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CHYDENANTHUS MIERS (LECYTHIDACEAE)

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ABSTRACT

Chydenanthus is accepted as a monotypic genus and its type species *C. excelsus* (Bl.) Miers is redescribed. *C. dentato-serratus* R. Knuth belongs to *Barringtonia* and is thus excluded from the genus.

ABSTRAK

Chydenanthus diperlakukan sebagai suatu marga yang monotipe dan pertelaan baru *C. excelsus* (Bl.) Miers disajikan. *C. dentato-serratus* R. Knuth termasuk marga *Barringtonia*, karena itu dikeluarkan dari marga ini.

The genus *Chydenanthus* was established by Miers in 1875, comprising of one species, *C. excelsus* (Bl.) Miers (basionym: *Barringtonia excelsa* Bl.). A second species, *C. dentato-serratus* R. Knuth was later described by Knuth (1939) based on a fruiting specimen collected by R. C. Bakhuizen van den Brink. It was said to differ from *C. excelsus* by its dentate-serrate leaves. I agree with Airy-Shaw (1949) that it does not belong to *Chydenanthus*; in all respects, in particular the spike-like inflorescence, it matches *Barringtonia, spicata* Bl.

The type species was earlier included in the genus *Stravadium* (A. P. De Candolle, 1828; Blume, 1851-1852). *Barringtonia vriesei* T. & B. which was established by Teijsmann and Binnendijk (1851) and later included by Miers (1875, p. 112) in the genus *Doxoma* is considered conspecific with *C. excelsus*.

Chydenanthus is characterized by its paniced inflorescence, ascendent ovules, and pubescent flowers. Another feature is the presence of minute, subulate and caducous stipules (or sometimes reduced into dots) at the base of the petioles, which are usually discernable in very young leaves.

The genus, like *Barringtonia* and *Abdulmajidia*, has one-seeded fruit. The entire seed is an embryo, consisting of the inner and outer parts, which on cross section are separated by a concentric woody ring. The seed has no cotyledons, and when germinating the plumule emerges from one end and the radicle from the other, i.e. the *Barringtonia* type germination (cf. De Vogel, *Seedlings of Dicotyledons*, 1980). The development of the embryo was amply described by Treub (1884).

CHYDENANTHUS EXGELSUS (Bl.) Miers

Chydenanthus excelsus (Bl.) Miers in Trans. Linn. Soc. London 2(1): 112, t. 17, f. 5 & 20. 1875; Niedenzu in Engler & Prantl, Nat. Pfl. Fain. 3(7): 33. 1898; Koorders & Valetton, Bijdr. Booms. Java 6, in Med. 'sLands Pl. Tuin Buitenzorg 40: 20. 1900; Boorsma in Bull. d'Agric. Ind. Neerl. 16: 10. 1908; De Clerq, Nieuw Plantk. Woordenb. Ned. Indië 199. 1909; Backer, Schoolfl. Java 54, 1911; Bekn. Fl.

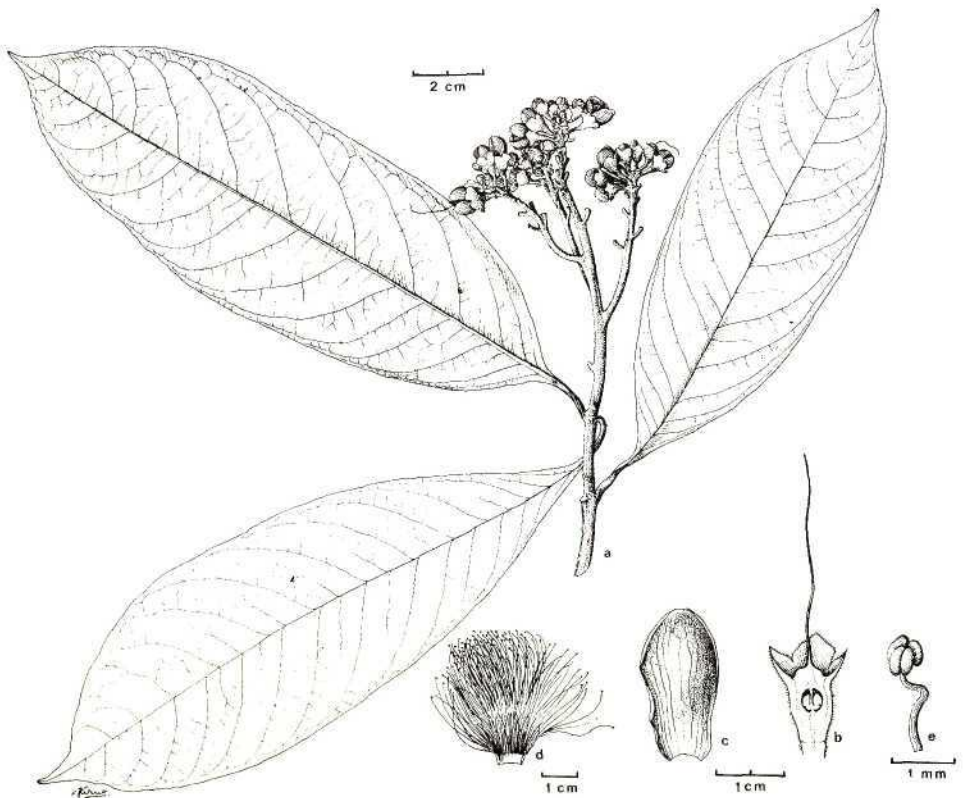


FIG. 1. *Chydenanthus excelsus* (Bl.) Miers: a) flowering branch, b) longitudinal section of calyx and ovary, c) petal, d) stamens, and e) anther. — After Koorders 25249 (a) and living specimen cultivated in the Bogor Botanical Garden, Va 5 (b-e).

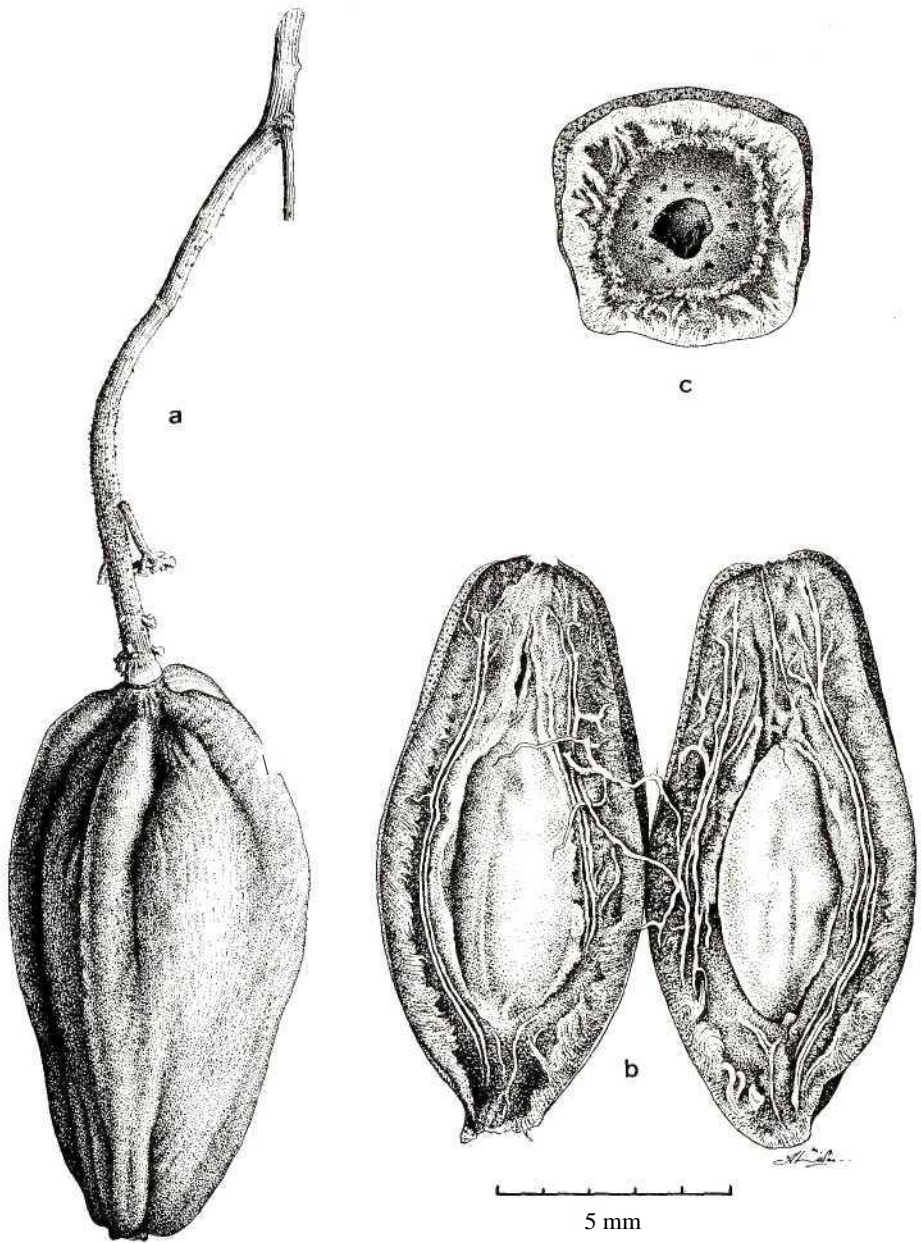


FIG. 2. *Chydenanthus excelsus* (Bl.) Miers: a) ripe fruit, b) longitudinal section, and c) cross section. Note the fibrous pericarp. — After living specimen cultivated at the Bogor Botanical Garden, Va 5.

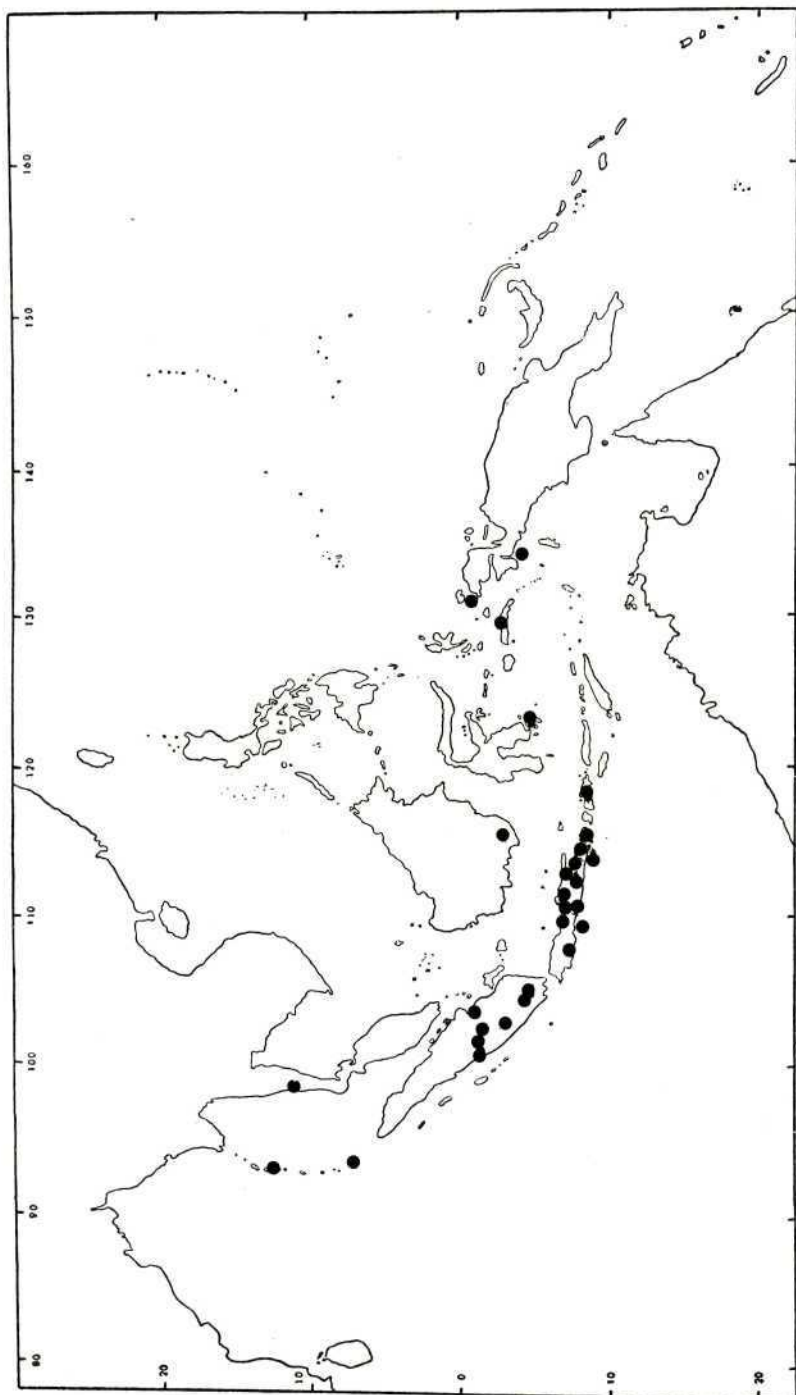


FIG. 3. Distribution of *Chydenanthus excelsus* (Bl.) Miers.

Java, Fam. 4B, 99: 5. 1944; Backer & Bakh. v.d. Brink, Fl. Java 1: 353. 1965; Koorder, Exkurs. Fl. Java 2: 666. 1912; Greshoff in Med. 'sLands Fl. Tuin Buitenzorg 25: 82. 1898; in Med. Dept. Landb. 17,3 (Suppl): 118. 1913; van Dongen in Pharm. Weekbl. 50: 446. 1913; in Meded. Kol. Inst. Amsterdam 123. 1913; Janssonius, Mikrogr. Holzer Java 3: 502. 1914; Anat. Bestimm. Java Holzer 81. 1940; Key Java Woods 84. 1952; Heyne, Nutt. Pl. Ned. Indië (ed. 1) 3: 343. 1917; (ed. 2) 2: 1161. 1927; (ed. 3) 1: 1161. 1950; Duyster in Pharm. Weekbl. 60: 777. 1923; R. Knuth in Engl. Pflanzenreich 105 (4, 219): 56, F. 12. 1939; Airy Shaw in Kew Bull. 152 (excl. syn. *B. cymosa* C. E. C. Fischer). 1949. — *Barringtonia excelsa* Blume, Bijd. 17de Stuk: 1097, 1826; Miquel, Fl. Ned. Ind. 1(1): 491. 1855; C. Mueller-Berol. in Walp. Ann. 4: 852. 1857. — *Stravadium excelsus* (Bl.) A .P. De Candolle, Prodr. 3: 289. 1828; Blume in Fl. Serres 7: 24. 1851-1852; Greshoff, I.e. 117 — Type: *Blume 1733* (L).

Careya, valida (non (Bl.) Kurz) Parkinson in For. Fl. Andam. Isl. 175. 1923.

Barringtonia vriesei Teijsmann & Binnendijk in Nat. Tijdschr. Ned. Indië 2: 308. 1851; in Ned. Kruidk. Arch. 3: 411. 1855; Miquel, Fl. Ind. Bat, 1(1): 491. 1855; C. Mueller-Berol. in Walp. Ann. 4: 854. 1857; Bisshop Grevelink, Pl. Ned. Indië 159. 1883; Niedenzu, I.e. 33; Treub in Ann. Jard. Bot. Buitenzorg 4: 101, t. 8. 1884. — *Doxoma vriesei* (T. & B.) Miers, I.e. 106.

Tree up to 30 m high, 50 cm diam., bole fluted, modular. Bark smooth, greyish brown. Branchlets up to 5 mm thick, greyish brown or brown, striate, lenticellate. Buds 3—4 mm long, pubescent. Leaves simple, alternate, penninerved, glabrous, papyraceous to coriaceous, membranaceous when young, elliptic to elliptic oblong, rarely elliptic-obovate or obovate, (4-)7 — 26 (130) X (1.2-)3 — 8 (11.5) cm, base generally cuneate, sometimes rounded; margin slightly plicate below, entire or faintly serrulate; apex acuminate, acumen up to 15 mm long, tip blunt; midrib strongly prominent beneath, prominulous or flat above; lateral nerves 7—15 pairs, angles with the midrib about 50°, prominent beneath, prominulous or sometimes obscure above, arcuate and anastomosing near margin, often branched; secondary nerves distinct, reticulation visible or sometimes obscure above; petiole not winged, flat with sharp margin above, convex below, 10—20 mm long, 2 mm thick, very dark brown, when dry, greyish brown when fresh. Stipules caducous, minute, subulate or reduced to dots.

Panicle terminal or subterminal, many flowered, up to 18 cm long. Rachis pulverulent to pubescent, greyish brown, striate, often lenticellate, \pm 5 mm diam. Pedicel velutinous, up to 5 mm long, 3 mm thick. Bracts and bracteoles velutinous outside, caducous. Bracts triangular, 5 mm long, 3 mm wide; bracteoles 2, opposite, 3 mm long, 2.5 mm wide. Calyx lobes 3—4, small, triangular, ciliate, velutinous outside, glabrous inside, connate at the base forming a funnel-shaped or slender urn-shaped tube, up to 2 cm long (after anthesis). Petals 4, longer than calyx lobes, loosely attached to the staminal tube, obovate, apex rounded, \pm 3 cm long, \pm 1.5 cm wide, veined, thinly papyraceous, membranaceous at the margin, greenish white when fresh, dark brown when dry, pulverulent to

pubescent outside (in bud). Stamens numerous, inflexed in bud, multiseriate, the inner ones shorter and sterile, the basal part connate into a tube, the entire tube caducous, glabrous, filaments yellow (fresh), very slender up to 4.5 cm long, tube 0.5 cm long. Anthers small, versatile, basifixed, ovoid to ellipsoid, bilocular, longitudinally dehiscent. Pollen grains prolate to subprolate, 41—51 X 32—39 μ , tricolpate, colpi margin thick, sexine thick, reticulate the polar region with thick and blunt sexine projection. Intrastaminal disc consists of the vertex of the ovary and a ring-like rim. Ovary inferior, bilocular, ovules ascendent, 2 in each cell, placentation central. Styles slender, as long as stamens; stigma simple or pin-head shaped.

Fruit indehiscent, generally inserted at the terminal end of the peduncle, bluntly quadrangular, elongate ellipsoid or obovoid, about 12 cm long, 6 cm wide, lenticellate or warty, puberulous, crowned by the persistent calyx; pericarp fibrous to woody, up to 1 cm thick; fruit stalk thickened, 5 cm long, 8 mm thick. Seed one, ellipsoid, hard and stone-like when dry. Embryo large; cotyledons absent.

DISTRIBUTION: Lower Burma, Andaman and Nicobar Islands, Sumatra, Java, Bali, Sumbawa, Celebes, Moluccas and New Guinea.

VERNACULAR NAMES : Putat lembek (Indon.); kayu bodoh (Sumatra: Pariaman); besole, songgom anjing (Java: Sunda); besole, brosol, blundeng, bosgol, emprak, leprak (Central and East Java); puyung-puyung (Bali); kujung (Sumbawa); kalowe (Sulawesi: Buton).

USE

The wood of this species is of little economic value. It is strong but not very durable; the specific gravity is 0.66. The bark is fatally poisonous (Grashoff, I.e.). Seeds contain chydenantine, a glycoside (Duyster, I.e.), and according to van Dongen (I.e.) they can be used as a fish poison and a medicine against diarrhoea. The phytochemical and pharmacological properties of this species are amply given by Boorsma (I.e.) and Duyster (I.e.).

ECOLOGY

The species occurs in moist areas but is more common in drier areas where the dry period with a monthly rainfall of less than 60 mm can last more than 6 months. In dry areas it grows on moist soils in valleys or along rivers. It has been recorded as occurring in primary and secondary forests as well as in planted teak forests on a variety of soils including those on limestone and peat swamp, from sea level to 600 m. It flowers and fruits throughout the year, but flowering seems to be more common from June to September and fruiting from September to January. Flowers open at night and drop early in the morning.

ANDAMAN ISLANDS. Locality not indicated, fl, fr., anno 1899, *Prain's Coll. s.n.* (CAL). NICOBAR ISLANDS. S. Nicobar, Galathea River to Pigmalion Point, coastal forests on wet places with sandy loam soils, alt. 0 m, fr., July, *Balw-khrisnan 3871* (L); N. Nicobar, Tree Top, Car Nicobar subtidal forests on moist loam soil, alt. 0 m, fl., May, *Nair 2607* (L). SUMATRA. West Sumatra, Pariaman, str., *Diepenhorst 2569 H.B.* (BO); Ayer Mancior (Air-Mancur), alt. 360 m, ster., Aug., *Beccari 762* (L); Kuantan River, near great Mokko, loam on blue lime rocks, alt. 100 m, Pebr., ster., *Koorders 10391* (BO); Riau, Indragiri, Pagerumbai, Cinako River, alt. 8 m, Oct., ster., 66. 26081 (A, BO, K, L, SING). South Sumatra, fl., *Forbes 2597* (L); Rupit River, alt. ± 250 m. fr., *Forbes 2927* (CAL), Lampung, slope of Mt. Rate Berenong, edge of ladang, alt. 400 m, Nov., fl., *Ibut 230* (BO, L, STNG); *ibid.*, Wai Lima Estate, roadside, alt. 200 m, Dec, fl. *Ibut 471* (BO, L). JAVA. Locality not indicated. *Blume 1733* (L type). West Java, Tasikmalaya, Cipatujah, riverside, valley bottom, Jan., fr., *Dransfield 1155* (BO). Central Java, East of Tegal, teak forest, along river alt. 60 m, Sept., fl., *Beum.ev 4451* (BO); Pekabngan, Subah, Oct., ster., *Koorders 11563* (BO, L); *ibid.*, Sept., fl., fr., *Koorders 11565* (BO, K, U); *ibid.*, alt. 150 m, Jan., fl., fr., *Koorders 11566* (BO); *ibid.*, June, fl., *Koorders 13363* (BO); *ibid.*, June, ster., *Koorders 13463* (BO); *ibid.*, June, fl., *Koorders 13489* (BO); *ibid.*, June, ster., *Koorders 14266* (BO); *ibid.*, Apr. fl., *Koorders 27U67* (BO); *ibid.*, May, ster., *Koorders 36801* (BO, L); *ibid.*, *Koorders 26955* (BO); *ibid.*, Margasari, limestone, alt. 100 m, Sept., fl., *Volte 4025* (BO); *ibid.*, Nov., fl., *Koorders 5416* (BO, L); Semarang, Kedungjati, teak forest, Aug, ster., *Koorders 5410* (BO, L); *ibid.*, July, ster., *Koorders 5411, 5412* (BO, L); *ibid.*, March, ster., *Koorders 5414, 100201* (BO); *ibid.*, Oct., ster., *Koorders 5423* (BO); *ibid.*, Manggar district, Deras, Sept., fl., fr., *Koorders 25249* (B, BO, L); *ibid.*, Setro Batealit, alt. 600 m, Dec, ster., Wagiman, *Ja 3725* (A, BO, L); Karangasem, north of Wirosari, teak forest, alt. 200 m, March ster., *Koorders 6415* (BO); *ibid.*, Bontar Berjo, primary forest, June, ster., *Koorders 28364* (BO); *ibid.*, teak, forest, Nov., ster., *Koorders 34147* (BO); Japara, Juwana, Taju, Ngarangan, teak forest, alt. 50 m, May, fl., *Koorders 55038, 35039* (BO); North West Muria, Setio near Pecangan, old forest, alt. 300 m, Oct, fl., fr., *Docters van Leeuwen-Rijnvaan 918* (BO); Purworejo, ster., *Vorderman A 22* (BO); Bagelen, Cangkreng, July, ster., *Vorderman s.n.* (BO); Ngorogunung, near Celebung, ster., *Kalshoven 45* (BO, L); *ibid.*, Jan., ster., *Koorders 22118* (BO, L); Cilacap, Nusakambangan, Nov., ster., *Koorders 20024* (BO, L); *ibid.*, ster., *Koorders 20215* (BO); *ibid.*, Jan., ster., *Koorders 22118* (BO, L); *ibid.*, Oct., ster., *Koorders 24553* (BO, K, U); *ibid.*, Oct., fl., *Koorders 24611* (BO, L); *ibid.*, Pebr., fr., *Koorders 26947, 26949* (BO, L); *ibid.*, Pebr., *Koorders 26948* (BO); *ibid.*, Jan., ster., *Koorders 27509* (BO); Cilacap, Cikorol, alt. 35 m, May, ster., Verduyn Lunel, *Ja 2921* (BO, L, PNH). East Java, Purwodadi, Gunung Baung, Dec, fr., *Dilmy, Soejarto, Priyanto & Wirawan 24* (A, BO, K, L, SING); Jember, Puger, Aug., fl., *Koorders 5418* (BO); *ibid.*, Sept., fl., *Koorders 5419* (BO, L); *ibid.*, 5420 (BO, K, L); *ibid.*, Rogojampi, Aug., ster., *Koorders 5421* (BO); *ibid.*, Oct., ster., *Koorders 13182* (BO); *ibid.*, March, fr., *Koorders 30080* (BO); *ibid.*, May, ster., *Koorders 39735* (BO); Jember, Nogosari, old forest, alt. 50 m, Dec, ster., *Backer 18342* (BO); *ibid.*, Kemiri Sanga, old forest alt. 100 — 250 m, Apr., fr., *Backer 30609* (BO); *ibid.*, Nov. ster., *Kalshoven 102* (BO); *ibid.*, Sabrang, alt. 15 m, May, ster., Aris, *Ja 3354* (BO, PNH); *ibid.*, Muncar, humid lowland, forest, alt. 5 m, Oct., ster., *Becking 88* (BO); *ibid.*, Curacabe near

Bangsalsari, alt. 50 m, Nov., fl., *Kctishoven 74* (BO); Pusuruan, C. Abang near Kapuh, alt. 75 m, June, ster., *Backer 8316* (BO); Surabaya, fl., *Teijsmann s.n.* (BO); Ngawi, Jan., ster., *Beumée 1295* (BO); North of Kediri, Tanjir, Aug., fr., *Grusternik 3098* (BO); *ibid.*, Utan Panjang, ster., *den Berger s.n.* (BO); Nusabarung, Oct., fl., *Koorders 5422* (BO); Gunung Lanang, near Ginandong, Febr., ster., *Boerigter 100s* (BO); Purwo, Blambangan Reserve, ster., Sept., Hoogerwerf 164 (L). Locality not indicated. *Blume 1733* (type, L); *Horsfield s.n.* (CAL). SOUTH KALIMANTAN (S. BORNEO). G. Pamaton, fr., *Korthals s.n.* (L). BALI. Candikesuma, old forest, alt. 100 m, Jan., ster., *de Voogd 1670* (BO, L, PNH); *ibid.*, lowland forest, alt. 20 m, Apr., ster., *Becking 150* (BO, L); Jembrana, fr., Dec, *Gede Ranten & Made Raditha 60/H* (BO), NUSA TENGGARA (LESSER SUNDA ISLANDS). Sumbawa, Singa, alt. 500 m, July, ster., *de Voogd 1621* (BO, L, PNH); Bangkat Munteh, alt. 46 m, Apr., ster., 66. *14014* (BO). SULAWESI (CELEBES). Buton, Kambowa, Apr., fr., Walangitang, 66. *6642* (BO); Kampung Lowolowo, fl., fl., *van Vuuren 785* (BO). MALUKU (MOLUCCAS). Ceram, Waihai, ster., *Teijsmann s.n.* (BO). IRIAN JAYA (WEST NEW GUINEA). Salawati Island, Kaloal, primary forest along river, flatland, flooded during rainy season, clay soil, alt. 0 m, Oct., fl., *Versteegh BW 4675* (BO, L); Fak-fak, Adi Island, young secondary forest on marshy peat, alt. ca. 5 m, fr., Aug., *Versteegh BW 7584* (L, LAE). CULTA. Bogor, Botanical Garden, VA. 2a, Nov., fl., *Kuswata 3* (A, BO, K, L, LAE, NY, P, SING, US); *ibid.*, VA. 5., fl., fr., *Kuswata 4* (A, BM, BO, K, L, LAE, NY, P, SING, US).

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