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FLORA MALESIANA PRECURSOR FOR THE TREATMENT OF MORACEAE 8: OTHER GENERA THAN FICUS

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SUMMARY

The tribe Artocarpeae is redefined, the tribe Soroceae is established by change of rank, and as a consequence a new tribe Antiaropsidae is established. Moreover, a new species *Antiaropsis uniflora* C.C. Berg is described. In *Artocarpus* a new species is described, *A. albobrunneus* C.C. Berg, one subspecies is raised to the rank of species, *A. brevipedunculatus* (F.M. Jarrett) C.C. Berg, and new subspecies are described in several species, *A. longifolius* Becc. subsp. *adpressus* C.C. Berg, *A. teijsmannii* Miq. subsp. *subglabrus* C.C. Berg. In *Prainea*, *P. papuana* is reduced to a subspecies, *P. limpato* (Miq.) K. Heyne subsp. *papuana* (Becc.) C.C. Berg. In *Streblus* the sections *Pseudomorus* (Bureau) Corner and *Taxotrophis* (Blume) Corner are reinstated, *S. urophyllus* is reduced to a subspecies, *S. glaber* (Merr.) Corner subsp. *urophyllus* (Diels) C.C. Berg, in *S. streblus* var. *australianus* is raised to *S. glaber* subsp. *australianus* (C.T. White) C.C. Berg, and *S. celebensis* C.C. Berg is described as a new species.

Key words: Moraceae, Artocarpeae, *Antiaropsis*, *Artocarpus*, *Prainea*, *Streblus*, Malesia.

INTRODUCTION

A precursory study on Moraceae focussed on its classification and the Asian representatives was published by Corner in 1962. It was preceded by a monographic study on *Artocarpus* and allied genera by Jarrett (1959a, b, c, 1960a, b). Corner's study was succeeded by some publications of new species for the Malesian region (Corner, 1970, 1975, 1976; Go, 1998; Kochummen, 1998) and studies by Berg (1986, 1988) dealing with delimitation of genera and tribes.

SUBDIVISION OF MORACEAE

The subdivision of the family into the tribes Artocarpeae, Castilleae, Dorsteniaeae, Ficeae, and Moreae as proposed by Berg (1988, 1998) is changed for the current treatment of the family for Flora Malesiana dividing the heterogeneous tribe Artocarpeae into three homogeneous tribes more equivalent to the other tribes, as suggested (Berg, 2001) or proposed (Berg, 2005b), but now formalized.

Artocarpeae R.Br. (1818) 454

Trees or shrubs (or climbers?), monoecious or dioecious, with or without uncinate hairs. *Leaves* alternate and spirally arranged or distichous; stipules fully amplexicaul

to lateral or intrapetiolar, free or connate. *Inflorescences* usually unisexual, axillary or cauliflorous, spicate to capitate and then clavate, globose, or discoid, pedunculate, bracteate; interfloral bracts often peltate or subpeltate varying to spathulate, clavate, rod-shaped to spine-shaped; staminate flowers numerous, with 2–4 connate tepals, stamens 1–4, straight in the bud, pistillode rarely present; pistillate flowers numerous to few, free or connate, tepals 2–4(–5) and connate or absent (in *Treculia*), ovary free or adnate to the perianth, stigmas 1 or 2. *Fruit* large, free, with a dry pericarp or ± drupaceous, indehiscent, enveloped by a fleshy perianth or embedded in the pulpy part of the infructescence. *Seed* without or with scanty endosperm, embryo curved or straight, with thick, equal or unequal cotyledons.

This tribe comprises five clearly related genera, *Artocarpus* (40–45 spp. in quite distinct subgenera: *Artocarpus* and *Pseudojaca*), *Hullettia* (2 spp.), *Parartocarpus* (2 spp.), and *Prainea* (2 spp.) in Asia (and the Pacific), and *Treculia* (3 spp.) in Africa. *Artocarpus*, *Parartocarpus*, and *Prainea* are very closely related; one could consider to unite them in a single genus with four subgenera: *Artocarpus*, *Parartocarpus*, *Prainea*, and *Pseudojaca*.

Antiaropsideae C.C. Berg, *trib. nov.*

> Arbores dioeciae. Inflorescentiae discoideae involucro bractearum imbricatarum basaliter connatarum vel urceolato bracteis dispersis basaliter connatis. Drupa dehiscens. — Typus: *Antiaropsis*.

Trees, dioecious, without uncinate hairs. *Leaves* alternate and distichous or laxly spirally arranged; lamina entire; venation subscalariform to reticulate; stipules free, lateral or to (almost?) fully amplexicaul. *Inflorescences* axillary, unisexual; receptacle discoid to urceolate, involucrate with imbricate or with few ± scattered, basally attached bracts, possibly interfloral bracts in *Antiaropsis*. *Staminate flowers* free, numerous to several, tepals 4–6, free, stamens (2–)4–6, straight in the bud, pistillode present. *Pistillate flowers* free, numerous to several or one, tepals 4–6, ovary free, stigmas filiform, 2 and equally or unequally long or 1. *Fruit* a dehiscent drupe. *Seed* without endosperm, embryo curved, cotyledons equal, rather thick, folded.

The tribe comprises two genera, *Antiaropsis*, confined to New Guinea, with two species, and *Sparattosyce*, confined to New Caledonia, with one (or two?) species.

In the structure of the inflorescences the tribe shows similarities to the tribe Castilleae from which it clearly differs in the absence of connate tepals, the non-fleshy tepals of pistillate flowers in fruit, the free dehiscent drupes, and the absence of self-pruning branches as part of the architectural model of Cook (Hallé & Oldeman, 1970; Berg, 1977). A molecular study by Datwyler & Weiblen (2004) on relationships in Moraceae suggests that this tribe has affinities to the tribes Castilleae and Ficeae. These tribes share basally attached bracts which character allows formation of involucrate receptacles or concentrations of bracts on the margins of receptacles closing off more or less the interior of the inflorescence and, therewith, may play a role in pollination as by fig wasps or thrips (Sakai, 2001; Zerega et al., 2004). However, involucrate receptacles are also found in *Trophis* (see Berg, 2001). Antiaropsideae and Castilleae have strictly unisexual inflorescences by which they essentially differ from the Ficeae with (basically)

bisexual inflorescences. These inflorescences show in the position and anthesis of the staminate and pistillate flowers still the basically cymose structure of the inflorescence in contrast to those of the other two tribes.

In the pistillate inflorescences of *Antiaropsis decipiens*, in addition to the structures which are clearly tepals, similar structures, somewhat larger and flat, occur on the receptacle; they could be regarded as interfloral bracts, but they might be 'displaced' tepals. Such 'interfloral bracts' might be present in staminate inflorescences, but they could not be detected in the material available.

Sparattosyce has been linked to *Ficus*, but Corner (1962) included both *Antiaropsis* and *Sparattosyce* in the Castilleae (previously Olmedieae), later, 1978, he made a functional link to the long-styled species of *Ficus* subsect. *Macrostyla* (see Berg, 2004). However, the long style of *Ficus macrostyla* Corner and *F. squamosa* Roxb. is likely a secondary adaptation to the rheophytic life-form of these species and not a link to an early stage of evolution of the syconium.

The cardenolides α-antiarin and antioside known from *Antiaris* have also been found in seeds of *Antiaropsis* (Bisset, 1957: 219); this may indicate affinities of *Antiaropsis* to the Castilleae. On the other hand, cardenolides are also detected in *Streblus asper* Lour. (Hegnauer, 1969).

Tribe **Soroceae** (Miq.) C.C. Berg, *stat. nov.*

Subtribe **Soroceae** Miq. (1853) 82, 112. — Type: *Sorocea* A. St.-Hil.

Trees or shrubs, dioecious (or monoecious), sometimes with uncinate hairs. *Leaves* alternate and distichous or opposite (in *Bagassa*); lamina entire to lobate; tertiary venation scalariform to reticulate; stipules free, lateral or fully amplexicaul. *Inflorescences* unisexual, axillary (or cauliflorous). *Staminate inflorescences* racemose to spicate (to subcapitate), bracteate with peltate to basal attached bracts or ebracteate; staminate flowers clearly to weakly defined with 2–4 tepals, free or basally connate; stamens 1–4, straight in the bud, pistillode usually absent. *Pistillate inflorescences* racemose to spicate to globose capitate or uniflorous with 4 connate tepals, fleshy in fruit; ovary free or fused with the perianth. *Fruit* an indehiscent drupe or a pseudodrupe (the fruit enclosed by a fleshy perianth), solitary or in globose heads. *Seed* small and with endosperm or large and without endosperm, embryo straight or curved, cotyledons equal or (very) unequal, flat or thick.

The tribe is confined to the Neotropics and comprises five genera: *Bagassa* (1 sp.), *Batocarpus* (3 spp.), *Clarisia* (3 spp.), *Poulsenia* (1 or 2? spp.), and *Sorocea* (14 spp.).

In the structure of the inflorescences, the tribe shows similarities to the tribe Moreae from which it differs in the stamens that are not inflexed before anthesis, the absence of pistillodes, and the frequent reduction of the number of stamens.

The tribe is rather diverse. The most peculiar genus is *Poulsenia* with prickles unique in the family and with elongate pluricellular trichomes also found in *Ficus*. Moreover, the stipules are relatively large and fully amplexicaul.

In the cladogram based on molecular analyses by Datwyler & Weiblen (2004) the genera included in the Soroceae are mixed with those of the Moreae, with the exception of *Poulsenia* which got nested in the Castilleae.

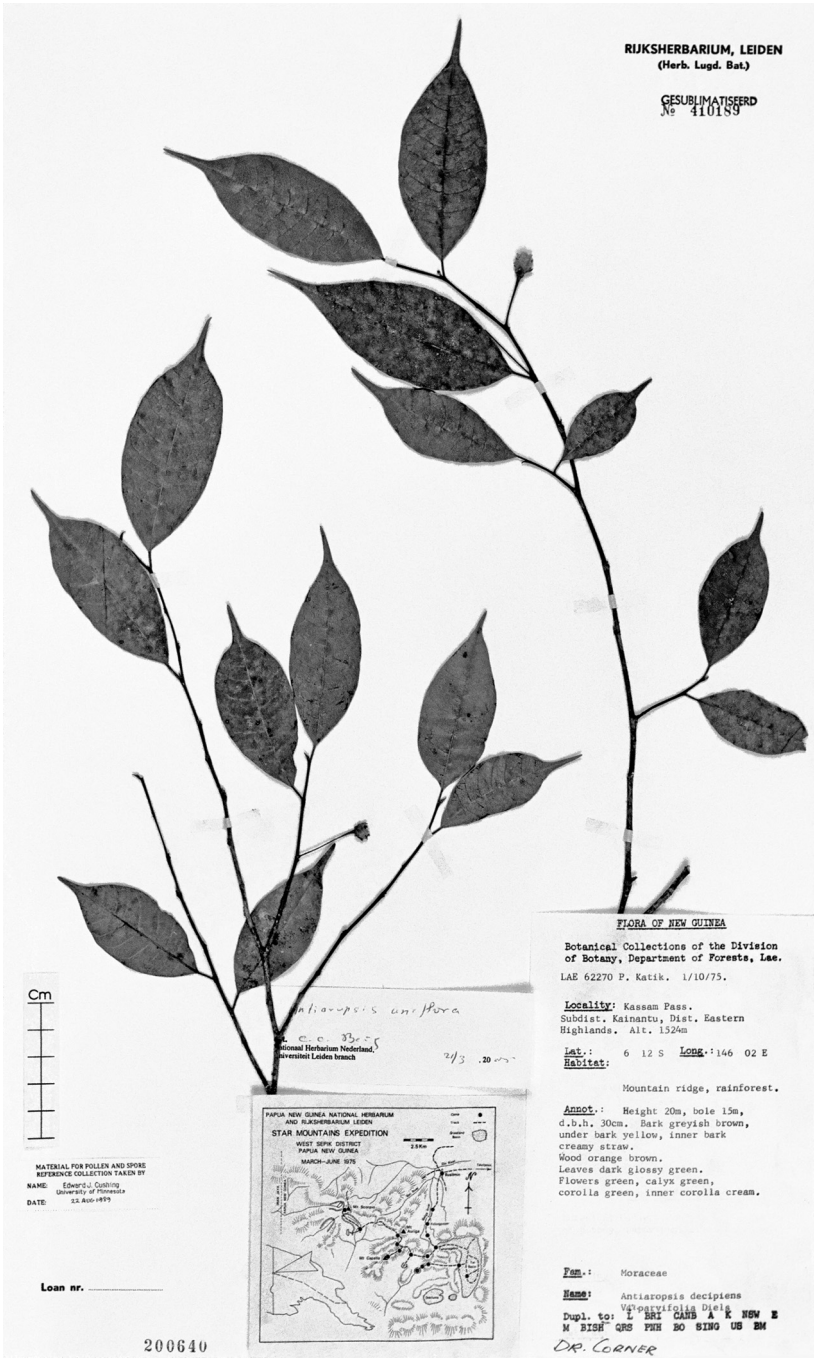

Fig. 1. *Antiaropsis uniflora* C.C. Berg. Leafy twigs with pistillate inflorescences (*P. Katik LAE 62270*, L), Papua New Guinea, Eastern Highlands Prov., Kainantu Subprov., Kassam Pass, 1524 m, 1 Oct. 1975.

ANTIAROPSIS

Antiaropsis from New Guinea was regarded as monotypic by Corner (1962): *A. decipiens* K. Schum. with a variety *parvifolia*, being distinct in the smaller lamina and the smaller number of lateral veins. As the type of the variety could not be examined, it is not certain whether it matches the collections used to describe the new species, *A. uniflora*, which is consistently distinct from lowland material included in *A. decipiens* in the habit, growing into trees of more than 20 m tall, the small leaves, up to 10 cm long, the lack of bracts on the peduncle of the pistillate inflorescences, the broader and more densely hairy involucral bracts, and the presence of a single flower, features allowing recognition at the species level.

Antiaropsis uniflora C.C. Berg, *spec. nov.* — Fig. 1

> Antiaropside decipienti in laminis parvis 3–10 cm longis, inflorescentia pistillata uniflora, pedunculo sine bracteis differt. — Typus: *P. Katik LAE 62270* (holo LAE; iso K, L, according to the label also in A, BISH, BM, BO, BRI, CANB, E, M, NSW, PNH, QRS, SING, and US), Papua New Guinea, Eastern Highlands Prov., Kainantu Subprov., Kassam Pass, 1524 m, 1 Oct. 1975.

Trees up to 23 m tall. *Leafy twigs* 1–2 mm thick, appressed puberulous. *Leaves* distichous; lamina oblong to elliptic, 3–10 by 1.5–3.5 cm, coriaceous to subcoriaceous, base (sub)cuneate, margin entire, apex acuminate to subcaudate, upper surface glabrous, lower surface sparsely appressed-puberulous on the main veins, smooth, midrib prominent above, lateral veins 8–12 pairs, tertiary venation reticulate; petiole 0.4–0.8 cm long, sparsely puberulous; stipules 0.2–0.4 cm long, puberulous, caducous. *Staminate inflorescences* unknown. *Pistillate inflorescences* axillary, solitary; peduncle 1–2.5 cm long, puberulous, without bracts; head discoid, c. 0.5 cm diameter, in fruit up to c. 1 cm diameter; involucral bracts in 4 or 5 rows, semicircular to oblong, 2–8 mm long, densely white appressed-puberulous, the inner ones obtuse. *Flower* one; tepals 4, oblong to elliptic, c. 5 mm, in fruit up to 10 mm long, ± conduplicate, appressed-puberulous, in fruit orange to red; style 1.5–2 mm long, stigmas filiform, 1.5–2 mm long. *Endocarp body* ellipsoid, c. 0.7–0.8 cm long.

Distribution — New Guinea.

Habitat — Forest; at altitudes between c. 1400 and 3200 m.

Notes — 1. As the type of *Antiaropsis decipiens* K. Schum.var. *parvifolia* Diels (1935), *Römer 867*, Papua New Guinea, 'Hellwig-Gebirge', 750 m, Nov. 1909, is not extant, it is not certain whether it belongs to this species or is just a small-leaved specimen of *A. decipiens*.

2. The contrasting colours (black of the endocarp, white of the exocarp, red of the tepals) found in *Antiaropsis decipiens* probably also occur in the new species in inflorescences in fruiting state.

3. Other specimens examined: *E.E. Henty et al. NGF 29239* (L), Papua New Guinea, Eastern Highlands Prov., Kainantu Subprov., Kassam Pass, c. 1300 m, 11 Jan. 1968, and *H. Streimann et al. 26093* (L), Papua New Guinea, Eastern Highlands Prov., Kainantu Subprov., Kassam Pass, c. 1650 m, 15 Dec. 1965.

Fig. 2. *Artocarpus albobrunneus* C.C. Berg. Leafy twigs with infructescences (*Adriansyah AA 2234*, L), Indonesia, East Kalimantan, Sakakanan River, Jl. Akbar, Km 39, March 2000.

ARTOCARPUS

Artocarpus albobrunneus C.C. Berg, *spec. nov.* — Fig. 2

Lamina coriacea apice rotundo, infructescentia in centro albide velutina peripheria rubro-brunea. — Typus: *Adriansyah AA 2243* (holo WAN; iso K, L), Indonesia, East Kalimantan, Sakakanan River, Jl. Akbar, Km 39, 13 March 2000.

Tree 15 m tall, evergreen (?). *Leafy twigs* 2–3 mm thick, sparsely minutely brown puberulous, towards the bases of the petiole more densely hairy, smooth, drying dark brown to blackish. *Leaves* distichous; lamina coriaceous, oblong to elliptic to subobovate, 6–13 by 2.5–6.5 cm, base rounded to cordulate, slightly inaequilateral, margin entire, ± revolute (towards the base), apex rounded, upper surface minutely brownish puberulous mainly on the midrib, smooth, lower surface minutely brownish puberulous in the main veins to whitish puberulous on the smaller veins, smooth, lateral veins 7–9(–10) pairs, none of them furcate far from the margin, tertiary venation scalariform, (and also the smaller veins) prominent; petiole 0.8–1.5 cm long, 1–1.5 mm thick, densely minutely brown puberulous, the epidermis flaking off; stipules lateral, 0.2–0.4 cm long, brownish puberulous, caducous. *Staminate inflorescences* not seen. *Pistillate inflorescences* axillary, solitary; (in fruit) peduncle 1.5–2.5 cm long, densely brownish puberulous; head subglobose (?); stigma simple; interfloral bracts peltate, the apical part c. 0.2 mm diameter, puberulous, persistent in the central part of the infructescence, largely caducous in the peripheral part. *Infructescences* discoid and strongly lobed around the fruits, central part whitish velutinous, peripheral part (lobes) red-brown velutinous.

Note — This species is unusual among the species of *Artocarpus* subg. *Pseudojaca* in the coriaceous lamina that dry greenish. The different colours of part of the infructescence are strange – a way to create contrasting colours to attract dispersers? These remarkable features mean that even a single collection is enough to establish a new species. The shape of the infructescence is sometimes also found in *Artocarpus lacucha* Buch.-Ham., e.g., in *D.D. Soejarto et al. 7691* (L) from Palawan (Philippines), which could be an indication of the affinities of the new species.

Artocarpus brevipedunculatus (F.M. Jarrett) C.C. Berg, *stat. nov.*

Based on *Artocarpus melinoxylus* Gagnep. subsp. *brevipedunculatus* F.M. Jarrett (1959c) 144. — Type: *G.H.S. Wood SAN A-1733* (holo K n.v.; iso A, L, according to the label also in BO, BRI, KEP, and SING), Borneo, Sabah, 1/2 mile NE of Beaufort, 6 May 1955.

Jarrett (1959c) included Bornean material in *Artocarpus melinoxylus* Gagnep. from Indochina. That material was kept in subsp. *brevipedunculatus*, but it is morphologically sufficiently distinct and phytogeographically separated to be treated as a species, distinct not only in shorter peduncles and smaller heads of the staminate inflorescence, but also in the cuneate to obtuse base of the lamina, the absence of ramification of the lateral veins and the shorter stipules.

Artocarpus longifolius Becc.

In a comment on this species, Jarrett (1960a) noted subglabrous specimens assuming that they represented (sub)juvenile material. However, two of the specimens examined,

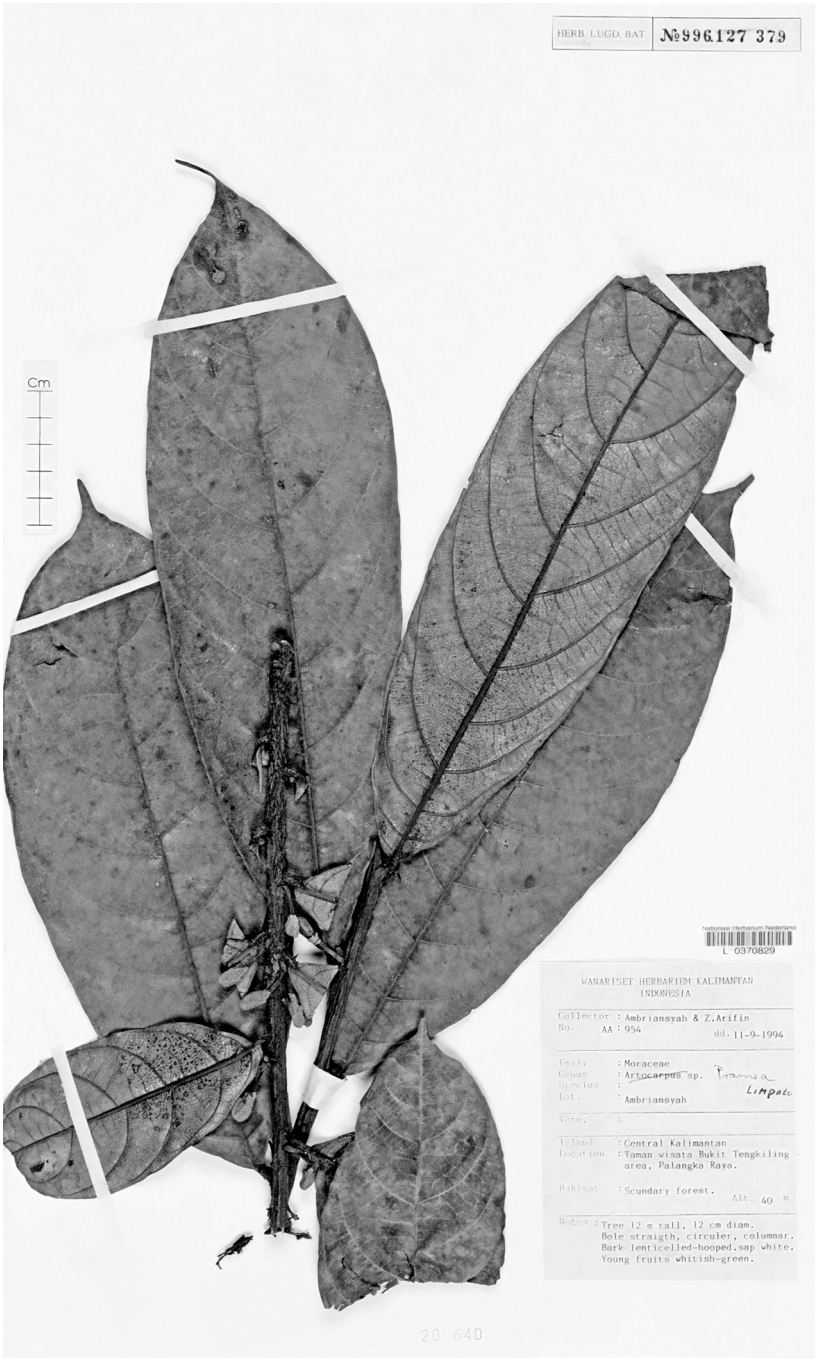

Fig. 3. *Artocarpus longifolius* Becc. subsp. *adpressus* C.C. Berg. Leafy twigs with staminate inflorescences (*Ambriansyah & Z. Arifin AA 954,* L), Indonesia, Kalimantan, Taman Wisata, Bukit Tengkiling area, Palangka, 11 Sept. 1994.

with sparsely hairy leafy twigs and laminas, bear staminate or pistillate inflorescences, the former largely similar to those of material with ± densely hairy leafy twigs and lower surface of the lamina, the latter with a much shorter, c. 0.3 cm long peduncle, in ± densely hairy specimens 2–6 cm long. These differences in indumentum (possibly linked to shorter peduncles of the pistillate inflorescences) allow distinction of subspecies, possibly eventually to separate as closely related species with short petioles with exfoliating epidermis and abundant uncinate hairs in common. More material is needed to sort out the status of these two morphological entities which are sympatric and apparently have a similar ecology.

Artocarpus longifolius Becc. subsp. **longifolius**

Lower surface of the lamina ± densely brownish puberulous to hirtellous, partly with uncinate hairs, midrib, lateral and tertiary veins mostly ± impressed above.

Distribution — Borneo.

Artocarpus longifolius Becc. subsp. **adpressus** C.C. Berg, *subsp. nov.* — Fig. 3

A subspecie typica laminis infra pilis pluribus adpressis differt. — Typus: *Ambriansyah & Z. Arifin AA 954* (holo WAN; iso L), Indonesia, Kalimantan, Taman Wisata, Bukit Tengkiling area, Palangka, 11 Sept. 1994 (m).

Lower surface of the lamina sparsely brownish to whitish appressed puberulous on the main veins, intermixed with patent to retrorse uncinate hairs, subhispidulous on the smaller veins, main veins not (never?) impressed above.

Distribution — Borneo (Brunei, Central Kalimantan).

Note — Additional collection: *N. Nagkat et al. BRUN 15511* (L), Brunei, Tutong, Telisai, Bukit Basong, 9 Nov. 1994 (f). The leaves of this collection are small (9–13 by 3.5–6 cm) and have few lateral veins (5–7 pairs).

Artocarpus teijsmannii Miq. subsp. **teijsmannii**

Leafy twigs, leaves, and stipules whitish to brownish minutely appressed-puberulous; stipules brown subsericeous to comose at the apex. *Peduncle* minutely puberulous. *Apex of the pistillate flower* pyramidate, puberulous. *Pistillate flowers* intermixed with subulate, 1–2 mm long 'processes'.

Distribution — Thailand, Nicobar Islands, Sumatra, Peninsular Malaysia, Borneo, Sulawesi, Moluccas (Ceram, Sula Islands), New Guinea (western).

Artocarpus teijsmannii Miq. subsp. **subglabrus** C.C. Berg, *subsp. nov.* — Fig. 4

A subspecie typica in ramulis foliosis atque stipulis foliisque omnibus glabris differt. — Typus: *L.S. Smith NGF 1176* (holo LAE; iso CANB), Papua New Guinea, Morobe Prov., Nadzab area, Dec. 1944 (m and f).

Leafy twigs, leaves, and stipules glabrous. *Peduncle* glabrous or with few uncinate hairs. *Apex of pistillate flower* cushion-shaped and minutely puberulous or pyramidate and puberulous only terminally. *Pistillate flowers* intermixed with peltate bracts with apices 0.3–0.5 mm diameter or very few c. 1.5 mm long subulate 'processes'.

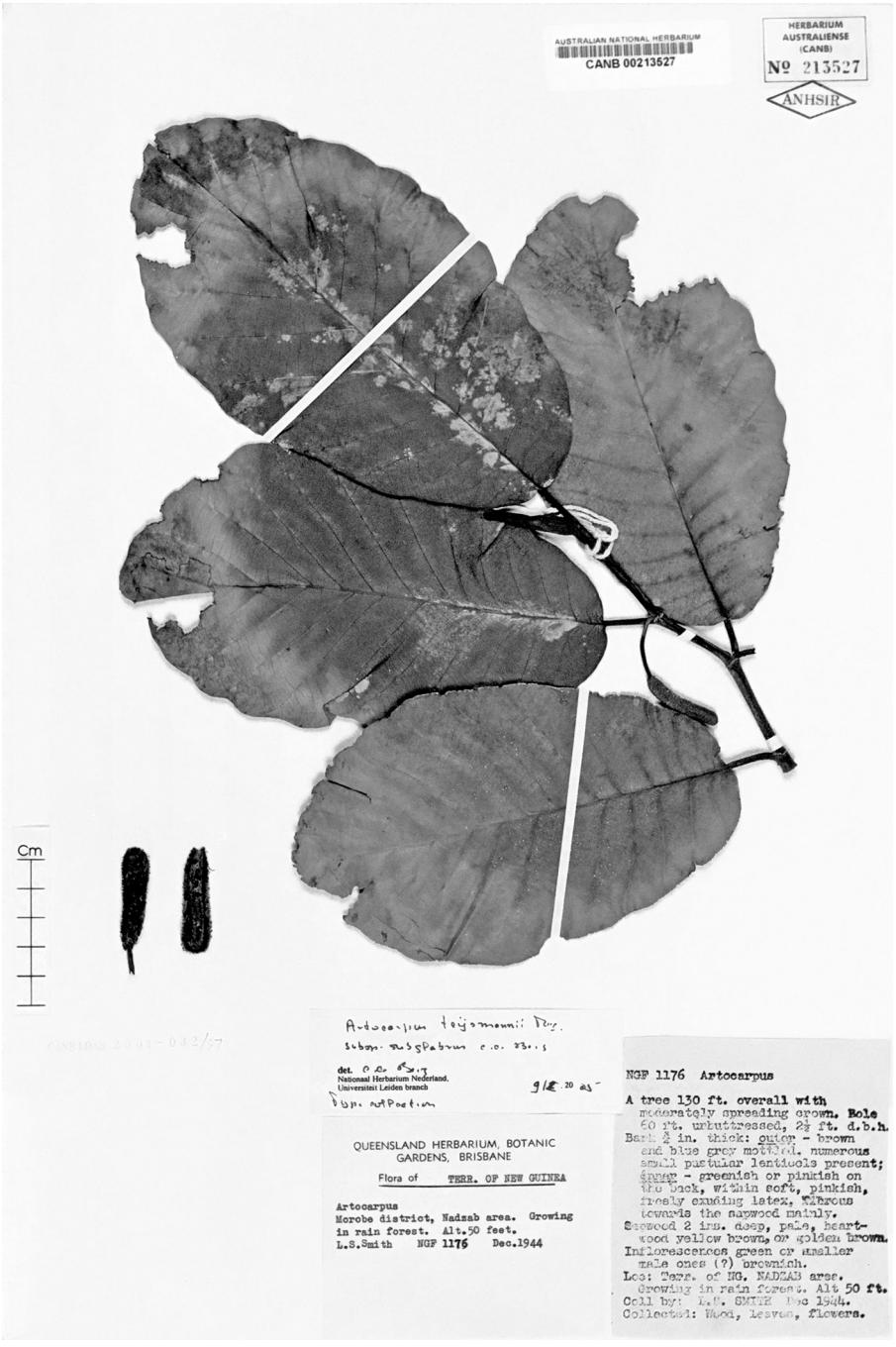

Fig. 4. *Artocarpus teijsmannii* Miq. subsp. *subglabrus* C.C. Berg. Leafy twig with staminate inflorescence and separate pistillate inflorescence (*L.S. Smith NGF 1176,* CANB), Papua New Guinea, Morobe Prov., Nadzab area, Dec. 1944.

Distribution — Papua New Guinea (Bismarck Archipelago, Morobe Province), Solomon Islands (Guadalcanal).

Notes — 1. This species is only known from two fertile collections, the type collection and *J. Boraule et al. BSIP 9301* (L), Solomon Islands, East Guadalcanal, Makina River, Marau, 9 May 1968. The lectotype of *Ficus ralumensis* Diels (Berg, 2005a) from the Bismarck Archipelago, consisting of two leaves, almost certainly belongs to this subspecies.

2. The surfaces of vegetative parts bearing short hairs in the typical subspecies are punctate in the type of the new subspecies, but smooth in the collection from the Solomon Islands.

3. The typical subspecies is quite variable with regard to the presence of peltate bracts or cylindrical 'processes' among the flowers and in the stigmas. The single staminate inflorescence known of the new subspecies has peltate interfloral bracts and the pistillate inflorescence of the type has cushion-shaped minutely puberulous apices of the pistillate flowers and peltate interfloral bracts. The collection from the Solomon Islands has pyramidate sparsely puberulous apices of the pistillate flower and few subulate 'processes'. In the type collection the stigmas are bifid and in the collection from the Solomon Islands the stigmas are simple.

PRAINEA

The four species recognised in this genus by Jarrett (1959b) showed two by two such small and largely quantitative differences that *P. frutescens* Becc. is to be included in *P. scandens* King and *P. papuana* Becc. reduced to a subspecies of *P. limpato* (Miq.) Beumée ex K. Heyne.

Prainea limpato (Miq.) Beumée ex K. Heyne subsp. **limpato**

Lamina often scabridulous beneath; lateral veins (9–)13–20(–25) pairs. *Staminate inflorescences*: peduncle 2–4(–5) cm long; head 0.8–1.3(–1.5) cm diameter. *Pistillate inflorescences*: peduncle 7–20(–25) cm long; head 1–2(–2.5) cm diameter. *Fruiting perianth* ellipsoid to ovoid, (1.2–)1.5–2(–2.5) cm long.

Distribution — Sumatra, Peninsular Malaysia, Borneo.

Prainea limpato (Miq.) Beumée ex K. Heyne subsp. **papuana** (Becc.) C.C. Berg, *stat. & comb. nov.*

Based on *Prainea papuana* Becc., For. Born. (1902) 635. — Type: *Beccari PP 675* (holo FI n.v.), New Guinea.

Lamina smooth beneath; lateral veins (8–)12–16(–20) pairs. *Staminate inflorescences*: peduncle 1.5–4 cm long; head 0.3–0.8 cm diameter. *Pistillate inflorescences*: peduncle 2–12 cm long; head (0.5–)0.8–1.5(–1.8) cm diameter. *Fruiting perianth* subglobose to ovoid, 0.8–1.3(–1.5) cm long.

Distribution — Moluccas, New Guinea.

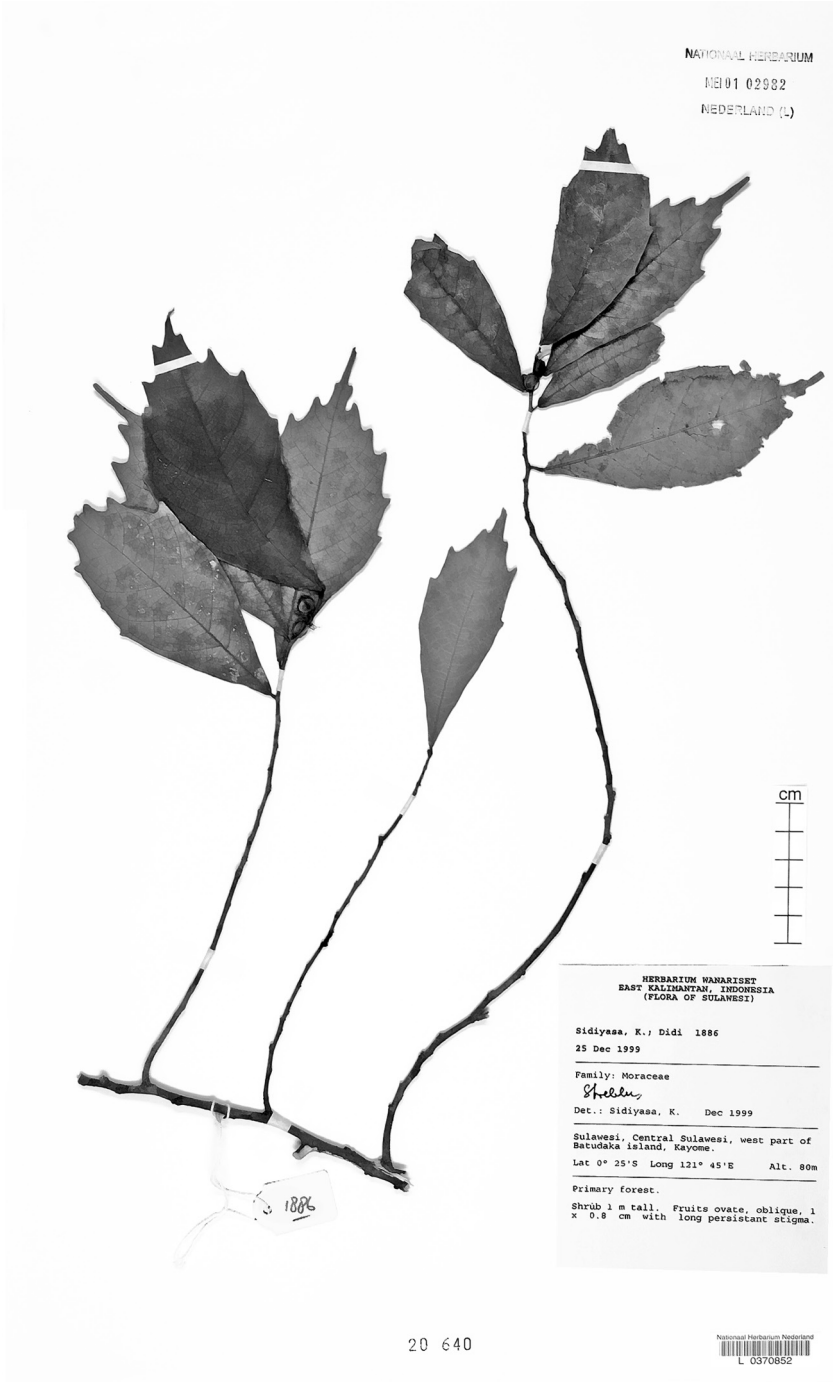

Fig. 5. *Streblus celebensis* C.C. Berg. Leafy twigs with pistillate inflorescences (*K. Sidiyasa et al. 1886*, L), Indonesia, Sulawesi, Batudaka Island, Kayome, Dec. 1999.

STREBLUS Lour.

The subdivision of the genus *Streblus* as proposed by Berg (1988) needs some corrections. The study of the Malesian species made it clear that sect. *Pseudomorus* (Bureau) Corner is to be reinstated to accommodate *S. indica* (Bureau) Corner and that sect. *Streblus* sensu Berg is too heterogeneous and that reinstatement of sect. *Taxotrophis* (Blume) Corner to accommodate the spinose species is appropriate. Section *Tetrastigma* T.H. Nguyên is to be excluded from the genus as its type *Streblus vidalii* T.H. Nguyên (1997) is not moraceous but is *Aporosa octandra* (Buch.-Ham. ex D. Don) A.R. Vickery var. *chinensis* (Champ. ex Benth.) Schot of the Euphorbiaceae.

Streblus celebensis C.C. Berg, *spec. nov.* — Fig. 5.

> Frutex espinosus dioecius partibus variis pilis atrofuscis appressis. Inflorescentiae staminatae capitatae subsessiles, tepala in alabastro valvata. Inflorescentiae pistillatae uniflorae, pedunculuque 0.2 cm longus. — Typus: *K. Sidiyasa et al. 1886* (holo WAN; iso K, L), Indonesia, Sulawesi, Batudaka Island, Kayome, Dec. 1999 (f).

Shrub, 1 m tall, without spines, dioecious. *Leafy twigs* 1–2 mm thick, puberulous, mainly with dark brown appressed hairs. *Leaves* distichous; lamina subcoriaceous, (sub)obovate, 6–15 by 2–7 cm, base obtuse, margin coarsely crenate-dentate towards the apex; upper surface (subglabrous) smooth, apex acuminate to subcaudate, lower surface sparsely appressed puberulous with dark brown appressed hairs, scabridulous, midrib prominent or prominent in a groove above, lateral veins (7–)8–10 pairs, tertiary venation subscalariform to reticulate, slightly prominent; petiole 0.3–0.7 cm long, c. 1 mm thick, puberulous with dark brown appressed hairs; stipules 1–2 mm long, subpersistent (or caducous). *Staminate inflorescences* axillary, solitary, subsessile, subcapitate with 3–5 flowers: tepals 4, valvate in the bud, c. 1.5 mm long, outside appressed puberulous with dark brown hairs, margin white tomentellous; stamens 4, inflexed in bud, anthers c. 1 mm long, pistillode obconical, c. 0.5 mm long; bracts basally attached, ovate, 1–2 mm long, appressed puberulous. *Pistillate inflorescences* axillary, solitary, uniflorous; peduncle c. 0.2 cm long; tepals 4, decussate imbricate, c. 1.5 mm long, outside appressed puberulous with dark brown hairs, margin white ciliolate; ovary c. 1 mm long, style c. 3 mm long, stigmas 2, filiform, 6–8 mm long; bracts few, basally attached, ovate, c. 0.2 mm long; tepals enlarging and probably partly enveloping the fruit at full maturity.

Notes — 1. This species belongs to sect. *Streblus* as redefined above and shows similarities in particular to the African *S. usambarensis* (Engl.) C.C. Berg (1977, 1988). It is apparently an element of rain forest undergrowth. The developing fruits are too young to describe with certainty the position of the tepals in the mature state of the fruit.

2. Section *Streblus* now comprises four species, including the widespread *S. asper* Lour. and *S. tonkinensis* (Eberh. & Dubard) Corner (incl. *S. monoicus* Gagnep. = *S. asper* var. *monoicus* (Gagnep.) Corner) from Laos and Vietnam.

3. Additional collection examined: *K. Sidiyasa et al. 1887* (K, L), Indonesia, Sulawesi, Batudaka Island, Kayome, Dec. 1999 (m).

Streblus glaber (Merr.) Corner

Within *Streblus glaber*, three subspecies are currently recognised, by reduction of *S. urophyllus*, to a subspecies and as a consequence raising the rank of var. *australianus* to that of subspecies.

Streblus glaber (Merr.) Corner subsp. **glaber**

Tree up to 25(–40) m tall. *Lamina* oblong to elliptic or to lanceolate, (1.5–)3–16 by (0.5–)1–4.5 cm, margin of the lamina usually entire, but sometimes dentate in the upper part of the lamina (in Borneo: Sabah); lateral veins 7–18 pairs.

Distribution — Peninsular Malaysia, Sumatra, Borneo (mainly Sabah), Philippines (Luzon, Mindoro, Negros), Sulawesi, Moluccas (Aru Islands), and New Guinea; extending to the Solomon Islands.

Habitat — Montane forest, sometimes on limestone or in relatively dry areas; mostly at altitudes between 700 and 2500 m, rarely down to sea level.

Note — In the Philippines, the inflorescences are usually longer (up to 3 cm long) and both staminate and pistillate inflorescences tend to have more flowers, often more than 15 or 3, respectively.

Streblus glaber (Merr.) Corner subsp. **australianus** (C.T. White) C.C. Berg, *stat. nov.*

Based on *Paratrophis australiana* C.T. White (1933) 15. — *Streblus glaber* (Merr.) Corner var. *australianus* (C.T. White) Corner (1962) 221; Chew (1989) 18. — Type: *Kajewski 1378* (holo A), Australia, Queensland, Herberton Range, 19 Nov. 1929.

Tree up to 20 m tall. *Lamina* oblong to subovate, 3–13 by 1–3.5 cm, margin of the lamina usually crenate-dentate (or also lobate); lateral veins (6–)10–15 pairs.

Distribution — Australia (NE Queensland).

Habitat — Rain forest; at altitudes up to 1000 m.

Streblus glaber (Merr.) Corner subsp. **urophyllus** (Diels) C.C. Berg, *stat. & comb. nov.*

Based on *Streblus urophyllus* Diels, Bot. Jahrb. Syst. 67 (1935) 172. — Type: *E. Mayr 791* (holo B), New Guinea, Saruwaged, Mongi-Busu, 2600 m, March 1929.

Shrub or tree up to 15 m tall. *Lamina* oblong to elliptic to subovate to lanceolate (or to subrhombic) or linear, 2–8(–15) by 0.5–3(–4.5) cm, margin of the lamina dentate to denticulate, at least two teeth in the upper part of the lamina; lateral veins 5–10 pairs, but if the lamina is linear (willow-leaf-shaped), then up to 30 pairs.

Distribution — New Guinea (eastern).

Habitat — Primary (or secondary) forest at altitudes between (1600–)2400 and 3000 m, occasionally on limestone.

Note — For this subspecies, a form with linear laminas and (therefore) numerous lateral veins has been described as *S. urophyllus* var. *salicifolius* Corner.

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