stipules hairy (or rarely glabrous) in the terminal bud, c. 15(–50) mm long, glabrous or hairy in lateral buds. *Leaves* olive greyish green or brown on both surfaces or the undersurface bluish, thick coriaceous, glabrous, (broadly) elliptic to sometimes obovate, glossy above, often glaucous underneath, 4.5–9(–16) by 2.5–4.5(–8) cm; apex not or hardly acuminate or sometimes emarginate, acumen up to 10 mm; margin

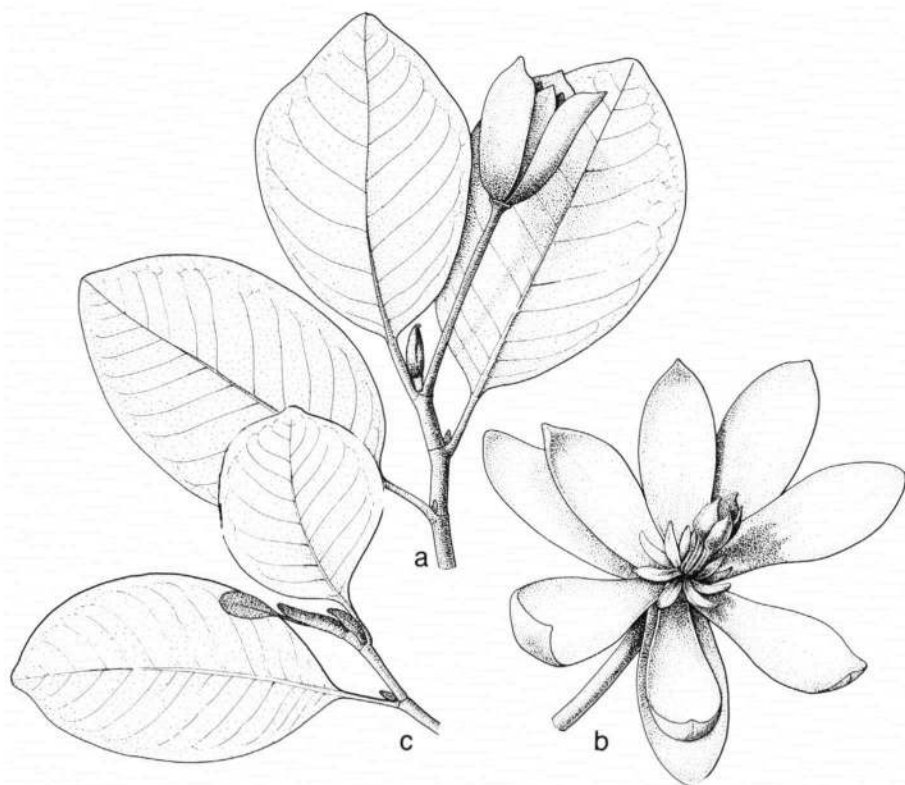
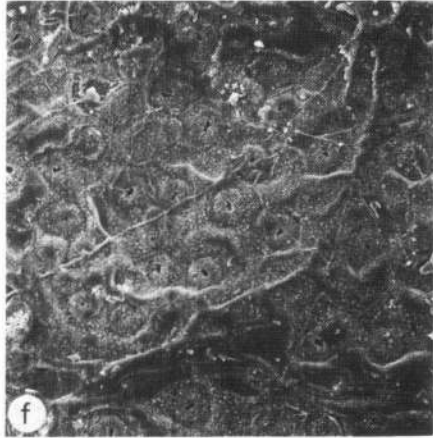
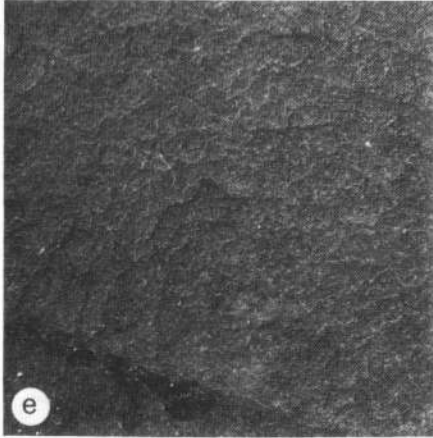
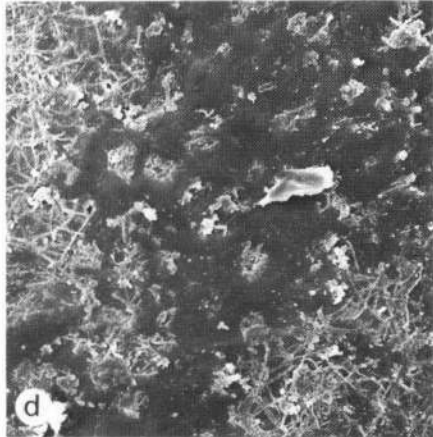
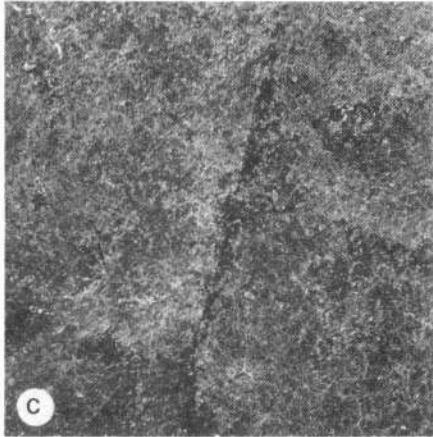
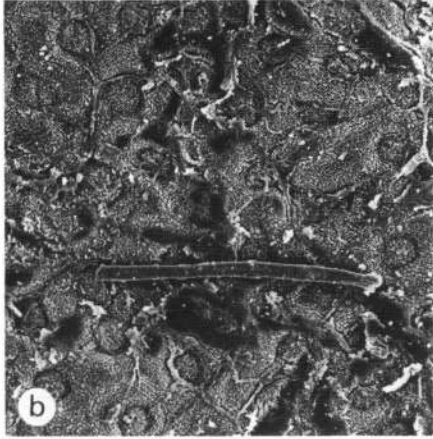
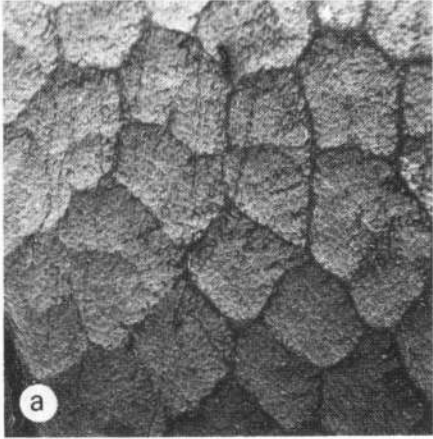


Fig. 2. *Magnolia carsonii* Dandy ex Noot. var. *drymifolia* Noot. – a. Habit, x 0.66; b. flower, x 1; c. reduced leaf from spathaceous bracts, x 0.66 (*Nootboom 4612*).



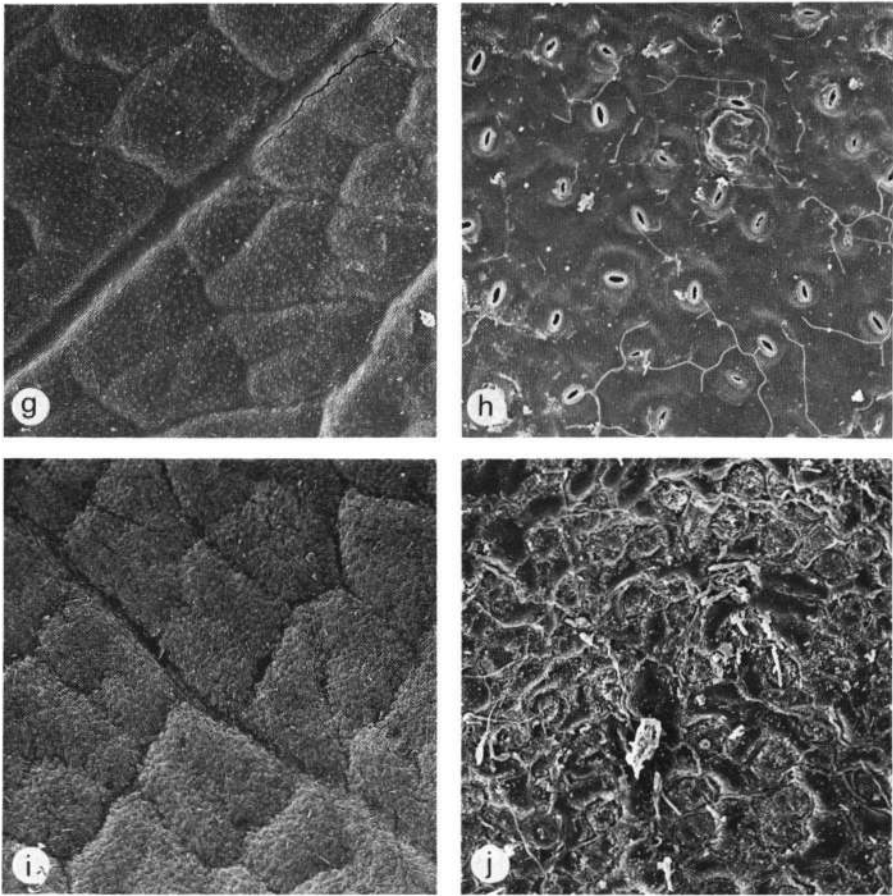
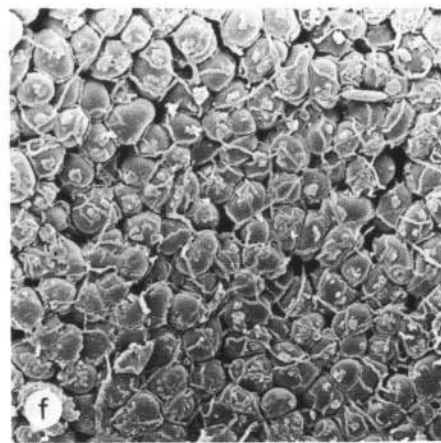
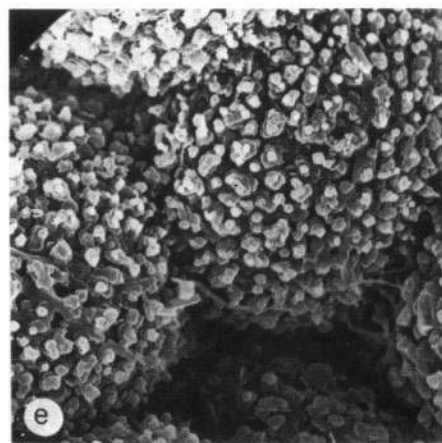
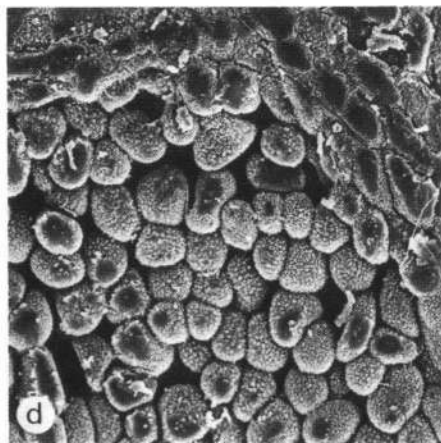
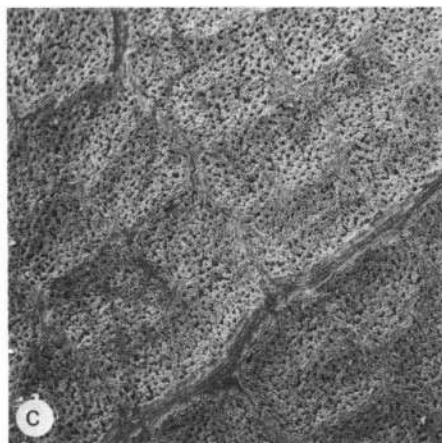
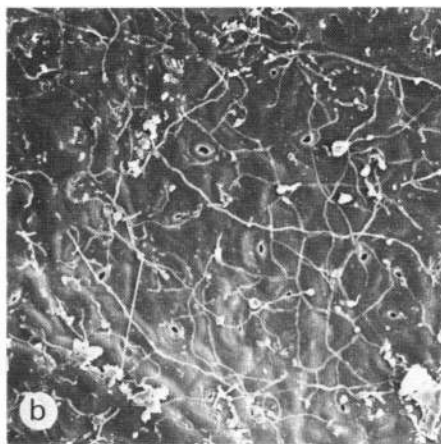
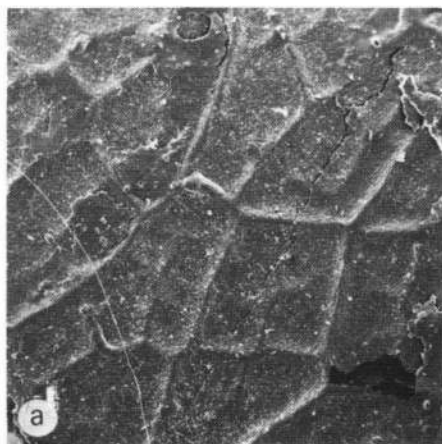


Fig. 3. Undersurfaces of the leaves of five species of section *Aromadendron*. – a. & b. *Magnolia ashtonii* Dandy ex Noot.: glabrous; stomata not or only faintly visible, covered by a granular waxy substance (S 12449). – c. & d. *M. bintuluensis* (Agostini) Noot.: glabrous, \pm glossy, or dull, a smooth or sometimes granular (like *M. ashtonii*) waxy layer covering the stomata, sometimes, however, letting them free (FRI bb 33049). – e. & f. *M. borneensis* Noot.: glabrous, dull-glossy, a granular waxy layer surrounding and sometimes covering the very many stomata, the latter always clearly visible, mostly at least the pore left free (Paymans 173). – g. & h. *M. elegans* (Blume) H.Keng: glabrous, somewhat glossy, no waxy layer present (except in the formerly as var. *glauca* described specimens which have a glaucous undersurface); stomata often with a hand lens faintly visible (KEP/FRI 21950). – i. & j. *M. pahangensis* Noot.: glabrous; glaucous, a granular waxy layer covering the undersurface, obscuring the very many stomata which lie somewhat deeper than the surface (KEP/FRI 9030). – a, c, e, g, i \times 20, b, d, f, h, j \times 200.



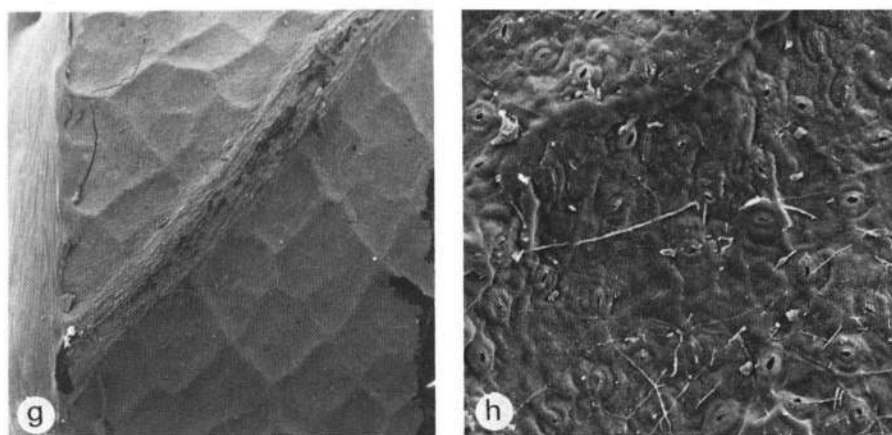
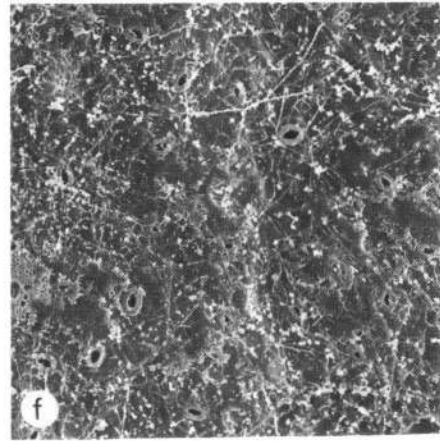
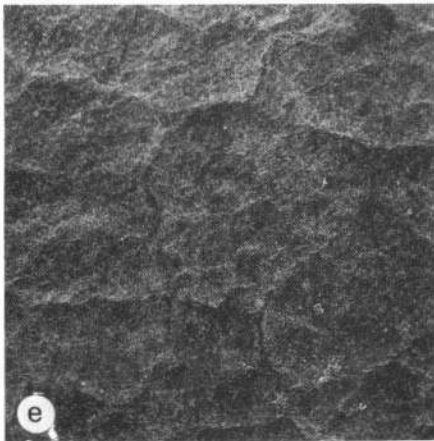
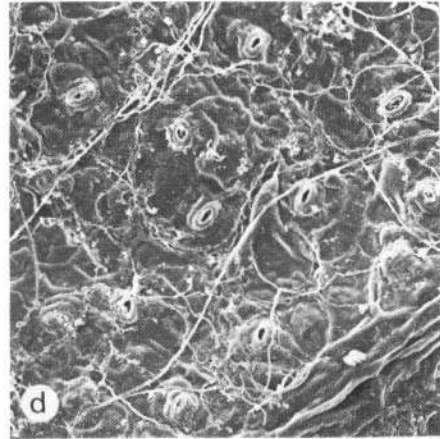
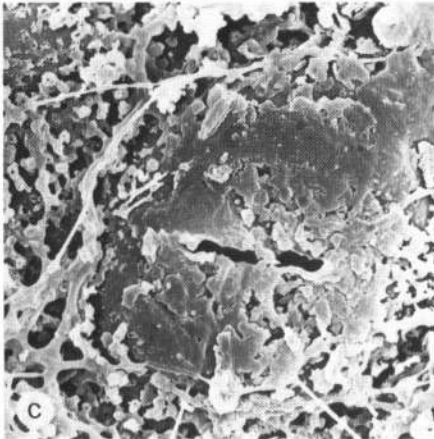
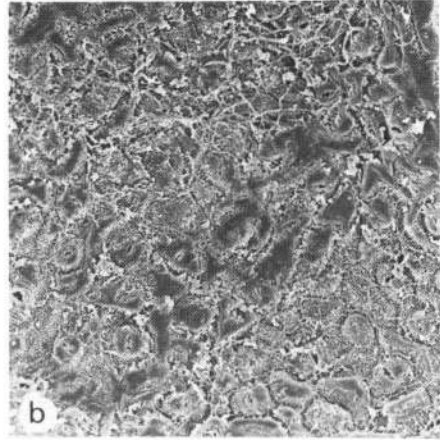
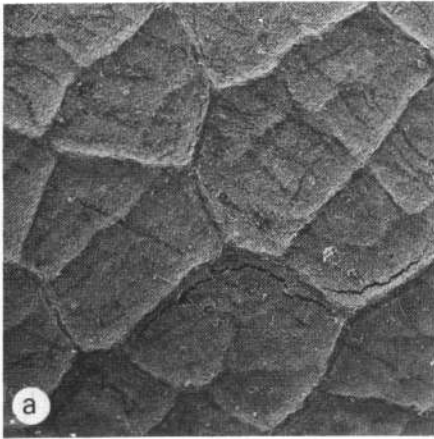


Fig. 4. Undersurfaces of the leaves of three species/varieties of section *Maingola*. – a. & b. *Magnolia carsonii* Dandy ex Noot. var. *carsonii*: glabrous; further like *M. elegans* (Fig. 3g & h) (Clemens 50508). – c–f. *M. carsonii* var. *drymifolia* Noot.: glabrous; cells around the stomata raised to papillae, which sometimes even obscure the reticulation; the papillae covered by flaky wax; f. as d, but the wax removed by boiling in water (Nootboom 4612). – g. & h. *M. macklottii* (Korth.) Dandy var. *beccariana* (Agostini) Noot.: as *M. elegans* (Fig. 3g & h), but mostly haired (de Wilde 15454); var. *macklottii* is similar. – a, c, g \times 20, b, d, h \times 200, e \times 2000.

thickened containing a vein; base cuneate, slightly attenuate; midrib much prominent beneath; nerves in 6–12 pairs, curved upwards and meeting in an intramarginal vein; all lesser veins forming together a dense reticulation, prominent above, slightly obscured by the coriaceousness of the leaves below, the alveoles along the midrib mostly about isodiametric. Petiole 10–18 mm. *Flowers* erect, brachyblast stout, densely appressedly pubescent or pilose to nearly glabrous or more slender and glabrous, (2–)3–5 cm; pedicle 0–1.5 mm, when present densely appressedly pubescent; spathaceous bracts glabrous, only 1 pair. *Outer tepals* 3, greenish, 2–4 by c. 1 cm; inner tepals yellow, 6, c. 13–35 by 10 mm. *Stamens* up to c. 30, filament 1–3 mm, anthers 4–8 mm, connective appendage 1–2 mm; gynophore 2–5 mm or rarely absent; carpels very few (3–5 in my own collections from Bukit Raya), probably never more than 10, glabrous. *Fruits* without or with only few small lenticels, scars of perianth and stamens along 3 mm of the torus; seeds 1 or 2.

Distribution. In Malesia: Borneo (Sarawak, 6 coll., Sabah, Crocker Ra., 1 coll. and Kinabalu, 17 coll.; W. Kalimantan, 1 coll.; Central Kalimantan, 1 coll.; E. Kalimantan, Mt Palimasan, 1 coll.).

Ecology. Primary and secondary mountain forest between 1000 and 2850 m altitude. Fl., fr. probably Jan.–Dec.



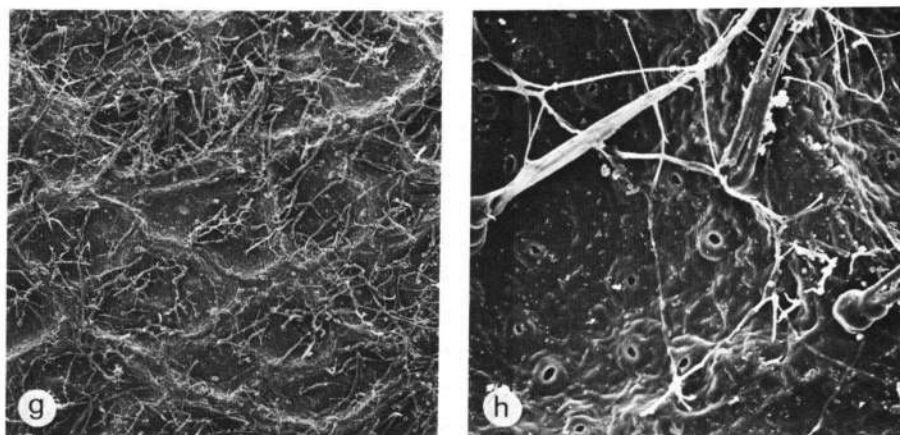


Fig. 5. Undersurfaces of the leaves of three species of section *Maingola*. – a–d. *Magnolia maingayi* King: usually woolly hairy, glabrescent (here a glabrous leaf is chosen), glaucous, especially between the stomata covered by a granular layer of wax, but often also on the stomata where that layer coagulates; the stomata, however, always distinct; some specimens slightly glossy like *M. elegans*, apparently no waxy layer present; c. stoma; d. as b, but wax removed by boiling in water. – e. & f. *M. phaulantha* Dandy ex Noot.: glabrous, more or less glossy, waxy layer absent or only on few places (FRI bb 29194). – g. & h. *M. uvariifolia* Dandy ex Noot.: ± pubescent, glabrescent, dull or slightly glossy, more or less like *M. elegans* (Fig. 3g & h) (Clemens 28753). – a, e, g x 20, b, f, h x 200, c x 2000.

3. *Magnolia maingayi* King – Fig. 5a–d.

Magnolia maingayi King, J. As. Soc. Beng. 58, ii (1889) 369; Ann. Bot. Gard. Calcutta 3 (1891) 208, t. 45 B; C. Curtis, J. Str. Br. Roy. As. Soc. 25 (1894) 71; Cat. Fl. Pl. Penang (1894) 5; Finet & Gagnep., Bull. Soc. Bot. Fr. Mém. 4 (1906) 36; Rhed. & Wilson in Sarg., Pl. Wils. 1 (1913) 407; Ridley, Enum. Born. (1913) 72; Merr., Enum. Born. (1921) 251, excl. coll. *Beccari* 2661, 3660; Ridley, Fl. Mal. Pen. 1 (1922) 13; Burkill, Dict. (1935) 1393; W. Meijer, Bot. Bull. Sabah 11 (1968) 9; Cockburn, Sabah Forest Records 10 (1980) 55. – Type: *Maingay* 17 (?; iso L), Penang.

Treelet or tree from 1.2 to 18 m, to 50 cm diam.; twigs, terminal buds, and petioles densely woolly hairy; stipules to 5 cm long. *Leaves* long hairy below, especially on midrib and nerves, glabrescent, glabrous above, obovate to narrowly obovate or rarely elliptic, 9–26 by 3–9(–11) cm; apex abruptly acuminate, acumen 5–25 mm; margin thickened, containing a vein; base cuneate to more or less rounded; midrib much prominent below; nerves in 14–18 pairs, meeting in an intramarginal vein; reticulation prominent below, slightly so above. Petiole 3–5(–15) mm. Brachyblast densely hairy, 1–5 cm; pedicle absent. *Flowerbud* 3–4 cm, long hairy with only one pair of bracts. *Outer tepals* 3, 20–40 by 10–12 mm; *inner tepals* 6, thick coriaceous, 20–25 by 10 mm. *Stamens* many, filament c. 1 mm, anthers 5–6(–8) mm, connective appendage triangular, not very acute, tip often blunt, c. 1.5–2 mm long;

gynophore absent; carpels many, densely (woolly) hairy. *Fruits* hairy, cylindrical, c. 5(–8) by 2–3 cm, sometimes much shorter by abortion of the carpels, scars of perianth and stamens along 10(–15) mm of the torus.

Distribution. In Malesia: Malay Peninsula (Penang, 4 coll.; Perak, 5 coll.; Pahang, 6 coll.; Selangor, Kepong, 1 coll.; Johore, 2 coll.; Singapore, 5 coll.); Borneo (Sarawak, 1 coll., Kapit, 1 coll., Ulu Mojong, 3rd Div., 1 coll., Bario, Kelabit Plateau, 2 coll.; Sabah, Kinabalu, 1 coll.).

Ecology. In forest from low altitude to 1500 m. Fl., fr. Jan.–Dec.

Vernacular name. Borneo: analwei, leka (Kelabit).

4. *Magnolia uvariifolia* Dandy ex Noot., *spec. nov.* – Fig. 5g, h, 6.

Uvaria-leaved Magnolia W. Meijer, Bot. Bull. Sandakan 11 (1968) 9. – *Magnolia* '*uvariifolia*' (sic!) Dandy ex Cockburn, Sabah Forest Records 10 (1980) 55, nomen.

Arbor parva vel mediocris ad 25 m alta et 35 cm diametro ramulis gemmis apicalibusque lanatis glabrescentibus foliis infra pilosis glabrescentibus obovatis vel anguste obovatis 10 ad 28 cm longis et 3,5 ad 9 cm latis venis lateralis 13 ad 19 paribus in venam intramarginalem convenientibus reticulatione dense patenter reticulato petiole 3 ad 13 mm longo. Brachyblastus pilosus, glabrescens, 4,5 ad 11 cm longus. Tepala exteriores 3, 35 ad 40 mm longa, tepala interiores 6, ca. 30 mm longa. Stamina multa ca. 6 mm longa appendice ca. 5 mm longa instructa. Carpella multa, glabra. Cicatrix perianthi et staminorum 10 ad 20 mm longa. – *T y p u s:* *Clemens* 28439 (L; iso BO, NY), Kinabalu, Tenompok, 5000 ft.

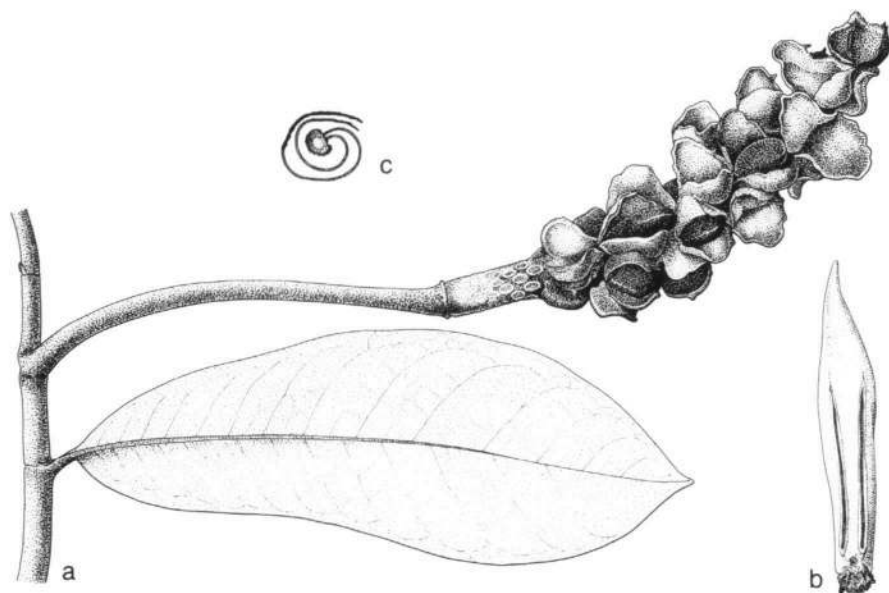


Fig. 6. *Magnolia uvariifolia* Dandy ex Noot. – a. Habit with fruit, $\times 0.6$ (*Clemens* 28439); b. stamen, $\times 3.6$ (*Clemens* 28753); c. convolute leaf in bud (*Clemens* 26985).

Treelet or tree from 6 to 25 m, up to 35 cm diam.; twigs and terminal buds yellowish woolly; stipules to 3 cm. *Leaves* pubescent beneath, especially on midrib and nerves, glabrescent, obovate to narrowly obovate, 10–28 by 3.5–9 cm; apex acuminate, acumen 3–15 mm; margin thickened, containing a vein; base cuneate rounded; nerves in 13–19 pairs, prominent below and less so above, meeting in an intramarginal vein; reticulation dense, much prominent below, less so above. Petiole with same indument as twigs, 3–13 mm. Brachyblast pilose, glabrescent, 4.5–11 cm, pedicle absent; bracts in one pair only, glabrous. *Flowerbud* 3–4 cm long. *Outer tepals* 3, c. 35–40 by 15 mm; inner tepals 6, thick coriaceous, c. 30 by 10 mm; stamens very many, filament c. 1 mm, anthers c. 5 mm, the connective appendage acute, c. 5 mm long; gynophore absent; carpels very many, glabrous. *Fruits* cylindrical, c. 7–14 by 2–3 cm; scars of perianth and stamens along 10–20 mm of the torus.

Distribution. In Malesia: Borneo (Sarawak, Kapit, 3rd Div., 1 coll., Sabah, G. Alab, 1 coll., Tambunan, 1 coll., Penampang, 1 coll., Kinabalu, c. 20 coll., SE. Kalimantan, Berouw, 1 coll.).

Ecology. Primary or secondary forest 180–1800 m alt. Fl., fr. Jan.–Dec.

Vernacular name. Borneo: karampilung (SE. Kalimantan).

Note. This species is closely related to *M. maingayi* which, however, differs in the mostly longer and denser indument and flowerbuds and carpels being hairy.

5. *Magnolia phaulanta* Dandy ex Noot., *spec. nov.* – Fig. 5e, f.

Arbor ad 30 m alta et 50 cm diametro, glabra, foliis (anguste) ellipticis vel pauce obovatis 6 ad 15 cm longis et 2,5 ad 4,5 cm latis venis primariis ca. 10 paribus reticulatione dense prominente petiolo 5 ad 10 mm longo. Brachyblastus gracilis, glaber, 2,5 ad 4 cm longus pedicelli absente bracteis glabris. Tepala exteriores 3, ca. 15 mm longa et ca. 3 mm lata; tepala interiores 6 ad 7, paulo longiora. Stamina ca. 5 mm longa appendice ad 1 mm longa. Carpella pauca. Fructus sessilis carpellis fertilibus 1 ad 2? – Typus: *FRI bb 29194* (L; iso A, SING), Celebes, Rantelemo.

Tree to at least 30 m by 50 cm diam., entirely glabrous; stipules c. 2–4 cm (but sometimes the inner margins long hairy). *Leaves* (narrowly) elliptic to slightly obovate, 6–15 by 2.5–4.5 cm; (abruptly) acuminate, acumen 3–20 mm; margin thickened, containing a vein; base cuneate, decurrent into the petiole, midrib much prominent beneath; nerves in c. 10 pairs, hardly distinct from the dense reticulation which is prominent on both surfaces. Petiole c. 5–10 mm. Brachyblast very slender, 2.5–4 cm; pedicle absent. *Flowerbuds* glabrous. *Outer tepals* 3, c. 15 by 2 mm; inner tepals 6–7, slightly longer. *Stamens* many, filament very short, anthers c. 5 mm long, connective appendage to c. 1 mm long; gynophore absent; carpels less than 10, glabrous. *Fruits* often with only one or two developed carpels, c. 1 by 1 cm.

Distribution. In Malesia: Celebes (Central, 9 coll., Masamba, Malili, Rantelemo, Rantepao, Palu).

Ecology. Mountain forest between 1250 and 2200 m altitude. Fl. Apr.–Dec.

Note. This species resembles *M. carsonii* (var. *carsonii*) very much and might turn out to be conspecific with it.

Subgenus *Talauma*

Subg. *Talauma* (Juss.) Pierre, Fl. For. Cochinch. 1 (1881) sub t.1; Noot., Blumea 31 (1985) 89.

Trees or shrubs. Stipules adnate to or free from the petiole. Tepals 9–36, subequal. Anthers introrse, connective produced into a short to very long (even longer than the anther) appendage. Gynaecium sessile or with a gynophore to 10 mm. Carpels many to few, concrescent at least at the base; fruiting carpels woody, circumcissile, the upper portions falling away either singly or in irregular masses, the lower portions persistent with the suspended seeds.

Note. The typical species of this subgenus form a small group confined to the West Indies and South America, characterized by the completely concrescent carpels which in fruit dehisce in irregular masses. This is also the case in section *Aromadendron*, which, however, has the stipules free from the petiole. In other American species the carpels are united only at the base and dehisce singly, becoming bifid at the apex. The species in section *Blumiana* (including the Malesian ones) have the carpels concrescent only at the base and dehisce singly, not becoming bifid.

2. Section *Aromadendron*

Sect. *Aromadendron* (Blume) Noot., Blumea 31 (1985) 89. — *Aromadendron* Blume, Bijdr. (1825) 10.

Stipules free from the petiole. Outer tepals three or more often four, inner tepals 8–32. Stamens with a connective appendage that is in most species very long, from slightly shorter to longer than the anthers, but in *M. ashtonii* it is triangular and only 2.5 mm long. Fruit a fleshy syncarp, often on a gynophore of c. 5 to rarely 10 mm long, the carpels falling off when ripe in irregular masses thus exposing the seeds which hang from the torus. Seeds 1–2 in each carpel.

Distribution. In Malesia: Sumatra, Malay Peninsula, Java, Borneo, Philippines (Palawan).

KEY TO THE SPECIES

- 1 a. Leaves 4.5–7.5 by 1.5–3.5 cm. Petiole 7–10 mm. Carpels c. 6
 - 10. *M. pahangensis*
- b. Leaves longer than 7.5 cm. Petiole 8–50 mm. Carpels more than 6 2
- 2 a. Nerves in 8–12 pairs. Pedicle absent. Fruit ellipsoid, 3–4.5 by 2–3.5 cm.
 Gynophore absent. Scars of perianth and stamens along up to 3 mm of the torus
 7. *M. bintuluensis*
- b. Nerves in 11–20 pairs. Pedicle 2–10 mm. Fruit 5–9 by 3–5 cm. Gynophore
 0–10 mm. Scars of perianth and stamens along 5 mm of the torus 3
- 3 a. Nerves in (12–)15–20 pairs. Petiole 25–50 mm. Fruits ovoid to pear-shaped,
 8–9 by 4–5 cm 8. *M. ashtonii*
- b. Nerves in 11–16 pairs. Petiole 8–25 mm. Fruit 5–7 by 3–5 mm 4
- 4 a. Tepals 18–36 6. *M. elegans*
- b. Tepals 12 9. *M. borneensis*

6. *Magnolia elegans* (Blume) H. Keng – Fig. 3g, h.

Magnolia elegans (Blume) H. Keng, Gard. Bull. Sing. 31 (1978) 129; Noot. in Whitmore & Tantra, Tree Fl. Indonesia, Sumatra Check List (1986) 141. – *Aromadendron elegans* Blume, Bijdr. (1825) 10; Fl. Java Magnol. (1829) 26, t. 7, 8; Moritz, Syst. Verz. Zoll. (1846) 36; Korth., Ned. Kruidk. Arch. 2, Versl. (1851) 97; Miq., Fl. Ind. Bat. 1, 2 (1858) 16; Ridley, Fl. Mal. Pen. 1 (1922) 17, f. 3; Burkill, Gard. Bull. Str. Settl. 6 (1930) 454; Dict. (1935) 241; Backer & Bakh.f., Fl. Java 1 (1963) 98. – *Talauma elegans* (Blume) Miq., Ann. Mus. Bot. Lugd. Bat. 4 (1868) 70; K. & V. Meded. Lands Plantentuin 17 (1896) 167; Ridley, J. Str. Br. Roy. As. Soc. 33 (1900) 38; Backer, Schoolfl. Java (1911) 13; Koord., Exk. Fl. Java 2 (1912) 239; Koord.-Schum., Syst. Verz. 1, Fam. 95 (1913) 4; Baker f., J. Bot. 62, Suppl. (1924) 2 (excl. parte); ibid. 64, Suppl. 1 (1926) 142. – Type: *Blume 215* (L; iso BO), Java.

Aromadendron glaucum Korth., Ned. Kruidk. Arch. 2, Versl. (1851) 98. – *Talauma glaucum* (Korth.) Miq., Ann. Mus. Bot. Lugd. Bat. 4 (1868) 70 (excl. syn. *Manglietia oortii*). – *Magnolia glauca* (Korth.) Pierre, Fl. For. Cochinch. 1 (1881) sub t. 2, non *Magnolia glauca* L. (1759). – *Talauma elegans* var. *glauca* (Korth.) P. Parm., Bull. Sc. Fr. Belg. 27 (1896) 277, 336. – *Aromadendron elegans* var. *glauca* (Korth.) Dandy, Kew Bull. (1928) 183. – Type: *Korthals* (L, sheet 908.126-1108; iso NY), Sumatra.

Manglietia oortii Korth., Ned. Kruidk. Arch. 2, Versl. (1851) 97; Miq., Fl. Ind. Bat. 1, 2 (1858) 15; ibid. Suppl. 1 (1860) 153, excl. coll. Teijsmann. – Type: *Korthals* (L, sheet nr. 908.126-1138; iso NY), Singalan.

Tree to 40(–53) m high and 80(–115) cm diam.; twigs glabrous, brown or blackish brown provided with many sometimes light coloured annular stipular scars; stipules glabrous but with a tuft of hairs at the apex, 2–3.5(–5) cm long, the inner margins sometimes beset with long white hairs. *Leaves* glabrous, glossy but rarely the undersurface glaucous ('var. *glauca*'), mostly narrowly elliptic, sometimes elliptic, 7.5–22(–27) by 3–6(–8) cm; base cuneate to sometimes rounded, decurrent into two ridges on the petiole; margin thickened, containing a vein; apex acuminate, acumen 3–20 mm; midrib much prominent below; nerves in 11–16 pairs curved upwards and meeting in a looped intramarginal vein which is prominent on both under and upper surface but on the upper surface hardly distinct from the venation; reticulation densely netted, prominent on both surfaces, the marginal vein included in the reticulation. Petiole 8–20(–25) mm. Brachyblast glabrous, 3–5(–6) cm long; spatheaceous bracts one pair, c. 6 cm long, glabrous but with some hairs apically. *Flowerbuds* before opening narrowly ellipsoid or ovoid, often narrowed to the base, c. 4.5–6 by c. 1.5 cm; pedicle glabrous, c. 5(–10) mm, often in N. Sumatra and the Malay Peninsula nearly absent. *Tepals* c. 18–36, the 4 outer sepaloid ones light yellowish green in vivo, narrowly obovate or mostly elliptic, the longest c. 4–7 cm long and up to 1.5(–1.8) cm broad, the others white, narrowly elliptic, slightly shorter and much narrower. *Stamens* 60–70, filament c. 0.5 mm, anthers 8–9 mm, the connective produced in a long setaceous, 12–15 mm long appendage; a short gynophore present between stamens and carpels, the latter connate in fruit. *Fruits* ellipsoid to orbicular, c. 5–7 cm long and c. 3–5 cm diam., tepal and staminal scars along c. 5 mm of the torus, gynophore also c. 5 mm long, but rarely shorter to nearly absent.

Distribution. Malesia: Sumatra (incl. Banka), Malay Peninsula (Penang, Selangor, Perak, Singapore), W. Java.

Ecology. Common, mostly in lowland rainforest but in Sumatra also to 1200 and in Atjeh (G. Leuser) to 1850 m, in Java up to 1200 m altitude. Fl., fr. Jan.–Dec.

Vernacular names. Sumatra: jelatan bulan, kayu sulung, kedondong tunjuk, medang mempau, m. pauh, (M), utup-utup (Batak).

Note. According to Dandy (1928: 188) the labels of the Korthals collections were confused and he reduced *Manglietia oortii* Korthals to *Manglietia glauca* var. *sumatрана*. Korthals wrote on two different collections from Mt Singalan *Manglietia oortii*. One he later changed to *Manglietia macklottii*. This is the type collection of that species and is depicted (as also stated on the sheet) by Oort. This picture is in the icones collection of L under the name of *Michelia oortii*. The other, with the leaves glaucous underneath as stated in the original description (Foliis ... subtus glaucis) is the type of *Manglietia oortii* Korthals and belongs to *Magnolia elegans* despite a slight difference between the flowers and their description by Korthals, which is very obscure anyhow.

7. *Magnolia bintuluensis* (Agostini) Noot., *comb. nov.* – Fig. 3c, d.

Magnolia bintuluensis (Agostini) Noot. in Whitmore & Tantra, Tree Fl. Indonesia, Sumatra Check List (1986) 141, nom. inval. – *Talauma bintuluensis* Agostini, Atti Com. Accad. Fisiocrit. Siena IX, 7 (1926) sep. 26; Noot. in Whitmore & Tantra, Tree Fl. Indonesia, Sumatra Checklist (1986) 143. – Type: *Beccari P.S. 2661* (FI; iso K); paratype: *Beccari P.S. 3660*, Sarawak, Bintulu.

Aromadendron nutans Dandy, Kew Bull. (1928) 183; W. Meijer, Bot. Bull. Sandakan 11 (1968) 5; Cockburn, Sabah Forest Records 10 (1980) 53, t. 16. – *Magnolia nutans* (Dandy) H. Keng, Gard. Bull. Sing. 31 (1978) 129. – *Magnolia maingayi* auct. non King; Ridley, Enum. Born. (1913) 72, p.p.; Merr., Enum. Born. (1921) 251, p.p. – Type: *Beccari P.S. 3660* (K; iso FI), Sarawak.

Tree 6–25 m by 15–62 cm; twigs glabrous, wrinkled; terminal buds glabrous, sometimes with a tuft of hairs apically, 1.5–2 cm; stipules glabrous but the inner margin provided with long hairs, 15 mm long. *Leaves* coriaceous, glabrous, mostly dull, the undersurface sometimes glaucous, obovate or sometimes elliptic, 8.5–18 by 3–7.5 cm; abruptly acuminate with rounded tip, acumen c. 5–10 mm; margin thickened, probably containing a vein; base cuneate, decurrent into two ridges on the petiole; midrib much prominent below; nerves prominent on the undersurface and less so above, in 8–12 pairs, meeting in an intramarginal vein which is rather inconspicuous on the upper surface, often a second less conspicuous intramarginal vein closer to the margin present; reticulation prominent on the undersurface but less so above, the smaller nerves obscured because the leaves are coriaceous and thus the reticulation rather coarse. Petiole 10–25 mm. *Flowerbuds* ovoid, c. 2 cm long. Brachyblast 1–3 cm, mostly curved, often terminating a twig of which the upper leaves are reduced or fallen; pedicle absent; spathaceous bracts glabrous, direct under the flower. *Outer tepals* 3, linear oblong c. 2 cm long; inner tepals c. 15. *Stamens* 10–12 mm, provided with a connective appendage of hardly the same length; gynophore absent. *Fruits* ellipsoid, c. 3–4.5 by 2–3.5 cm, no pedicle or gynophore. Scars of perianth and stamens along c. 3 mm of the torus.

Distribution. In Malesia: Sumatra (Indragiri, Biliton), Malay Peninsula (Johore), Borneo (Sarawak, Brunei, Sabah, Kalimantan).

Ecology. Rare, 21 collections in total. As far as recorded often in (coastal) swamp, kerangas, in E. Kalimantan in *Agathis* forest on sandy waterlogged soil. Altitude 0–1000 m. Fr. Febr.–Sept.

Vernacular names. Sumatra: kedondong kijai; Borneo: medang pelam (W. Kalimantan), triburus (Sarawak, Land Dyak).

Note. Flowers are only known from the type. Therefore I used the descriptions of Agostini and Dandy for describing the flowers.

8. *Magnolia ashtonii* Dandy ex Noot., *spec. nov.* – Fig. 3a, b, 7.

Ashton's Aromadendron W. Meijer, Bot. Bull. Sandakan 11 (1968) 5, fig. – *Aromadendron 'ashtonii'* Dandy ex Cockburn, Sabah Forest Records 10 (1980) 53, nomen. – *Magnolia ashtonii* Noot. in Whitmore & Tantra, Tree Fl. Indonesia, Sumatra Check List (1986) 141, nomen.

Arbor magna ramulis glabris gemmis apicalibus ellipticis 2 ad 3 cm longis glabris stipulis glabris. Folia glabra pagina infra dense puncticulata nervis primariis 15 ad 20 paribus venis reticulatis petiolo 2,5 ad 5 cm longo. Brachyblastus glaber 2,5 ad 3 cm (ad 4 cm in fructu) longus pedicello glabro 7 ad 8 mm longo. Tepala exteriores 4, ca. lineares, 5 × 0,6 ad 0,8 cm, tepala interiores 8, 4,5 × 0,6–1 cm. Stamina ca. 50, filamentum ca. 1 mm longo antheris 9 ad 10 mm longis appendice triangulata ca. 2,5 mm longa. Fructus ellipsoideus, ovoideus vel pyriformis, 8 ad 9 × ca. 4 cm, pedicello, cicatrice perianthi et staminorum, et gynophoro omnibus c. 5 mm longibus (vel gynophoro ad 10 mm longo). – **Typus:** S 7895 *Ashton* (L; iso A, K, SING), Brunei, Bukit Teraja.

Tree up to 45 m high and 60 cm diam. Twigs glabrous, rather thick, terminal buds ellipsoid, glabrous, c. 2–3 cm long, sometimes with a tuft of hairs on the apex; stipules glabrous, c. 2 cm. *Leaves* glabrous, the under surface densely punctulate, often glaucous, obovate, 12–23 by 5–10 cm; acumen abruptly shortly acuminate with blunt tip, 3–7 mm; margin thickened, containing a vein; base acute, decurrent with two ridges into the petiole, the ridges obscure towards the base; midrib much prominent on the under surface; nerves in 15–20 pairs, distinct on both surfaces, slightly prominent below, hardly or not above; reticulation distinct, fine, but hardly prominent on both surfaces. Petiole 2.5–5 cm, often thickened towards the base. Brachyblast glabrous, 2.5–3 cm (–4 cm in fruit); pedicle glabrous, 7–8 mm. Spathaceous bracts not seen. *Outer tepals* 4, about linear, 5 by 0.6–0.8 cm; inner tepals 8, linear, 4.5 by 1 (the outermost) to 0.6 (the innermost) cm. *Stamens* c. 50, filament c. 1 mm, anthers 9–10 mm, connective appendage about triangular, c. 2.5 mm long; gynophore distinct; carpels many (more than 100). *Fruits* ellipsoid, ovoid, or pear-shaped, 8–9 by c. 4 cm, pedicle, scars of perianth and stamens, and gynophore all c. 5 mm long or gynophore up to 10 mm.

Distribution. In Malesia: Sumatra (Riouw, Indragiri), Borneo (Sarawak, Brunei, Sabah, W. Kalimantan).

Ecology. Very rare (only 8 collections) on yellow sandy soil (once recorded). Fl. May–June, fr. Aug.–Sept. (both twice recorded). Altitude up to 500 m.

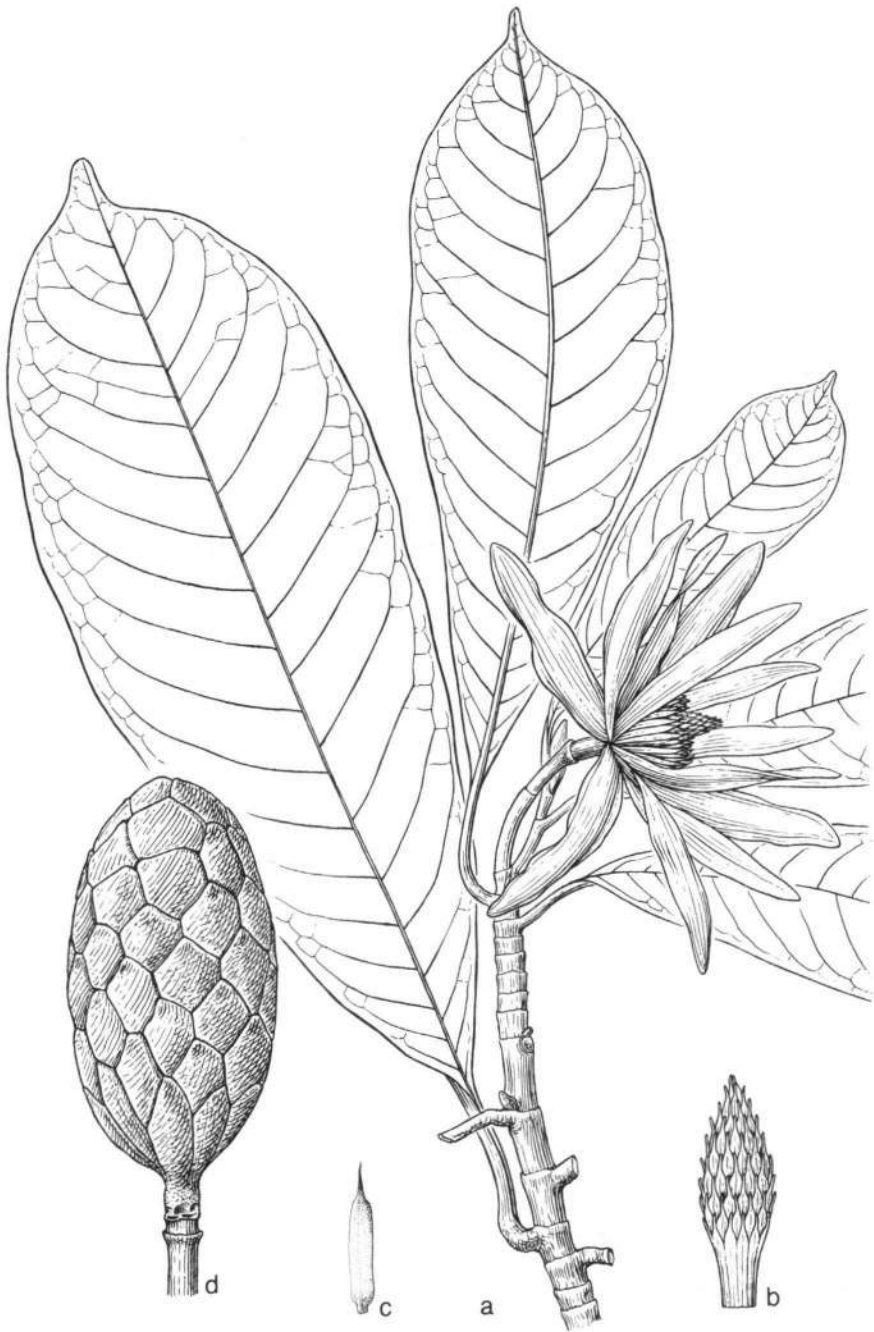


Fig. 7. *Magnolia ashtonii* Dandy ex Noot. — a. Habit with flower, $\times 0.6$ (S 7895 Ashton); b. ovary, $\times 1.85$ (BRUN 5503); c. anther, $\times 1.85$ (S 7895 Ashton); d. fruit, $\times 0.6$ (S 12449).

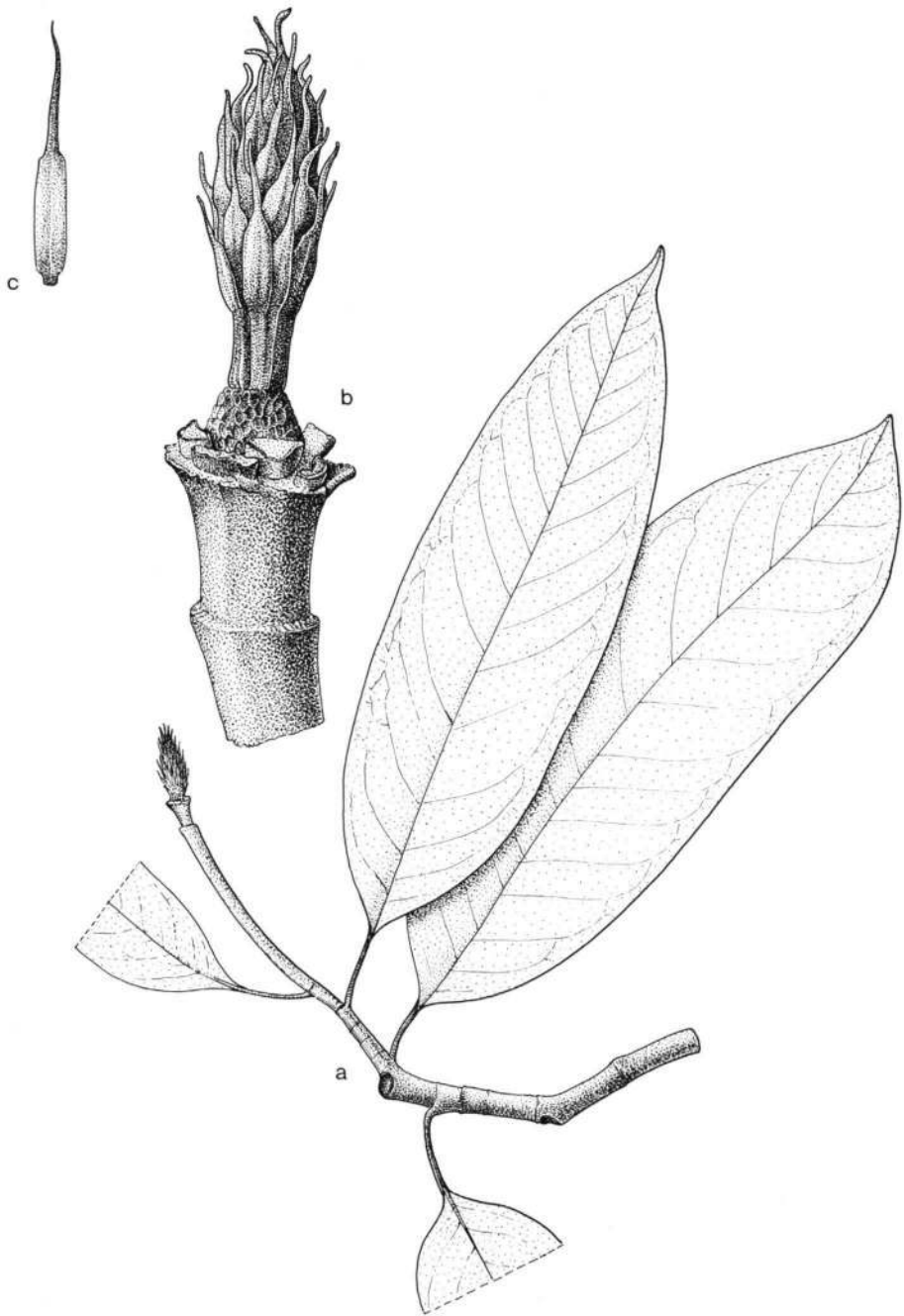


Fig. 8. *Magnolia borneensis* Noot. – a. Habit, x 0.85; b. ovary, x 5; c. stamen, x 1.7 (Paymans 173).

9. *Magnolia borneensis* Noot., *spec. nov.* — Fig. 3e, f, 8.

Borneo Aromadendron W. Meijer, Bot. Bull. Sandakan 11 (1968) 5. — *Aromadendron 'borneensis'* Dandy ex Cockburn, Sabah Forest Records 10 (1980) 53, nomen

Arbor ad 40 m alta et 112 cm diametro ramulis glabris gemmis apicalibus glabris stipulis glabris 2 ad 3,5 cm longis. Folia glabra anguste elliptica 7,5 ad 21 x 3,5 ad 6 cm apice acuminato acumine 7 ad 10 (ad 15) mm longo margine crasso venis primariis 11 ad 16 paribus reticulatione densissimo saepe vix prominente superficie leve petiolo 12 ad 17 mm longo. Brachyblastus glaber 3 ad 5 cm longus pedicello 2 ad 5 mm longo bracteis glabris ca. 4,5 cm longis. Tepala exteriores 4, ca. 4,5 x 1 cm, tepala interiores 8, ca. 4 ad 4,5 x 1 ad 1,5 cm. Stamina ca. 55 filamenta brevia ca. 1 mm longa antheris 8 ad 13 mm longis appendice setacea 10 ad 15 mm longa. Fructus ellipsoideus vel ovoides 5 ad 7 x 4 ad 5 cm pedicello, cicatrice perianthi et staminorum, et gynophoro omnibus ca. 5 mm longibus vel gynophoro reducto. — Typus: *Paymans 173* (L; iso K, SING), Borneo, Nunukan I.

Tree 23–40 m by 40–112 cm; twigs glabrous, terminal buds glabrous, nearly linear, c. 2 cm long; stipules 2–3.5 by c. 7 mm, glabrous at both surfaces. *Leaves* glabrous, usually narrowly elliptic, rarely elliptic, 7.5–21 by 3.5–6 cm; apex acuminate, acumen 7–10(–15) mm; margin slightly thickened, probably containing a vein; base acute to sometimes nearly rounded, decurrent into two ridges on the petiole; midrib much prominent on the under surface; nerves in 11–16 pairs, meeting in a mostly rather inconspicuous intramarginal vein, slightly prominent on both under and upper surface; reticulation very fine (about half as fine as in *M. elegans*), slightly prominent on the otherwise very smooth and somewhat glossy upper surface, inconspicuous to slightly prominent on the rather dull and mostly darker coloured under surface, rarely more prominent on both surfaces. Petiole rather slender, 12–17 mm. Brachyblast glabrous, often curved at the base, 3–5 cm long, pedicle 2–5 mm; spatheaceous bracts glabrous, c. 4.5 cm long. *Flowerbud* narrowly ovoid, c. 4.5 by 1.5 cm. *Outer tepals* 4, c. 4.5 by 1 cm inner tepals 8, c. 4–4.5 by 1.5 (the outer ones)–1 (the inner ones) cm. *Stamens* c. 55, filament c. 1 mm, anthers 8–13 mm, setaceous connective appendage 10–15 mm; gynophore in the observed flowers clearly present. *Fruits* ellipsoid or ovoid, c. 5–7 by 4–5 cm, pedicle, scars of perianth and stamens, and gynophore all c. 5 mm long or gynophore reduced.

Distribution. Malesia: Borneo (Sarawak, Sabah, E. Kalimantan); Philippines (Palawan, 1 coll.).

Ecology. Rare, 14 collections in total. In primary forest, on sandy loam (once recorded) or on ultrabasic in Palawan. Fl. Febr.–Aug., fr. Febr.–Nov. Altitude from low to 1800 m.

Vernacular names. Borneo: asam (M), jalat, uwun (Dyak).

Note. This species resembles vegetatively and in fruit very much *M. elegans* but the flowers are clearly distinct by having only 12 tepals which are also broader than in *M. elegans*. Also the reticulation is more dense. Some Bornean collections of which the flowers are not known, as well as the collection from Palawan, might belong to *M. elegans*.

10. *Magnolia pahangensis* Noot., *spec. nov.* – Fig. 3i, j.

Arbor ca. 30 cm diam. ramulis gemmis apicalibusque glabris. Folia glabra (anguste) elliptica 4,5 ad 7,5 cm longa et 1,5 ad 3,5 cm lata margine crasso apice vix atque haud acuminato venis primariis 8 ad 12 paribus prominentibus reticulatione dense prominente petiolo 7 ad 10 mm longo. Brachyblastus glaber ca. 15 mm longus pedicellum absens. Tepala exteriores 4, ca. 20 mm longa et 6 ad 7 mm lata, tepala interiores 8, 3 ad 4 mm lata. Stamina ca. 10, filamentum ca. 1 mm longo antheris ca. 3 mm longis appendice connectivi ca. 7 mm longa. Carpella ca. 6, fructus ignotus. – T y p u s : *Ke p FRI 9030* (L; iso SING), Bt. Jeriau, Pahang, ridge, alt. 3250 ft.

Tree, diam. 30 cm, glabrous in all its parts. *Leaves* (narrowly) obovate, 4.5–7.5 by 1.5–3.5 cm; base cunate, decurrent into the petiole, margin thickened, containing a vein, apex not, very shortly or hardly acuminate, acumen less than 4 mm long. Petiole 7–10 mm; midrib much prominent below, hardly so above; nerves in 8–12 pairs prominent on both surfaces, meeting in an intramarginal vein which is hardly distinct from the reticulation; reticulation dense, much prominent above, less so beneath. Brachyblast glabrous, 15 mm long; spathaceous bracts only one pair directly under the tepals, no pedicle. *Tepals* c. 20 mm long, the 4 outer ones 6–7 mm broad, the 8(!) inner ones 3–4 mm broad. *Stamens* c. 10, filament c. 1 mm, anthers c. 3 mm, the connective appendage as broad as the anthers, c. 7 mm long. Gynophore probably present, carpels c. 6. *Fruits* not known.

Distribution. In Malesia: Malay Peninsula (Pahang, Bt Jeriau), only known from the type.

3. Section *Blumiana*

Sect. *Blumiana* Blume, Fl. Java Magnol. (1829) 32. – *Blumia* Nees, Flora 8 (1825) 152.

Distribution. There are 7 species, in tropical and subtropical Southeast Asia from Central Himalaya to Indochina and through Malesia into New Guinea.

KEY TO THE SPECIES

1 a. Leaves usually densely appressedly pubescent beneath, 33 to more than 85 by 13–32 cm, obovate, the base usually cuneate and the margins straight for the lower half to two thirds of the blade. Nerves in 24 to more than 50 pairs. Petiole from only a few mm to 5 cm. Peduncle with a diam. of 10–20 mm. Stamens 20–25 mm. Fruiting carpels with a stout stylar spine of c. 2 cm long

12. *M. gigantifolia*

- b. Plant different. If base cuneate then either the margins straight for far less than the lower half of the leaf or leaves glabrous beneath. Fruiting carpels with a smaller spine or twigs very long villous 2
- 2 a. (Young twigs), peduncle and carpels densely very long (patently) villous. Leaves glabrous, at least when mature 3
- b. Young twigs glabrous, appressedly hairy, or tomentose, peduncle glabrous, appressedly hairy, or (villous) tomentose. Carpels glabrous or hairy 4

- 3 a. Twigs diameter 8–12 mm. Leaves 25–60 by 11–21 cm; nerves nearly straight for the major part of their length. Peduncle diameter at top 10–20 mm. Stamens c. 25 mm long. Carpels more than 100 **13. *M. lasia***
 b. Twigs diameter 5–7 mm. Leaves 23–40 by 6–11 cm; nerves leaving the midrib nearly perpendicular and gradually curved upwards. Peduncle diameter probably up to 10 mm. Stamens not known. Carpels probably less than 100
15. *M. sarawakensis*
- 4 a. Young twigs 6–7 mm diam., with young leaves (shortly) tomentose, glabrescent in patches, often part of the indument persistent on the leaves, especially on midrib and nerves. Peduncle 10–12 mm diameter at top, villous tomentose. Carpels 18–60, densely villous to tomentose **16. *M. villosa***
 b. Young twigs glabrous or appressedly hairy, rarely short villous (if tomentose diam. 7–12 mm or less than 5 mm and carpels glabrous) 5
- 5 a. Carpels 20–25(–80), densely villous-pubescent. Leaves elliptic to obovate (rarely broadly elliptic), thick coriaceous, glaucous beneath (or under surface obscured by the indument), glabrous or appressedly (finely) hairy beneath, with strongly recurved margins and rounded to bluntly acute apex. Nerves 10–16 pairs, reticulation rather coarse, alveoles more than 1 mm diam., often obscured below. Twigs diameter 6–10 mm, peduncle diameter at top 6–15 mm. Only on Mt Kinabalu **14. *M. persuaveolens***
 b. Plant different 6
- 6 a. Plant glabrous. Leaves thick coriaceous with strongly recurved margins, broadly elliptic, less than two times as long as broad, 11–18 by 6–14 cm, apex rounded to blunt acute. Nerves in 14–15 pairs, forked towards the apex. Twigs 8–10 mm diam., peduncles 9–15 mm diam. at apex **14. *M. persuaveolens***
 b. Leaves more than twice as long as broad and plant also otherwise different, glabrous or not 7
- 7 a. Plant glabrous. Leaves nearly ten times as long as broad. Petiole not longer than 2 cm **17. *M. mariusjacobsii***
 b. Plant usually not glabrous. If glabrous leaves far less than 10 times as long as broad **11. *M. candollii***

In section *Blumiana* there is a wide variation of characters making discrimination of species difficult or impossible. The characters that can be used for delimitation of species in *Magnolia* are amongst others shape and size of leaves, presence and kind of indument of twigs, leaves, and peduncle, number of primary veins, reticulation, length of petiole, relative length of stipular scar on petiole, size and number of perianth parts, size of stamens, number, shape, and size of carpels, indument of carpels, and, especially in subg. *Talauma*, the size of the style rest, which may become an obvious spine in fruit. All these characters are variable in section *Blumiana*. Because often a number of collections possess the same combination of character variation, at first sight many good taxa seem to be present. Upon further examination, however, in all the mentioned characters there are intermediates between several of those 'taxa' and also with *M. candollii*. Therefore I have dealt with them as varieties of the latter species.

11. *Magnolia candollii* (Blume) H. Keng

Magnolia candollii (Blume) H. Keng, Gard. Bull. Sing. 31 (1978) 129 ('*decandollii*'). – *Talauma candollii* Blume, Verh. Bat. Genootsch. 9 (1823) 147.

For further synonymy see under the varieties.

KEY TO THE VARIETIES

- 1 a. Plant entirely glabrous, except sometimes long caducous silky hairs between the bracts 2
 b. Young twigs and peduncles hairy (often glabrescent in fruit!) 3
 2 a. Leaves mostly obovate, 17–50 by 8–22 cm. Petiole 2.5–7 cm. Twigs diameter 5–12 mm. Peduncle diameter at top 5–13 mm. Stamens 12–30 mm. Carpels 10–c. 100, with an up to 15 mm long woody styler spine
 b. var. obovata
 b. Plant different. Twigs and peduncle usually thinner. Petiole 1–4.5 cm. Stamens 8–13(–15) mm. Spines on carpels, if present, shorter **a. var. candollii**
 3 a. Twigs diameter 5–12 mm. Peduncle diameter at top 8–20 mm. Carpels c. 40–200 4
 b. Twigs diameter 3–7 mm. Peduncle diameter at top 2–9 mm. Carpels c. 5–100
 a. var. candollii
 4 a. Carpels c. 200. Stamens c. 10 mm. Petiole 2–4 cm **d. var. beccarii**
 b. Carpels c. 40–150. Stamens 12–30 mm. Petiole 1.5–11 cm 5
 5 a. Leaves (at least when young) hairy beneath. Carpels c. 50–100. Stamens 13–30 mm. Petiole 2.5–11 cm **e. var. singapurensis**
 b. Leaves glabrous beneath. Carpels c. 40–150. Stamens 12–20 mm. Petiole 1.5–6.5 cm **c. var. angatensis**

a. var. candollii – Fig. 9.

Magnolia candollii (Blume) H. Keng, Gard. Bull. Sing. 31 (1978) 129 ('*decandollii*'). – *Talauma candollii* Blume, Verh. Bat. Genootsch. 9 (1823) 147; Bijdr. (1825) 9; Fl. Java Magnol. (1829) 32, t. 9, 12A; Lindl., Bot. Reg. 20 (1834) t. 1709; Hassk., Cat. Pl. Hort. Bog. (1844) 177; Hook., Bot. Mag. 72 (1846) t. 4251; Miq., Fl. Ind. Bat. 1, 2 (1858) 14; Ann. Mus. Bot. Lugd. Bat. 4 (1868) 68, excl. parte; Kurz, J. As. Soc. Beng. 43, ii (1874) 47; For. Fl. Burma 1 (1877) 24; K. & V., Bijdr. 4 (1896) 166; Backer, Fl. Bat. 1 (1907) 8; Koord., Exk. Fl. Java 2 (1912) 240, t. 48; Koord.-Schum., Syst. Verz. 1, Fam. 95 (1913) 3; Ridley, Enum. Born. (1913) 72, p.p.; Merr., En. Born. (1921) 251, p.p.; Malm, Fedde Repert. (1934) 274; Burkill, Dict. 2 (1936) 2120; Humbert in Gagnep., Suppl. Fl. Gén. Indo-Chine 1 (1938) 31; H. Keng in Whitmore, Tree Fl. Malaya 2 (1973) 293; Noot. in Whitmore & Tantra, Tree Fl. Indonesia, Sumatra Check List (1986) 143. – *Blumia candollii* (Blume) Nees, Flora 8 (1825) 152. – *Manglietia candollii* (Blume) Wall., Cat. (1832) 6497. – Lectotype: *Blume s.n.* (L, sheet nr. 908.126-1939), Salak.

Talauma candollii Blume var. *latifolia* Blume, Bijdr. (1825) 9. – Lectotype: *Blume s.n.* (L, sheet nr. 908.126-1877), Noesa Kambangan.

Magnolia rumphii Spreng., Syst. Veg. 4, 2 (1827) 217. – [*Sampacca montana* Rumph., Herb. Amb. 2 (1741) 204, t. 69]. – *Liriodendron liliiferum* Linné, Sp. Pl. ed. 2, 1. (1762) 755. – *Magnolia pumila* auct. non Andr.: DC., Syst. 1 (1817) 458, p.p.; Prod. 1 (1824) 81, p.p. –

- Talauma rumphii* Blume, Bijdr. (1825) 10; Fl. Java Magnol. (1829) 39; Miq., Fl. Ind. Bat. 1, 2 (1858) 14; Merr., Interpr. Rumph. (1917) 224. — *Talauma pumila* Blume, Fl. Java Magnol. (1829) 38, pro syn. Linné. — *Magnolia liliifera* (Linné) Baill., Hist. Pl. 1 (1868) 141, excl. parte; Druce, Bot. Exch. Club Soc. Br. Is. 3 (1914) 421. — *Talauma liliifera* (Linné) O.K., Rev. Gen. Pl. 1 (1891) 6, excl. var., non *T. liliifera* Kurz (1874). — Type: Rumphius t. 69.
- Talauma mutabilis* Blume, Fl. Jav. Magnol. (1829) 35, t. 10, 11, 12B; Hassk., Cat. Hort. Bog. (1844) 177; Moritzi, Syst. Verz. (1846) 36; Korth., Ned. Kruidk. Arch. 2, Versl. (1851) 98; Miq., Fl. Ind. Bat. 1, 2 (1858) 14; Suppl. 1 (1860) 152, (1861) 366; Hook. f. & Thoms., Fl. Br. Ind. 1 (1872) 40; F.-Vill., Novis. App. (1880) 3; Vidal, Cat. Pl. Manila (1880) 15; Naves, Novis. App. (1880–1883) t. 148; King, J. As. Soc. Beng. 58, ii (1889) 373; Ann. Bot. Gard. Calcutta 3 (1891) 203, t. 44; Craib, Fl. Siam. En. 1 (1925) 25; Baker f., J. Bot. 62, Suppl. (1924) 2, excl. parte, ibid. 44, Suppl. 1 (1926) 142. — Lectotype: *Blume s.n.* (L, sheet nr. 908.126-1903), Bantam.
- Talauma mutabilis* Blume var. *acuminata* Blume, Fl. Java Magnol. (1829) 36, t. 11, excl. sciagr. — Lectotype: *Blume s.n.* (L, sheet nr. 908.126-1885), Java.
- Talauma mutabilis* Blume var. *longifolia* Blume, Fl. Java Magnol. (1829) 37; Finet & Gagnep., Fl. Gén. Indo-Chine 1 (1907) 33. — *Talauma longifolia* (Blume) Ridley, J. Fed. Mal. St. Mus. 17 (1916) 38; Fl. Mal. Pen. 1 (1922) 16; Craib, Fl. Siam. En. 1 (1925) 25, excl. parte. — Lectotype: *Blume* (L, sheet nr. 908.126-1875), Java.
- Talauma mutabilis* Blume var. *splendens* Blume, Fl. Java Magnol. (1829) 38, t. 11 ('*sciagraphia*'). — *Magnolia splendens* Reinw. ex Blume, Fl. Jav. Magnol. (1829) 38, nom. syn., non *M. splendens* Urb. (1899). — Type: *Reinwardt* (L, sheet nr. 908.126-1918), Java.
- Talauma rabaniana* Hook. f. & Thoms., Fl. Indica 1 (1855) 75; Finet & Gagnep., Bull. Soc. Bot. Fr. Mém. 4 (1906) 32. — Type: *Hook. f. & Thomson* (K; iso BM, L), in mont. Khasia.
- Talauma rubra* Miq., Fl. Ind. Bat. 1, 2 (1858) 14; Suppl. 1 (1860) 153; Ann. Mus. Bot. Lugd. Bat. 4 (1868) 69; Noot. in Whitmore & Tantra, Tree Fl. Indonesia, Sumatra Check List (1986) 143. — Type: *Teijsmann HB 470* (U; iso BO, L), Sumatra, Lolong.
- Manglietia celebica* Miq., Ann. Mus. Bot. Lugd. Bat. 4 (1868) 72. — *Talauma miqueliana* Dandy, Kew Bull. (1927) 262. — Type: *Teijsmann & de Vriese* (L; iso BO), Celebes.
- Manglietia sebassa* King, J. As. Soc. Beng. 58, ii (1889) 370; Ann. Bot. Gard. Calcutta 3 (1891) 211, t. 54; Ridley, Fl. Mal. Pen. 1 (1922) 14. — *Talauma sebassa* Miq. [Fl. Ind. Bat., Suppl. 1 (1860) 153, nomen] ex Dandy, Kew Bull. (1928) 192; H. Keng in Whitmore, Tree Fl. Malaya 2 (1973) 294; Noot. in Whitmore & Tantra, Tree Fl. Indonesia, Sumatra Check List (1986) 143. — Type: *Teijsmann 3983* (U; iso BO, L), Sumatra, Moeara Enim.
- Talauma andamanica* King, J. As. Soc. Beng. 58, ii (1889) 372; Finet & Gagnep., Bull. Soc. Bot. Fr. Mém. 4 (1906) 32. — Type: *King's coll. 84* (K; iso BM, L), Andaman Islands.
- Talauma forbesii* King, J. As. Soc. Beng. 58, ii (1889) 373; Ann. Bot. Gard. Calcutta 3 (1891) 206, t. 45A. — [*Magnolia forbesii* King, Ann. Bot. Gard. Calcutta 3 (1891) 206, nom. syn.] — Type: *Forbes 1853* (CAL, non vidi; iso BM, GH, K), Sumatra.
- Talauma kunstleri* King, J. As. Soc. Beng. 58, ii (1889) 373; Ridley, Fl. Mal. Pen. 1 (1922) 16. — [*Magnolia kunstleri* King, Ann. Bot. Gard. Calcutta 3 (1891) 204, nom. syn.] — Type: *King's coll. 6383* (BM, K), Perak.
- Talauma inflata* P. Parm., Bull. Sc. Fr. Belg. 27 (1896) 208, 273, t. 8, f. 10. — *Talauma undulatifolia* Agostini, Atti Com. Accad. Fisiocrit. Siena IX, 7 (1926) sep. 26. — Type: *Beccari P.S. 76* (MEL; iso BM, BO, L, P), Sumatra.
- Talauma javanica* P. Parm., Bull. Sc. Fr. Belg. 27 (1896) 208, 274. — Type: *Zollinger 2809* (MEL, non vidi; iso A, BM, BO, P), Java.
- Talauma gitingensis* Elmer, Leaf. Philip. Bot. 4 (1912) 1497; Dandy, Kew Bull. (1927) 420; Lingn. Sc. J. 7, 1929 (1931) 142. — Type: *Elmer 12443* (non vidi), Sibuyan, Giting-Giting.
- Talauma oreadam* Diels, Bot. Jahrb. 54 (1916) 240; A.C. Smith, J. Arnold Arbor. 23 (1942) 441; Croft in Womersley, Handb. Fl. Papua New Guinea (1978) 129, t. 66. — *Aromadendron oreadam* (Diels) Kaneh. & Hatus., Bot. Mag. Tokyo 57 (1943) 147. — Type: *Ledermann 9114* (K), Sepik Gebiet: Etappenberg, 850 m.

- Talauma reticulata* Merr., Philip. J. Sc. 17 (1920) 249. – Type: *BS 35187* (K), Dinagat I.
- Talauma borneensis* Merr., J. Str. Br. Roy. As. Soc. 85 (1922) 173. – Type: *Ramos 1533* (BO, L), Sandakan and vicinity.
- Talauma sumatrana* Agostini, Atti Com. Accad. Fisiocrit. Siena IX, 7 (1926) sep. 28. – Type: *Beccari P.S. 918* (FI; iso L), Sumatra, Padang; sgei Bulu.
- Magnolia pachyphylla* Dandy, Kew Bull. (1928) 186. – Type: *FB.3864 Curran* (K; iso NY, US), Palawan.
- Talauma athliantha* Dandy, Kew Bull. (1928) 189. – Type: *Ridley* (K), Sumatra, Berastagi.
- Talauma gitingensis* var. *glabra* Dandy, Kew Bull. (1928) 189. – Type: *BS 39436 Ramos* (BM; iso BO, US), Mindoro.
- Talauma gitingensis* var. *rotundata* Dandy, Kew Bull. (1928) 190. – Type: *Vidal 2554* (non vidi), Palawan.
- Talauma gracilior* Dandy, Kew Bull. (1928) 190. – Type: *Robinson & Kloss 6040* (K), Kedah.
- Talauma peninsularis* Dandy, Kew Bull. (1928) 192; H. Keng in Whitmore, Tree Fl. Malaya 2 (1973) 294. – Type: *Burkill & Haniff 16053* (K; iso BO, SING), Pahang.
- Talauma soembensis* Dandy, Kew Bull. (1928) 193. – Type: *Iboet 311* (BO; iso L), Soemba, Boendohero.
- Magnolia craibiana* Dandy, Kew Bull. (1929) 105. – Type: *Kerr 15537* (BM; iso K), Siam, Nankwan Sritamarat.
- Talauma siamensis* Dandy, Kew Bull. (1929) 105. – Type: *Put 936* (BM; iso K), Siam.
- Magnolia thamnodes* Dandy, J. Bot. 68 (1930) 208. – *Manglietia thamnodes* (Dandy) Humbert in Gagnep., Suppl. Fl. Gén. Indo-Chine 1 (1938) 35. – *Talauma thamnodes* (Dandy) Tiep, Feddes Rep. 91 (1980) 507. – Type: *Poilane 282* (P, fragment in K), Cambodge, Mont de l'Elephant.
- Talauma nhatrangensis* Dandy, J. Bot. 68 (1930) 210; Humbert in Gagnep., Suppl. Fl. Gén. Indo-Chine 1 (1938) 31. – Type: *Poilane 8364* (P; iso K), Indo-China, Annam.
- Magnolia eriostepta* Dandy ex Humbert var. *poilanei* Dandy ex Humbert in Gagnep., Suppl. Fl. Gén. Indo-Chine 1 (1938) 40. – Type: *Poilane 12433* (P), Cana, prov. Phanrang.
- Magnolia pumila* auct. non Andr.: Blume, Bijdr. (1825) 9, p.p. – *Talauma pumila* auct. non Andr.: Blume, Fl. Jav. Magnol. (1829) 38, p.p.; Miq., Fl. Ind. Bat. 1, 2 (1858) 14, p.p.; Ann. Mus. Bot. Lugd. Bat. 4 (1868) 69; Ridley, J. Mal. Br. Roy. As. Soc. 1 (1923) 51.
- Talauma villariana* Rolfe, J. Linn. Soc. Bot. 21 (1884) 307, pro syn. F. Vill. excl. typus; Merr., Bur. Gov. Lab. Publ. 35 (1906) 7; Philip. J. Sc. 1 (1906) Suppl. 52; *ibid.* 5 (1910) C 348; Sp. Blanc. (1918) 12 ('villarii'); En. Philip. 2 (1923) 152, p.p.
- Talauma elegans* auct. non Miq.: Baker f., J. Bot. 62 Suppl. (1924) 2.
- Champaca turbinata* Noronha, Verh. Bat. Genootsch. 5, 4 (1791) 12, nomen.
- Magnolia fragrans* Reinw. ex Blume, Cat. Gewassen Lands Plantentuin Buitenz. (1823) 79, nomen.
- Magnolia odoratissima* Reinw. ex Blume, op. cit., nomen.
- Talauma mutabilis* var. *acuminatissima* Teijsm. & Binn., Cat. Hort. Bogor. (1866) 177, nomen.
- Talauma mutabilis* var. *brevifolia* Teijsm. & Binn., op. cit., nomen.
- Talauma mutabilis* var. *latifolia* Teijsm. & Binn., op. cit., nomen.
- Talauma mutabilis* var. *leiocarpa* Teijsm. & Binn., op. cit., nomen.
- Talauma macrophylla* Blume ex Miq., Ann. Mus. Bot. Lugd. Bat. 4 (1868) 68, nom. syn.

Mostly a shrub or small tree, rarely a medium-sized tree to 25 m high and 50 cm diam.; twigs appressedly long pilose (rarely woolly or villous when young), glabrescent, diameter 3–5(–7) mm. Sometimes entire plant glabrous. Stipules adnate to petiole for up to halfway to up to their whole length. *Leaves* glabrous or (finely) appressedly hairy beneath, hairs straight or sometimes circular-curved at base, in some specimens both types of hairs occur, elliptic to narrowly elliptic, sometimes somewhat ovate or obovate, (6–)13–35(–46) by (3–)3.5–15(–20) cm; base cuneate to attenuate, rarely rounded but somewhat attenuate; apex acuminate, often obliquely



Fig. 9. *Magnolia candollii* (Blume) H. Keng var. *candollii*. — a. Habit; b. fruit (van Steenis 9417); c. carpel (Kostermans 7337), all $\times 0.62$; d. ovaries, $\times 0.92$; e. anther, $\times 2.75$ (both *Herb. Bog.* 124717).

folded when dry, acumen 10–25(–35, 'var. *acuminata*') mm, rarely rounded to obtuse; margins nearly meeting at their base at the upper side of the midrib; lateral nerves in (7–)10–20 pairs forming an angle of 30–75 degrees with the midrib, meeting in a looped intramarginal vein, prominent on both surfaces; reticulation prominent on both surfaces, from rather coarse to very fine. In some collections at both sides of the midrib a furrow-like line of depression caused by the leaves being folded in bud. Petiole often conspicuously thickened towards its base, with same indument as twigs, 10–45 mm, stipular scars (up to halfway to) up to the top. Peduncle densely long brown pubescent, rarely glabrous, with 1 to 10 nodes, 0.7–8 cm long, at the top 2–6(–9) mm thick, the uppermost leaf sometimes reduced. Rarely peduncle from the axil of a leaf, up to 8 cm long, with up to 10 nodes from reduced leaves; spatheaceous bracts long brown pubescent without, rarely one of them fertile and the inflorescence bearing two flowers; pedicle 0–5 mm, with same indument. *Outer tepals* 3, sometimes pubescent towards the base c. 1.5–5(–6.5) cm long by 1–2 cm broad; *inner tepals* 6–9, in two to three whorls, shorter than to as long as outer tepals. *Stamens* 8–13(–15, rarely in Thailand to more than 20) mm long, incl. the 1.5–2 mm long triangular connective appendage; *carpels* 5–more than 100, glabrous, rarely hairy and soon glabrescent. *Fruits* about elliptic, 4–7.5(–15) by 2.5–6 cm, the carpels terminating in a protruding, outwards curved to 5 mm long stylar beak which often is deciduous. *Seeds* 1–2 from each carpel, 6–20 mm long. When the beaks of the carpels deciduous, the fruits are quite smooth when ripe (especially in the Moluccas and New Guinea).

Distribution. Sikkim, Assam (Khasi Hills), Thailand, Cambodia, the Andaman Islands, and Hainan. Throughout Malesia.

Ecology. In all kinds of forest, on different types of soil (ultrabasic, sandy, limestone, clay, in kerangas, on volcanic tuff, sometimes on waterlogged soil). Altitude 0–1700 m, in Sumatra up to 2500 m, in Borneo (Kinabalu) and in Celebes to 2000 m, in New Guinea up to 2700 m. Fl., fr. Jan.–Dec.

Uses. Rarely recorded (Lesser Sunda Islands and Celebes) as very hard, durable construction wood.

Vernacular names. Sumatra: djato (Karo), medang abu (Kerinci), si tek-wok (Pahang); Java: tjempaka gonda, t. gondoh, t. gondok (S. Java), t. gunung, t. putih, kembang tundjung, ketundjung; Flores: longkor; Borneo: tjempaka telur (Pontianak), talah-uma (Iban); Philippines: anobling (Luzon); Celebes: danoan, wasian batu, w. watu (Minahasa); New Guinea: adjai dia, diwarmom (Kebar Valley).

Collector's notes. Flowers sweet scented, white to cream, often red tinged or violet at base, sometimes light red or purplish. Outer tepals often greenish.

Notes. *Magnolia pachyphylla* Dandy is reduced here although it shows some differences, e.g., the thicker leaves. In my opinion it is an adapted form of ultrabasic. In some specimens there is a tendency of the inflorescence to become axillary like in the genera *Michelia* and *Elmerrillia*. In some specimens which resemble var. *obovata*, the stamens become over 20 mm long. *Talauma reticulata* has the leaves of var. *angatensis* and the fruits of var. *candollii*. *Magnolia craibiana*, *M. thamnoides*, *Talauma siamensis* and *T. nhatrangensis*, all of Dandy, represent various aspects of this variety.

b. var. obovata (Korth.) Noot., stat. nov.

- Talauma obovata* Korth., Ned. Kruidk. Arch. 2, Versl. (1851) 98, non *Magnolia obovata* Thunb.; Miq., Fl. Ind. Bat. 1, 2 (1858) 14; Ann. Mus. Bot. Lugd. Bat. 4 (1868) 69; Ridley, Contr. Fl. Borneo (1913) 72, excl. spec. Bangka; Merr., En. Born. (1921) 251, excl. parte. — Lectotype: *Korthals s.n.* (L, sheet nr. 925.250-739; iso BO; syntype L), G. Pamatton.
- Talauma hodgsoni* Hook.f. & Thomson, Fl. Indica (1855) 74; Finet & Gagnep., Bull. Soc. Bot. Fr. 52, Mém. 4 (1906) 32; Humbert in Gagnep., Suppl. Fl. Gén. Indo-Chine 1 (1938) 31. — Type: *Hooker* (K; iso L), Sikkim, 2000–5000 ft.
- Talauma oblanceolata* Ridley, Fl. Mal. Pen. 5 (1925) 286, excl. pl. e Borneo et Bangka; Dandy, Kew Bull. (1928) 192; H. Keng in Whitmore, Tree Fl. Malaya 2 (1973) 294. — Type: *Ridley 15590* (SING, K), Pahang.
- Talauma betongensis* Craib, Kew Bull. (1925) 7; [Fl. Siam. En. 1 (1924) 24, nomen]; Dandy, Kew Bull. (1928) 189. — *Magnolia betongensis* (Craib) H. Keng, Gard. Bull. Sing. 31 (1978) 129. — Type: *Kerr 7449* (K; iso BM), Pattani.
- Talauma sclerophylla* Dandy, J. Bot. 66 (1928) 47. — Type: *Haviland 3148* (BM; iso K), Sarawak.
- Talauma levissima* Dandy, Kew Bull. (1928) 191. — Type: *Ridley 9047* (K, SING), N. Borneo.
- Manglietia glauca* auct. non Blume: Ridley, Fl. Mal. Pen. 1 (1922) 14, pro coll. Bell. & Haniff.
- Talauma candollei* auct. non Blume: Ridley, Contr. Fl. Born. (1913) 72, p.p.; Merr., En. Born. (1921) 251, p.p.

Treelet, rarely a medium-sized tree 3–20 m, diameter up to 25 cm (50 cm once recorded); twigs glabrous, diameter 5–12 mm. *Leaves* glabrous, (broadly to narrowly) obovate or sometimes elliptic, 17–50 by 8–22 cm; apex rounded to slightly acuminate; base mostly cuneate, often attenuate; nerves in 9–25 pairs, curved upwards and meeting in an intramarginal vein; reticulation rather coarse, sometimes obscure (*T. levissima* Dandy). Petiole 2.5–7 cm, scar of stipules from up to about halfway to (nearly) the apex. Peduncle glabrous, 3–12 cm, diameter at top 5–13 mm, with 2–18 nodes, pedicle absent or very short; between the (upper) bracts often tufts of (very) long, woolly, soon caducous hairs. *Tepals* 3–10 cm, the 3 outer ones sometimes recurved in mature flowers (but evidently many flowers were not yet mature when collected); the 6 inner ones erect, in big flowers quite narrow, in small flowers often broader and fleshy. *Stamens* from c. 1.2 to c. 3 cm, the appendage (narrowly) triangular to subulate, c. 3 mm long, filament c. 3 mm; carpels c. 10–100, the styles long, becoming woody spines up to 15 mm in fruit but sometimes caducous. *Fruits* 5–15 by 4–7.5 cm, about ellipsoid.

Distribution. Sikkim, Nepal, Assam (Khasia), Burma, and Thailand. In Malesia: Malay Peninsula (c. 20 coll.); Borneo, Sarawak (3rd and 4th Div., 7 coll.), Sabah (many), E. Kalimantan (13 coll.).

Ecology. Primary and secondary forest, 0–1700 m alt.. Fl., fr. Jan–Dec.

Vernacular name. Borneo: tala umah (Iban).

Collector's notes. Peduncles blue green, often recorded as glaucous. Tepals cream, often recorded with purple base, sometimes (yolk) yellow with white base. Outer tepals sometimes recorded as green. Bracts purple.

Note. In the absence of fruits hardly to distinguish from *Magnolia henryi* Dunn, also described as *Talauma kerrii* Craib. *Talauma sclerophylla* Dandy is provisionally placed here; it has the stamens and leaves as var. *obovata* but minute hairs on the peduncle.

c. var. *angatensis* (Blanco) Noot., *stat. nov.*

Magnolia angatensis Blanco, Fl. Filip. (1837) 859, ed. 3, 2 (1878) 243. – *Talauma angatensis* (Blanco) Vidal, Cat. Pl. Prov. Manila (Nov. 1880) 17; F.-Vill., Nov. App. (Dec. 1880) 3; Vidal, Sin. Philip. Atl. (1883) t. 3; Rev. Pl. Vasc. Philip. (1886) 38; Ceron, Cat. Pl. Herb. (1892) 9; Merr., Bur. Gov. Lab. Publ. 35 (1906) 7; Sp. Blanc. (1918) 146; En. Philip. 2 (1923) 151. – Type: *Blanco* (non vidi).

Talauma villariana Rolfe, J. Linn. Soc. Bot. 21 (1884) 307, excl. syn.; Vidal, Rev. Pl. Vasc. Philip. (1886) 38; Ceron, Cat. Pl. Herb. (1892) 9; Merr., En. Philip. 2 (1923) 152, excl. maj. parte. – *Talauma mutabilis* auct. non Blume: F.-Vill., Nov. App. (1880) 3, excl. parte et tab. 148. – Type: *Vidal 5* (K, L), Bulacan. *Vidal 5* in A is different and belongs to var. *candollii*.

Talauma luzoniensis Warb. ex Perkins, Fragm. Fl. Philip. (1904) 171; Merr., Bur. Gov. Lab. Publ. 35 (1906) 8; Philip. J. Sc. 3 (1909) C 406. – Type: *Warburg 11767* (B, non vidi; photo in BM), N. Luzon, Cagayan, Malagueg.

Talauma grandiflora Merr., Bur. Gov. Lab. Publ. 29 (1905) 13; op. cit. 35 (1906) 7. – Type: *FB 314* (non vidi).

Talauma oblongata Merr., Bur. Gov. Lab. Publ. 35 (1906) 8. – Type: *Merrill 1003* (K), Luzon.
Talauma gigantifolia auct. non Miq.: F.-Vill., Nov. App. (1880) 4.

Tree to 18 m by 45 cm diam.; twigs appressedly pubescent to glabrous, diameter 5–12 mm. *Leaves* glabrous, (narrowly to broadly) elliptic, 22–45 by 8–22 cm; acumen between 0 and 20 mm; base cuneate, attenuate; midrib much prominent at both sides; nerves in 12 to 26 pairs, with an angle of 50 to 70 degrees to midrib. Petiole with same indument as twigs, 1.5–6.5 cm, often much thickened at base, scars of stipules from up to halfway, and then the leaf margins decurrent into two ridges, to up to the top. Peduncle (sparsely) appressedly pubescent, often glabrescent under fruit, at the top 8–15 mm diam., 2–5 cm long, nodes 2–11; bracts glabrous but appressedly puberulous at base, to 8 cm, but often much shorter. *Outer tepals* 3, to 7 cm; inner tepals 6, 2.5–4.5 cm long. *Stamens* introrse, 12–20 mm long, including the 1–3 mm long filament and the short triangular appendage; carpels pubescent, sometimes only at base of ovary, to glabrous, c. 40 to more than 150. *Fruit* 6–15 by 5–7 cm, base of torus under fruit 10 to 17 mm diam., the carpels provided with persistent styler spines to c 7 mm long.

Distribution. In Malesia: Philippines: Luzon (c. 20 coll.), Mindanao (8 coll.), Busuanga I. (1 coll.), Camiguin I. (1 coll.), Dalupiri I. (1 coll.), Negros (3 coll.), Palawan (6 coll.), Panay, Capiz Prov. (1 coll.), Samar (2 coll.), Sulu Archipelago, Tawi Tawi I. (1 coll.); Moluccas, Talaud (1 coll.).

Ecology. Primary forest. Altitude 0–200 m, but rarely recorded.

Uses. Used for construction and canoe building.

Collector's note. Flowers white.

d. var. *beccarii* (Ridley) Noot., *comb. nov.*

Talauma beccarii Ridley, Kew Bull (1912) 381; Contr. Fl. Born. (1913) 72; Merr., Enum. Born. (1921) 251. – Type: *Beccari 3959* (K; iso FI), Sarawak, colline del Sadong.

Tree (7–)15–30 m by 20–50 cm; twigs and buds glabrous or appressedly pubescent, diameter of twigs under peduncle 5–9 mm. *Leaves* glabrous, coriaceous with

recurved margins, elliptic to obovate, 16–36 by 6–17 cm; apex slightly acuminate, base cuneate in the lower part; nerves in 16–26 pairs, slightly curved upwards but nearly straight, meeting in an intramarginal vein close to the margin. Petiole 20–40 (–60) mm, stipular scar (nearly) to the apex, rarely up to one third. Peduncle densely appressedly pubescent, 3–8 cm long, nodes 6–13, diameter at top 9–18 mm; bracts pubescent. *Tepals* 4.5–9 cm long. *Stamens* c. 10 mm; carpels many (c. 200), sparsely pubescent to glabrous in flower, glabrescent. *Fruit* with small styler spines on the mature carpels, c. 12 by 6 cm.

Distribution. In Malesia: Borneo: Sarawak, 1st Div. (1 coll.), 3rd Div., Kapit Distr. (2 coll.), 4th Div., Marudi (1 coll.); Sabah, Lahad Datu (4 coll.); E. Kalimantan, Berouw (2 coll.), Sangkuliran I. (2 coll.); W. Kalimantan, Amai Ambit (1 coll.).

Ecology. Forest. Altitude to 800 m.

Vernacular name. Borneo: talauma (Iban).

Collector's note. Flowers yellow or cream coloured.

e. var. *singaporensis* (Ridley) Noot., *stat. nov.*

Talauma singaporensis Ridley, Kew Bull. (1914) 323; Fl. Mal. Pen. 1 (1922) 16; Dandy, Kew Bull. (1928) 192; H. Keng in Whitmore, Tree Fl. Malaya 2 (1973) 293; Noot. in Whitmore & Tantra, Tree Fl. Indonesia, Sumatra Check List (1986) 143. — *Magnolia singaporensis* (Ridley) H. Keng, Gard. Bull. Sing. 31 (1978) 129. — Lectotype: *Ridley 5091* (SING; iso BM), Singapore, Chan Chukang.

Talauma kuteinensis Agostini, Atti Com. Accad. Fisiocrit. Siena IX, 7 (1926) sep. 30. — Type: *Beccari P.B. 2102* (FI), Borneo.

Talauma lanigera auct. non Hook. f. & Thoms.: Ridley, J. Str. Br. Roy. As. Soc. 33 (1900) 38.

Talauma obovata auct. non Korth.: Ridley, Contr. Fl. Born. (1913) 72, pro spec. Bangka; Merr., En. Born. (1921) 251, pro coll. Low.

Talauma oblanceolata Ridley, Fl. Mal. Pen. 5 (1925) 286, quoad pl. Borneo et Banca.

Tree 6–40 m, diam. 20–60 cm; twigs appressedly long pubescent to shortly tomentose, glabrescent, 7–12 mm diam. *Leaves* with basally curled hairs beneath, glabrescent (in fruiting specimens often already glabrous), (narrowly) elliptic to obovate, 30–70 by 8–25 cm; apex slightly acuminate; base cuneate; nerves in 17–29 pairs, prominent at both surfaces; reticulation idem, rather coarse. Petiole with same indument as twigs, 2.5–11 cm long, stipular scar from up to one third to up to two thirds of its length. Peduncle densely appressedly long pubescent, 5–12 cm, diameter at top 10–20 mm, nodes 5–11; bracts with same indument. *Outer tepals* glabrous, 5–8 cm long, the inner ones c. 2 cm shorter; stamens (13–)25–30 mm; carpels glabrous or nearly so, 50–150. In fruit the styler spine present, recurved, but top often incurved, (5–)12–17 mm long. *Fruits* 10–15 by 6–7 cm.

Distribution. In Malesia: Sumatra, Simalur I. (2 coll.), Bangka (2 coll.); Malay Peninsula, Singapore (5 coll.); Borneo, Sarawak, Kuching, Semengoh arb. (5 coll.), 3rd Div. Kapit Distr. (2 coll.), Kutein (1 coll.), Sabah, Sandakan, sgei Labuk (1 coll.), Sipiting, Ulu Mendalong (1 coll.), E. Kalimantan (3 coll.).

Ecology. Primary rainforest. Altitude 0–600 m.

12. *Magnolia gigantifolia* (Miq.) Noot., *comb. nov.*

Talauma gigantifolia Miq., Fl. Ind. Bat. 1, 2 (1858) 15; Suppl. 1 (1860) 153; (1861) 366; Teijsm. & Binn., Cat. Hort. Bog. (1866) 177; Miq., Ann. Mus. Bot. Lugd. Bat. 4 (1868) 70; Boerl., Cat. Hort. Bog. (1899) 7; Ridley, Contr. Fl. Born. (1913) 72; Merr., En. Born. (1921) 251; Pl. Elm. Born. (1929) 60; Noot. in Whitmore & Tantra, Tree Fl. Indonesia, Sumatra Check List (1986) 143. – Type: *Teijsmann HB 463* (U; iso BO, L), Sumatra West Coast, Sungei Pagoe.
Talauma megalophylla Merr., J. Str. Br. Roy. As. Soc. 85 (1922) 172. – Type: *Ramos 1509* (A; iso K), Sandakan and vicinity.
Talauma magna Agostini, Atti Com. Accad. Fisiocrit. Siena IX, 7 (1926) sep. 31. – Type: *Beccari P.S. 498* (FI; iso BM, K, L), ad Ayer mantior. Provincia di Padang in Sumatra occid. [*Talauma elmeri* Merr. ex Soderberg, Svensk Bot. Tidskr. 30 (1936) 538, nomen.]

Tree 6–25 m high by 7–40 cm diam.; twigs often thick, more than 10 mm diam., densely appressedly, sometimes very long, pubescent, glabrescent. *Leaves* often crowded towards the end of the twigs, densely appressedly pubescent, glabrescent, rarely glabrous, beneath, in innovations often also above, mostly narrowly obovate, 33–85 by 13–32 cm; acumen rounded to shortly abruptly acuminate, acumen to 2.5 cm; base cuneate, usually for the lower half to two-thirds of the blade; nerves in 24–more than 50 pairs, curved upwards towards the margin and meeting in an intramarginal vein; reticulation prominent on both surfaces. Petiole with same indument as twigs, from only a few mm to 5 cm, the flat stipular scar nearly up to the top. Peduncle 2.5–15 cm, diameter 10–20 mm, nodes 5–11, densely appressedly (sometimes very long) pubescent; bracts densely appressedly pubescent. *Outer tepals* 3, at least towards the base densely appressedly pubescent, 7–9 cm long, inner tepals 6, glabrous, 6–7 cm long. *Stamens* c. 20–25 mm, the triangular connective appendage 2–3 mm; carpels from c. 40 to c. 200, densely appressedly pubescent, the stigma glabrous, styles long, persistent in fruit as c. 2 cm long stout spines. *Fruit* 13–18 by c. 8 cm.

Distribution. In Malesia: Sumatra: Padang (1 coll.), Palembang (7 coll.), Lampong (1 coll.), Bangka (4 coll.); Borneo: Sarawak (3 coll.), Sabah, Sandakan (7 coll.), Tawao (2 coll.), E. Kalimantan, Blu-u (1 coll.), Nunukan (1 coll.) and Berouw (1 coll.).

Ecology. Primary forest, on sandy (loam) soil. Altitude below 300 m.

Vernacular names. Sumatra: kayu klappoh, k. tangiheh.

Note. The flowers are reported to be from pale white via light red to dark brown, the fruits pale yellowish.

13. *Magnolia lasia* Noot., *spec. nov.*

Arbor 9 ad 25 m alta ramulis dense longe villosis 8 ad 12 mm diametro. Folia glabra elliptica ad obovata 25 ad 60 cm longa et 11 ad 21 cm lata nervis primariis 16 ad 22 paribus. Pedunculus indumento ramulis simile diametro ad apicem 10 ad 20 mm. Tepala glabra 6 ad 10 cm longa, ad 6 cm lata. Stamina 25 ad 30 mm longa. Carpellis maturis spino ca. 3 cm longo productis. – **T y p u s:** *M. Kato, M. Okamoto, K. Ueda & E.B. Walujo B-7830* (L; iso KYO), Borneo, Kalimantan Timur, Gunung Malim.

Tree 9–25 m by c. 20 cm; twigs densely very long villous when young, the indument falling in patches, diameter 8–12 mm. *Leaves* glabrous, glaucous beneath, el-

liptic to obovate, 25–60 by 11–21 cm; apex hardly acuminate; base cuneate; nerves in 16–22 pairs, prominent at both surfaces, reticulation idem, rather fine. Petiole glabrous or slightly long villous, 4–10 cm long, stipular scar from halfway up to up to the apex. Peduncle densely very long villous, 3–more than 20 cm long, diameter at top 10–20 mm; bracts not seen. *Tepals* glabrous, 6–10 cm long; stamens 25–30 mm long; carpels more than 100, densely long villous with very long styles. In fruit the carpels oblong, with a slender styler spine of c. 3 cm. Probably in ripe fruits (not seen, but certainly longer than 10 cm) still vestiges of the indument.

Distribution. In Malesia: Borneo, Sarawak, 5th Div., Lawas (2 coll.); Sabah, Tenom (2 coll.) and Mostyn (1 coll.); E. Kalimantan, near Long Bawan (4 coll.).

Ecology. Primary, secondary, and riparian forest, also kerangas. Altitude 950–1100 m. Fl. July (twice recorded), fr. March, Aug.

Vernacular name. Borneo: talal umar (Iban).

Collector's notes. Outer tepals green, inner tepals white. Outer bracts brown hairy outside. Stamens white. Carpels pale green, brown hairy.

14. *Magnolia persuaveolens* Dandy

Magnolia persuaveolens Dandy, Kew Bull. (1928) 186. – *Talauma persuaveolens* (Dandy) Dandy, Taxon 21 (1972) 468. – *Michelia ?spec.* Stapf, Trans. Linn. Soc. Lond. ser. 2, Bot. 4 (1894) 128. – **Type:** Low (K), Kinabalu.

KEY TO THE INFRASPECIFIC TAXA

- 1 a. Leaves elliptic to broadly elliptic, at least twice as long as broad. Twigs appressedly pubescent a. subsp. **persuaveolens**
- b. Leaves broadly elliptic, less than twice as long as broad. (b. subsp. **rigida**). 2
- 2 a. Plant glabrous **b**¹. var. **rigida**
- b. Twigs, leaves beneath, and carpels densely pubescent **b**². var. **pubescens**

a. subsp. **persuaveolens**

Shrub 1.5–2.5 m. (once recorded); twigs appressedly pubescent at least towards the apex, diameter 6–10 mm, terminal buds appressedly hairy. *Leaves* brown when dry, coriaceous, very finely (short) appressedly hairy at least when young, glaucous beneath, about elliptic to somewhat obovate, 9–22 by 4–8 cm; apex rounded to bluntly acute, margin rather strongly recurved, base cuneate; nerves in 10–14 pairs, slightly curved upwards and meeting in a looped intramarginal vein; reticulation prominent at both sides but often more or less obscured below, rather coarse, diameter of the alveoles much more than 1 mm. Petiole when young with same indument as twigs, glabrescent, 1.5–3 cm long, stipular scar up to \pm three quarters of its length. Peduncle appressedly pubescent, 4.5–10 cm, with 5–8 nodes, diameter at apex 6–7 mm. *Tepals* 22–45 mm, the outer three somewhat longer than the inner 6. *Stamens* 8–12 mm; carpels c. 20–25, pubescent, with rather long styles. *Fruit* glabrous, c. 5 by 3 cm, the styler spines persistent.

Distribution. In Malesia: Borneo: Sabah, Kinabalu (5 coll.).

Ecology. Mossy forest and open places. Altitude 1200–1650 m. Fl. Febr.–Aug.

Collector's note. Flowers cream.

b. subsp. rigida Noot., *subsp. nov.*

Frutex vel arbor glabra (sed varietas pubescens non glabra est). Folia coriacea late elliptica 11 ad 18 cm longa, 6–14 cm lata, venis primariis ca. 10 (var. *pubescens*) vel 15 ad 16 paribus apice rotundato vel obtuso. Tepala 5 ad 6 cm longa, stamina 18 ad 20 mm longa, carpella 20 ad 80, glabra sed in varietate pubescente pilosa, stylis longis. – **Typus:** Chew, Corner, Stainton RSNB 845 (L; iso SING), Borneo, Kinabalu, Eastern Shoulder.

b¹. var. rigida

Shrub to big tree, 3 to 25 m, diameter to 60 cm but usually much less. Twigs glabrous, thick, blackish, diameter 8–10 mm. *Leaves* glabrous, thick coriaceous with strongly recurved margins, the undersurface glaucous, broadly elliptic, always less than twice as long as broad, 11–18 by 6–14 cm; apex rounded to blunt cuneate; base attenuate; nerves in 15–16 pairs, straight, forked towards the end and meeting in a less conspicuous intramarginal vein. Petiole 23–35 mm, stipular scar from up to halfway to up to three quarter. Peduncle glabrous, thick, diameter 9–15 mm, with 2–12 nodes; bracts glabrous, c. 6 cm long. *Tepals* 5–6 cm when flower fully open, outer 3, inner 6. *Stamens* 18–20 mm, about as long as the ovary; carpels c. 20–80, with long styles. *Fruit* 6–9 by c. 5 cm, reported to become c. 12.5 cm long. Spines probably persistent, but in the herbarium often caducous.

Distribution. In Malesia: Borneo: Sabah, Kinabalu (12 coll.), recorded as a common tree.

Ecology. Frequent in gullies as a big tree without buttresses, as shrub probably on ridges. Altitude 2700–3400 m. Fl., fr. Jan., July, Nov.

Collector's notes. Petals recorded to be white or creamy, slightly purplish at base.

b². var. pubescens Noot., *var. nov.*

Varietatis rigidae multum similis sed nervis primariis ca. 10 paribus, ramulis, foliis, carpellisque pubescentibus. – **Typus:** John H. Beaman 9131 (L; iso MSC, UKMS), Borneo, Kinabalu, near Mesilau cave.

As var. *rigida*, but twigs, leaves, and carpels densely appressedly pubescent. Nerves in c. 10 pairs. Flowers not known.

Distribution. In Malesia: Borneo: Sabah, Kinabalu, only the type.

Ecology. Altitude 1950–2000 m.

Note. This variety occurs at an altitude in between the varieties *persuaveolens* and *rigida*. Although it mostly resembles var. *rigida* it differs from that variety in the indument and the number of veins.

15. *Magnolia sarawakensis* (Agostini) Noot., *comb. nov.*

Talauma sarawakensis Agostini, Atti Com. Accad. Fisiocrit. Siena IX, 7 (1926) sep. 29. — *Talauma intonsa* Dandy, Kew Bull. (1928) 191. — Type: *Beccari P.B. 3331* (FI; iso K). The isotype in K is the holotype of *Talauma intonsa* Dandy.

Twigs densely long villous, glabrescent in patches, 5–7 mm diam. *Leaves* in innovations with same indument, soon glabrous, glaucous beneath, narrowly elliptic to obovate, 23–40 by 6–11 cm; apex acuminate; base attenuate-cuneate; nerves in 12–18 pairs, leaving the midrib nearly perpendicular and then gradually curved upwards; reticulation rather coarse, prominent at both surfaces. Petiole 15–60 mm, with a stipular scar from up to about halfway to two thirds of its length. Peduncle long villous, diameter 12 mm at the top. *Flowers* probably as in *M. lasia*, but length of stamens not known; carpels densely long villous, not many (acc. to Dandy). *Fruits* not known.

Distribution. In Malesia: Borneo: Sarawak, Batang Lupar (1 coll.), SE. Kinabalu, Bt Kulung (1 coll.), W. Kalimantan, Singkadjian (1 coll.), E. Kalimantan, Lilit Buan (Teputse, 1 coll.).

Ecology. Dipterocarp forest on ultramafic soil, altitude 750 m (once recorded, Bt Kulung).

Note. This species is closely related to *M. lasia*, differing in the twigs being thinner and the leaves smaller and especially narrower while the petiole is mostly shorter.

16. *Magnolia villosa* (Miq.) H. Keng

Magnolia villosa (Miq.) H. Keng, Gard. Bull. Sing. 31 (1978) 129. — *Talauma villosa* Miq., [Fl. Ind. Bat., Suppl. 1 (1860) 153, nomen] Fl. Ind. Bat., Suppl. 1 (1861) 366; Finet & Gagnep., Bull. Soc. Bot. Fr. Mém. 4 (1906) 31; H.Keng in Whitmore, Tree Fl. Malaya 2 (1973) 293; Noot. in Whitmore & Tantra, Tree Fl. Indonesia, Sumatra Check List (1986) 144. — *Talauma rabiana* Craib var. *villosa* (Miq.) P. Parm., Bull. Sc. Fr. Belg. 27 (1896) 271. — Type: *Teijsmann HB 3690* (L; iso BO), Sumatra, Moeara Enim.

Talauma lanigera Hook. f. & Thoms., Fl. Br. Ind. 1 (1872) 40; King, J. As. Soc. Beng. 58, ii (1889) 372; Ann. Bot. Gard. Calcutta 3 (1891) 202, t. 42; Ridley, Fl. Mal. Pen. 1 (1922) 15. — Type: *Griffith 65* (K), Perak.

Tree 9–18 m by 30 cm (once recorded); twigs (shortly) tomentose, glabrescent in patches, 6–7 mm diam. *Leaves* when young at both surfaces tomentose, glabrescent but often the tomentum persistent on midrib and nerves, elliptic, 19–40(–50) by 7.5–20 cm; apex (abruptly) acuminate; base cuneate-attenuate; nerves in 13–20 (–25) pairs; reticulation rather fine, prominent on both surfaces. Petiole with same indument as twigs, 1.5–4.5(–6) cm, stipular scar from 1/4 up to 3/4 of its length. Peduncle densely (villous) tomentose, 2.5–?6 cm, diameter at top 10–12 mm; bracts densely villous tomentose. *Tepals* villous without or only at the base, 4–5 cm long. *Stamens* probably c. 15 mm; carpels 18–60, densely villous-tomentose, when ripe with a rather stout styler spine of up to 1 cm. *Fruit* 10 by 6 cm (once seen).

Distribution. In Malesia: Sumatra, Taram, E. of Pajakumbuh (1 coll.); Malay Peninsula, Penang (4 coll.), Perak (3 coll.), Genting Highlands (1 coll.),

Malacca (1 coll.); Lingga Archipelago (1 coll.); Borneo, Sabah, Lamag Dist. (1 coll.).

Ecology. Primary forest (once recorded). Altitude 450–1000 m.

Note. SAN 83393, Sabah, Lamag Distr. has twigs of 10 mm diam.; bracts to 9 cm long, tomentellous; nerves c. 25 pairs, outer tepals 6.5 cm long, hairy, inner tepals c. 5 cm long, stamens c. 2 cm long. This may be a separate variety or a hybrid with *M. candollii* var. *singaporensis*.

17. *Magnolia mariusjacobsia* Noot., spec. nov. – Fig. 10.

Arbor parva ca. 6 m alta glabra foliis anguste ellipticis vel obovatis 27 ad 55 cm longis et 3 ad 7 cm latis base anguste decurrentibus nervis primariis 20 ad 30 paribus in venam intramarginalem convenientibus petiolo cicatricato apice paene rotundato. Pedunculus cicatricibus 2 ad 3 instructus 1,5 ad 2,5 cm longus. Tepala exteriores 3, ca. 5 cm longa, tepala interiores in verticilla dua, carnossa. Stamina 3 mm (base saepe 4 mm) lata 10 ad 12 mm longa. Carpella ca. 25 stylis longis. – **Typus:** *Jacobs 5253* (L; iso B, CANB, G, K, S, US), Borneo, Sarawak, 3rd Div., Kapit Dist.

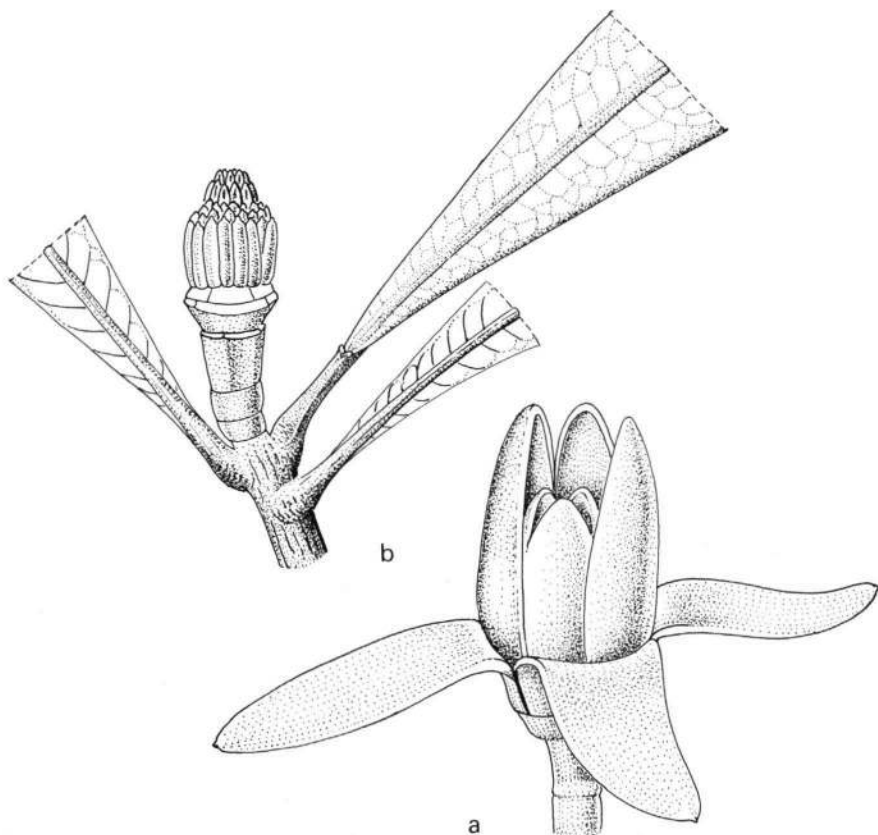


Fig. 10. *Magnolia mariusjacobsia* Noot. – a. Flower; b. deflorated flower, both $\times 0.85$ (*Jacobs 5253*).

Treelet c. 6 m high by c. 6 cm, entirely glabrous. Twigs with many obvious scars of fallen leaves. *Leaves* narrowly elliptic to obovate, 27–55 by 3–7 cm, the blade long decurrent into the short thickened, 1–2 cm long petiole which bears a stipular scar for its entire length; apex not acuminate, nearly rounded; nerves in c. 20–30 pairs, much prominent below and meeting in a prominent intramarginal vein; reticulation rather coarse, prominent beneath. Peduncle 1.5–2.5 cm, thickened towards the apex and there c. 8 mm broad, with 2–3 scars; pedicle short to absent. *Outer tepals* 3, c. 5 by 3 cm, thin; inner tepals in two whorls of three each (or the inner whorl with 4–5 tepals), fleshy, the outer whorl c. 4.5, the inner 2.5–3 cm long. *Stamens* up to 3 (at base 4) mm broad, 10–12 mm long including the broadly triangular connective appendage; carpels c. 25 with long styles protruding above the stamens. Young *fruits* only, like those of *M. candollii* var. *candollii*.

Distribution. Only the type.

Ecology. Primary forest on sandstone, on low hills.

Collector's notes. Outer perianth leaves green, inner ones cream.

EXCLUDED

(from section *Magnolia*)

Magnolia xerophila P. Parm., Bull. Sc. Fr. Belg. 27 (1896) 203, 263, t. 9, figs 21–23 (Java) = *Mimusops elengi* Linné (Sapotaceae).

EXCLUDED

(from section *Blumiana*)

Talauma fistulosa Finet & Gagnep., Bull. Soc. Bot. Fr. Mém. 4 (1906) 31, t. IV [syntypes: *Balansa* 3883, 3885, *Bon* 3176 (P)] = *Magnolia spec.* (sect. *Maingola*).

Talauma phellocarpa King, Ann. Bot. Gard. Calcutta 3 (1891) 205, t. 47bis and ter. [type: *Peal s.n.* (K), Sibsagar] = *Michelia baillonii* Pierre.

Talauma salicifolia Miq. incl. var. *concolor*, op. cit. 258 = *Magnolia salicifolia* (S. & Z.) Maxim.

Talauma sieboldii Miq., op. cit. = p.p. *Magnolia praecocissima* Koidz. and p.p. *Magnolia quinquepeta* (Buchoz) Dandy.

Talauma spongocarpa King, Ann. Bot. Gard. Calcutta 3 (1891) 205, t. 47bis and ter. [type: Calcutta Botanical Garden *Coll. 102* (K), Upper Burma, Mymyo Hill] = *Michelia baillonii* Pierre.

Talauma stellata Miq., Ann. Mus. Bot. Lugd. Bat. 2 (1866) 257 = *Magnolia tomentosa* Thunb. [*Magnolia stellata* (S. & Z.) Maxim.]

DUBIOUS NAME

Talauma gioi A. Chev., Bull. Écon. de l'Indochine 132 (1918) 790 [type: *hb. Chevalier* 38204 (P), Nord Annam; Division de Cay Chanh] = *Michelia spec.*