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A SYNOPSIS OF TAXONOMIC CHANGES IN APOROSA BLUME (EUPHORBIACEAE)

ANNE M. SCHOT

Rijksherbarium / Hortus Botanicus, Leiden, The Netherlands

SUMMARY

Some major nomenclatural and taxonomic changes in *Aporosa* Blume are treated, i.e., the spelling of the genus name, some new combinations, and descriptions of four new species of from West Malesia, six from New Guinea, and two new varieties from West Malesia. Notes on a number of often misunderstood species are also included.

INTRODUCTION

The Euphorbiaceous genus *Aporosa* consists of about 80 species of rather small, dioecious trees, common in the understoreys of the rain forests of Southeast Asia. The genus was monographed in Engler's Pflanzenreich by Pax & Hoffmann (1922). More recently, it has been treated per geographical unit (e.g. Airy Shaw 1975, 1980; Chakrabarty & Gangopadhyay, 1993). At present, the author is revising the taxonomy, phylogeny, and biogeography of the genus over its whole range.

As a preamble to this thesis a number of taxonomic changes are presented and discussed here, i.e.: 1) a short note on the preferred spelling of the generic name (the original *Aporosa* vs. the later *Aporusa*); 2) taxonomic notes on three often misunderstood species (followed by the appropriate reinstatements and new synonyms), some new combinations, and one excluded species; and 3) description of and notes on ten new species and two new varieties.

APOROSA Blume

The preferred spelling

In the first publication by Blume (1825: 514) the genus was spelled *Aporosa*. In Blume's second publication (1826: 6), the name was differently spelled, namely *Aporusa*. Until Airy Shaw (1966) argued a preference for the second spelling, the first was in common use. But is a correction of the original spelling needed in this case?

Article 60.1 of the International Code of Botanical Nomenclature (1994) states:

> "The original spelling of a name or epithet is to be retained except for the correction of ... errors ..."

Examples given are *Mesembryanthemum* L. and *Amaranthus* L., which were intentionally spelled as such, not erroneously so, and are thus to be retained above the philologically preferable *Mesembrianthemum* and *Amarantus*.

Brummit & Taylor (1990), who commented on the correction of genus names, concluded that only errors may be corrected. They recommend that names which cannot be proved to be erroneous must be retained as originally published.

Airy Shaw (1966) recommended the spelling *Aporusa* as the correct form based on the Greek feminine present participle '*aporousa*'. *Aporosa* would mean a derivation from the adjective '*aporos*'. Both convey the meaning difficult or confusing. However, the correct derivation and from what word it stems, or how to correctly latinise it, is not the issue, for the code also states (Art. 20.1):

> "... [The name of a genus] may be taken from any source whatever, and may even be composed in an absolutely arbitrary manner."

We only need to show whether Blume's original spelling *Aporosa* was an error or not. Airy Shaw (1966) argued for the spelling *Aporusa* by stating that this spelling was probably originally intended because of the avowed many spelling mistakes in Blume (1825), which were corrected in Blume (1826). *Aporusa*, however, was never explicitly mentioned as a correction to the spelling used in Blume (1825). Moreover, on the type sheet of Blume's type species *Aporosa frutescens* in the L herbarium, the name is distinctly spelled with an **o**, in Blume's own handwriting. The issue *Aporosa* or *Aporusa* hangs on the original intention of Blume for the spelling of his genus. The spelling of the name by Blume himself on the type sheet, and the fact that *Aporosa* was not explicitly mentioned by him as a name to be corrected, creates in my view doubt about his intention to spell the genus *Aporusa*. As there is thus no strong evidence for *Aporusa*, the original spelling should be used. Therefore, I see no reason to retain the second spelling (Blume, 1826; Airy Shaw, 1966), and will use *Aporosa*.

In this I follow a trend that was lately set in taxonomic literature for a preference of the original spelling (e.g., *Caelospermum* Blume: Johanssen, 1988).

Taxonomic notes

Three species have been misunderstood in previous literature. *Aporosa cardiosperma* (Gaertn.) Merr. and *A. leytensis* Merr. were associated with species of wrong affinity, viz. *A. latifolia* and *A. microcalyx* (= *A. octandra*). The resulting two reinstatements and two reductions are given below. Merrill (1920, 1929) described two different species under the name *A. acuminatissima*. Both species are reduced, thus solving this problematic name. One variety, *A. symplocoides* var. *chondroneura* (Airy Shaw) Airy Shaw, deserves specific status; another species, *A. chalarocarpa* Airy Shaw, is reduced to variety level. New combinations for the varieties of *A. octandra* (Buch.-Ham. ex D. Don) Vickery are given. *Aporosa aberrans* Gagnep. is excluded.

Aporosa aberrans Gagnep., Bull. Soc. Bot. France 70 (1923) 232 = **Antidesma** sp.

Note — As the name already indicated, the male flowers of this species, i.e., single and with large obconical pistillodes, are so aberrant that it does not belong in *Aporosa*. The connective of the anthers, though immature, points to *Antidesma*.

Aporosa cardiosperma (Gaertn.) Merr.

Aporosa cardiosperma (Gaertn.) Merr., J. Arnold Arbor. 35 (1954) 139. — *Croton cardiospermum* Gaertn., Fruct. 2 (1791) 120, pl. 107, f. 11. — Type: *Koenig s.n.* (L).

Aporosa lindleyana (Wight) Baill., Etud. Gén. Euph. (1858) 645; Thwaites, Enum. Pl. Zeyl. (1861) 288; Muell. Arg. in DC., Prodr. 15, 2 (1866) 473; Hook. f., Fl. Brit. India 5 (1887) 349; Pax & K. Hoffm. in Engl., Pflanzenr. 4, 147, 15 (1922) 96. — *Scepa lindleyana* Wight, Ic. Pl. Ind. (1840) t. 361. — Type: *Wight, Kew Dist. 2653* (K, L, P), S India, Kerala; syn. nov.

Aporosa affinis Baill., Etud. Gén. Euph. (1858) 645, nomen; syn. nov.

Aporosa sphaerocarpa Muell. Arg., Flora 47 (1864) 519. — Type: *Hohenacker 860* (holo P; iso L); syn. nov.

Note — Merrill (1954) made a new combination for *Croton cardiospermum*, based on a remark by Hallier (1918), who argued that *C. cardiospermum* was identical to *Aporosa latifolia* (Moon) Thwaites. Though Hallier was right in moving Gaertner's species to *Aporosa*, the globose pedicelled fruits as drawn by Gaertner (1791) point clearly to *A. lindleyana*, not to *A. latifolia*. Therefore, I reduce *A. lindleyana* to *A. cardiosperma*, and reinstate *A. latifolia*.

Aporosa chondroneura (Airy Shaw) Schot, *stat. nov.*

Aporusa prainiana King ex Gage var. *chondroneura* Airy Shaw, Kew Bull. 25 (1971) 476. — *Aporusa symplocoides* (Hook. f.) Gage var. *chondroneura* (Airy Shaw) Airy Shaw, Kew Bull. Add. Ser. 4 (1975) 42. — Type: *S 25808* (holo K; iso L).

Note — A species so easily recognised by its large leaves with white granules on the veins when dry, that I see no reason not to give it specific rank.

Aporosa falcifera Hook. f.

Aporosa falcifera Hook. f., Fl. Brit. India 5 (1887) 352; Pax & K. Hoffm. in Engl., Pflanzenr. 4, 147, 15 (1922) 83; Airy Shaw, Kew Bul. Add. Ser. 4 (1975) 30. — Type: *King's coll. 6574* (holo BM; iso BO, K, P).

Aporosa acuminatissima Merr., Pl. Elmer. Born. (1929) 142, p.p. (type only), nomen illeg., non Merr., Philipp. J. Sc. 16 (1920) 546 (= *Aporosa sphaeridiophora* Merr.). — Type: *Elmer 21048* (iso BM, BO, K, L, P); syn. nov.

Note — The double description of an *A. acuminatissima* by Merrill (1920, 1929) has caused much confusion. The first (Merrill, 1920) represents a small-leaved form of *A. sphaeridiophora*, and is restricted to the Philippines. It seems that it has been overlooked or assumed identical with the second (Merrill, 1929), which is a mixture. The type, *Elmer 21048*, is *A. falcifera*, but the specimen used for the description of the male inflorescence, *Elmer 21278*, is *A. subcaudata* Merr., which probably accounts for the confusion with this latter species (cf. Airy Shaw, 1975).

Aporosa latifolia (Moon) Thwaites

Aporosa latifolia (Moon) Thwaites, Enum. Pl. Zeyl. (1861) 288; Muell. Arg. in DC., Prodr. 15, 2 (1866) 470; Hook. f., Fl. Brit. India 5 (1887) 347; Pax & K. Hoffm. in Engl., Pflanzenr. 4, 147, 15 (1922) 96. — *Agyneia latifolia* Moon, Cat. Pl. Ceyl. (1824) 65, nomen. — Type: *Thwaites 3433* (holo BM; iso P).

See note under *Aporosa cardiosperma*.

Aporosa leytensis Merr.

Aporosa leytensis Merr., Philipp. J. Sc., Bot. 9 (1914) 368; Enum. Philipp. Flow. Pl. 2 (1923) 410. — Type: *Wenzel 614* (holo A; iso BM, L), Philippines, Leyte.

Aporosa alvarezii Merr., Philipp. J. Sc., Bot. 9 (1914) 470; Enum. Philipp. Flow. Pl. 2 (1923) 409; Airy Shaw, Enum. Philipp. Euph. (1983) 8. — Type: *FB 21245 (Alvarez)* (iso K), Philippines, Luzon; syn. nov.

Note — *Aporosa leytensis* was united with *A. microcalyx* (Hassk.) Hassk. by Pax & Hoffmann (1922) (= *A. octandra*), but I disagree: *A. leytensis* has the female flowers laxly arranged on a long inflorescence, pedicelled, 3-locular, flask-shaped, and with elongated stigmas and glabrous septae and columnella. In these characters it resembles very much *A. alvarezii* Merr.; only the leaves of *Wenzel 614* are smaller than those of *A. alvarezii*, but they have the same shape and nervation and therefore I regard *A. leytensis* and *A. alvarezii* as conspecific.

Aporosa octandra (Buch.-Ham. ex D. Don) Vickery

Note — *Aporosa octandra* is an extremely variable species. In one of its synonyms, *A. microcalyx*, some varieties were described, but the combinations and variety have not been made before in the present circumscription.

var. **chinensis** (Champ. ex Benth.) Schot, *comb. nov.*

Scepa chinensis Champ. ex Benth., J. Bot. 6 (1854) 72. — *Aporosa sinensis* Baill., Etud. Gén. Euph. (1858) 645, nomen. — *Aporosa microcalyx* (Hassk.) Hassk. var. *chinensis* (Champ. ex Benth.) Muell. Arg. in DC., Prodr. 15, 2 (1866) 472; Pax & K. Hoffm. in Engl., Pflanzenr. 4, 147, 15 (1922) 102. — *Aporosa chinensis* (Champ. ex Benth.) Merr., Lingn. Sc. J. 13 (1934) 34. — Type: *Champion s.n.* (P?, n.v.), Hong Kong.

Aporosa leptostachya Benth., Fl. Hongk. (1861) 317. — Type: *Champion s.n.* (K), Hong Kong.

Aporosa frutescens auct., non Blume: Benth., Fl. Hongk. (1861) 317.

var. **malesiana** Schot, *stat. et nom. nov.*

Scepa aurita Tul., Ann. Sci. Nat. sér. 3, 15 (1851) 254. — *Aporosa aurita* (Tul.) Baill., Etud. Gén. Euph. (1858) 645; Muell. Arg. in DC., Prodr. 15, 2 (1866) 474; Pax & K. Hoffm. in Engl., Pflanzenr. 4, 147, 15 (1922) 100. — Type: *Cuming 860* (holo P; iso A, BM, K, L), Philippines, Luzon.

Aporosa cumingiana Baill., Etud. Gén. Euph. (1858) 645, nomen (*Cuming 1724*).

Tetractinostigma microcalyx Hassk., Hort. Bogor. Descr. (1858) 55. — *Aporosa microcalyx* (Hassk.) Hassk., Bull. Soc. Bot. France 6 (1859) 714; Muell. Arg. in DC., Prodr. 15, 2 (1866) 471; Hook. f., Fl. Brit. India 5 (1887) 346; Pax & K. Hoffm. in Engl., Pflanzenr. 4, 147, 25 (1922) 101. — Type: *Hasskarl s.n.*, cult. in HB sub nom. *Leiocarpus serratus* (L?), Java, Bantam.

var. **yunnanensis** (Pax & K. Hoffm.) Schot, *comb. nov.*

Aporosa microcalyx (Hassk.) Hassk. var. *yunnanensis* Pax & K. Hoffm. in Engl., Pflanzenr. 4, 147, 15 (1922) 102. — *Aporosa dioica* (Roxb.) Muell. Arg. var. *yunnanensis* (Pax & K. Hoffm.) H.S. Kiu (= Qui Huaxing), Guihaia 11 (1991) 17. — Type: *Henry 11638* (holo K; iso L), China, Yunnan, Szemao.

Aporosa sphaeridiophora Merr.

Aporosa sphaerid[i]ophora Merr., Philipp. J. Sc., Suppl. 1 (1906) 76 [corr. Airy Shaw, Kew Bull. 23 (1969) 4]; Pax & K. Hoffm. in Engl., Pflanzenr. 4, 147, 15 (1922) 86. — Lectotype (proposed here): *FB (Barnes) 146* (iso BO, K).

Aporosa acuminatissima Merr., Philip. J. Sc. 16 (1920) 546. — Type: *FB 26185 (Amarillas)* (holo A; iso K, P); syn. nov.

See note under *Aporosa falcifera* Hook. f.

Aporosa symplocoides (Hook. f.) Gage

var. **chalarocarpa** (Airy Shaw) Schot, *stat. nov.*

Aporusa chalarocarpa Airy Shaw, Kew Bull. 20 (1966) 380; Meijer, Bot. News Bull. Sandakan 7 (1967) 34; Airy Shaw, Kew Bull. Add. Ser. 4 (1975) 34. — Type: *SAN 19411* (holo K; iso BO, L), Sabah, Tawau.

Note — *Aporosa symplocoides* and *A. chalarocarpa* differ only in the elongated infructescences, pedicels, and fruits of the latter. As I have been unable to find in *A. chalarocarpa* any differences in foliage or male inflorescence to *A. symplocoides*, in my opinion this taxon cannot be retained at species level.

NEW SPECIES

During my taxonomic studies I discovered ten new species and two new varieties, which are described below. Previous ideas that the section classification of Pax and Hoffmann (1922) is unnatural (e.g., Airy Shaw 1974a, 1974b; Chakrabarty & Gangopadhyay, 1993) are corroborated by my phylogenetic studies. A new section classification consistent with the phylogeny of the genus is still in preparation and will be published later. Consequently, the new species are here not assigned to any of the old sections.

The New Guinea species of *Aporosa* are rather problematic. Pax and Hoffmann (1922) were the first to describe any *Aporosa* from New Guinea. Their meagre descriptions and the fact that much of their original material has been destroyed, poses many difficulties on further research. Airy Shaw, for his survey of New Guinea Euphorbiaceae (1980), described many species anew, and interpreted others as Pax & Hoffmann's species. As some endemism from Pax & Hoffmann's main collection site, the Sepik area, is to be expected (cf. endemism in other genera, e.g., *Guioa*, Van Welzen, 1989), I agree with most of Airy Shaw's species. However, his interpretations of the Pax & Hoffmann species are, to me, often questionable. The new species from New Guinea described here represent my view of species relationships together with my present interpretations of Pax & Hoffmann's descriptions. I am aware that the choices are often rather subjective, and may be liable to change if new material turns up.

Aporosa alia Schot, *spec. nov.*

Aporosae granulari similis, sed foliis tantum infra ad nervationem puberulis et glandibus marginalibus provisis distincta. — Typus: *Fuchs 21230* (holo L; iso BO, K), Sarawak, 4th Div.

Aporusa granularis forma auct., non Airy Shaw: Airy Shaw, Kew Bull. 29 (1974) 283.

Tree, up to 18 m high, up to 10 cm diam. Stipules slightly oblique, caducous. Leaves 6–21 by 2–7 cm; thin, drying above and beneath (bright) greyish green; disc-like glands absent. Nervation: distinct. Indumentum: branchlets, petiole, and leaves only beneath on midrib and nerves sparsely puberulous; inflorescences puberulous. Male inflorescences: glomerules ellipsoid, spaced decreasingly towards the apex of the rhachis. Female inflorescences: flowers rather densely arranged at apical end of the rhachis. Female flower sessile; ovary 2-locular, sparsely puberulous; stigmas sessile, smooth, apex laxly laciniate. Fruit (narrowly) ovoid, 11–14 by 6–8 mm, lowly granular; pericarp 0.2–0.3 mm thick, not fleshy; septae and columnella glabrous.

Distribution — Borneo.

Habitat — In primary or secondary (mixed dipterocarp) forest, kerangas, or peat swamps. Altitude 30–400 m.

Note — The name *alia*, 'the other one', stems from the frustrating fact that all specific characters had already been used as an epithet: *A. alia* has granular fruits, like *A. granularis*, it is nearly endemic to Sarawak, like *A. sarawakensis* (see below), and is one out of several species with cuspidate, shiny green, *Symplocos*-like leaves, like e.g. *A. subcaudata*, *A. lucida*, or *A. symplocoides*.

Aporosa annulata Schot, *spec. nov.*

Aporosae ledermannianae et *A. reticulatae* affinis, sed foliis plus minusve nitidis, nervis 7–10 subter fuscatis et columnella basi hirsuta notabilis. Ab *A. carrii* indumento validiore differt. — Typus: *BW 5556* (holo L; iso BO, LAE), New Guinea, Vogelkop.

Tree, up to 20 m high, up to 30 cm in diam. Stipules slightly falcate, shortly persistent. Leaves 8–14.5 by 2.5–5 cm; thinnish, drying above and beneath greyish or brownish green; disc-like glands scattered at the base. Nervation distinct. Indumentum: branches, leaves, and inflorescences tomentose. Male inflorescences: glomerules subglobose, spaced decreasingly towards the apex of the rhachis. Female inflorescences: flowers mostly arranged at apical part of the rhachis. Female flower shortly pedicelled; ovary 2-locular, tomentose; stigmas raised, laxly papillate. Fruit ovoid, 10–12 by 7–9 mm; pericarp 0.3–0.5 mm thick; septae glabrous; columnella at base hairy.

Distribution — New Guinea.

Habitat — Primary, lowland to mid-montane forest. Altitude up to 1200 m.

Note — Named for the hairy ring around the base of the columnella.

Aporosa carrii Schot, *spec. nov.*

Aporosae ledermannianae et *A. reticulatae* affinis, sed foliis plus minusve nitidis, nervis 5–8 subter fuscatis et floribus femineis longis pedicellatis notabilis. Ab *A. annulata* indumento pauciore differt. — Typus: *Carr 13285* (holo L; iso BM, K), New Guinea, Boridi.

Tree, up to 24 m high, up to 10 cm diam. Stipules slightly falcate, shortly persistent. Leaves 5–14.5 by 2–7 cm; thickish, drying above and beneath greyish green or brown; disc-like glands scattered at the base. Nervation distinct. Indumentum: the branches, leaves, and inflorescences sparsely puberulous, glabrescent. Male inflo-

rescences: glomerules subglobose, spaced decreasingly towards the apex of the rhachis. Female inflorescences: flowers laxly arranged at base of rhachis, rather densely at apex. Female flower long pedicelled; ovary ovoid, (2- or) 3-locular, sericeous; stigmas raised, above ribbed and laxly laciniate. Fruits ovoid, immature slightly beaked, 10–12 by 9–11 mm; pericarp 0.3–0.5 mm thick; septae and columnella glabrous.

Distribution — New Guinea.

Habitat — Lower montane to montane forest. Altitude 1050–1830 m.

Note — I think that the species *A. annulata* and *A. carrii* closely resemble *A. reticulata* Pax & K. Hoffm., rather than *A. brassii* Mansf., as was suggested previously (Mansfeld, 1929; Airy Shaw, 1980). Both *A. annulata* and *A. carrii* agree with the description of *A. reticulata* in their few nerves, slightly revolute margin, often indistinct dots above, shining upper surface, puberulous lower surface, clustering of the female flowers mostly at the apical end of the rhachis, and the elongated, raised, bifid stigmata. *Aporosa brassii*, on the contrary, shares only its densely red-brown indumentum of the branches and leaves with *A. reticulata.*

It is possible that either *A. annulata* or *A. carrii* is conspecific with *A. reticulata*, but *A. annulata*, which because of its stronger indumentum would be closer, occurs in lower altitudes, and the fruit does not completely agree with Pax and Hoffmann's description. *Aporosa carrii*, on the other hand, inhabits altitudes over 1000 m, but has a lesser developed indumentum and fewer nerves. I have found only one specimen that combines an altitude of 1650 m with a densely brown-red tomentose indumentum, *Hartley 12005*, and this I have referred to *A. reticulata.*

Aporosa dendroidea Schot, *spec. nov.*

Habitu et textura *A. sphaeridiophorae* similis, ovario tomentoso et stigmate elevato dendriformique differt. — Typus: *van Balgooy 4634* (holo L; iso K), Moluccas, N Buru.

Aporosa sphaeridiophora auct., non Merr.: Airy Shaw, Kew Bull. 37 (1982) 8.
?*Aporosa nervosa* auct., non Hook. f.: Airy Shaw, Kew Bull. 37 (1982) 8.

Tree, up to 12 m high, up to 15 cm in diam. Stipules caducous. Leaves 7–16 by 3–5.5 cm; thinnish, drying above (dark) greenish grey, beneath (dark) brownish grey; disc-like glands scattered at the base. Nervation distinct. Indumentum: branchlets and leaves subglabrous, inflorescences sparsely puberulous. Male inflorescences: not seen. Female inflorescences: flowers laxly arranged throughout the rhachis. Female flower pedicelled; ovary 3-locular, sparsely puberulous; stigmas raised, lobes twice or more divided, ribbed and laxly papillate. Fruits globose, beaked, 9–12 by 9–13 mm; pericarp 0.5–1.2 mm thick; septae and columnella glabrous.

Distribution — Moluccas (Ambon, Buru).

Habitat — Primary or logged-over forest. Altitude 350–650 m.

Note — The epithet stems from the stigma that looks like a tiny many-branched tree.

Aporosa fulvovittata Schot, *spec. nov.*

Ab *A. frutescenti* foliis minoribus, inflorescentiis masculinis laxe glomerulatis, floribus femineis stigmatibus longioribus, et fructibus ovoideis in sicco fulvis vittatis differt. — Typus: *Chew & Corner (RSNB) 4532* (holo L; iso K), Sabah, Mt Kinabalu.

Tree, up to 18 m high, up to 20 cm diam. Stipules ovate, caducous. Leaves 5.5–13.5 by 2–5.5 cm; thinnish, drying above and beneath greyish green to yellow green; disc-like glands few, along the margin. Nervation distinct. Indumentum: branchlets, petiole, leaves above on midrib and beneath sparsely hairy, inflorescences very sparsely hairy. Male inflorescences: glomerules globose, spaced decreasingly towards the apex of the rhachis. Female inflorescences: only one flower apically. Female flower pedicelled; ovary 3-locular, glabrous; stigmas slightly raised, longitudinally ribbed and papillate. Fruit broadly ovoid, 9–12 by 11–14 mm, drying light yellow-brown at the sutures; pericarp 0.5–1.5 mm thick; septae and columnella glabrous.

Distribution — Borneo (Kinabalu, Trusmadi, Lawas).

Habitat — In primary or montane forest. Altitude 1200–1700 m.

Note — The name is derived from the characteristic brown with yellowish stripes on the fruit in dried state: *fulvus*, 'tawny, yellow-brown' and *vittatus*, 'longitudinally striped'.

Aporosa longicaudata Kaneh. & Hatus. ex Schot, *spec. nov.*

Ab *A. nigropunctata* nervis pluribus, inflorescentiis masculinis continuis, et floribus femineis sessilibus differt. — Typus: *Kanehira & Hatusima 12343* (holo FU; iso A, BO), New Guinea, Nabire.

Tree or shrub, up to 10 m high. Stipules slightly falcate, shortly persistent. Leaves 6.5–14 by 1.5–4.5 cm; thin, drying above dark greyish green, beneath (dark) brown; disc-like glands seldom present, along the margin. Indumentum: branchlets, leaves, nervation, and inflorescences sparsely tomentose, glabrescent. Nervation: fading. Male inflorescences: peduncled, glomerules indistinct, spaced continuously throughout the rhachis. Female inflorescences: flowers rather laxly arranged mostly at apical end of rhachis. Female flower sessile; ovary 3-locular, tomentose, glabrescent towards apex; stigmas sessile, elongated, perpendicular, straight, 1–1.5 mm long, laxly laciniate. Fruits ovoid, 10–11 by 9–10 mm; pericarp 0.5–1.2 mm thick; septae and columnella glabrous.

Distribution — New Guinea.

Habitat — In broken forest, on hillside. Altitude 10–400 m.

Note — The specimens were labelled, typified, and distributed, but Kanehira and Hatusima did not formally publish any of their Euphorbiaceae.

Aporosa lucida (Miq.) Airy Shaw

Note — *Aporosa lucida* shows geographical variability in shape and indumentum of the fruit. Airy Shaw (1978) described one variety with ellipsoid fruits. In line with this, I describe here two new varieties: one with puberulous ovaries from Java and the Sula Islands, and a 3-locular form from Borneo. All varieties are identical in vegetative and male characters. As the difference in globose and ellipsoid fruits is often caused by the number of seeds developing, and as the number of locules and indumentum of the ovary is variable in other species too [e.g., *A. nervosa* Hook. f. and *A. octandra* (Buch.-Ham. ex D. Don) Vickery], I see no reason to distinguish them on a higher level.

var. **pubescens** Schot, *var. nov.*

Formae typicae ovario pubescentes differt. — Typus: *Wiriadinata 873* (holo L; iso BO), W Java.

Female flower: ovary sparsely sericeous. Fruits sparsely hairy.

Distribution — Java, Moluccas (Sula Islands). Once found in Bangka and Kalimantan, Mentawir region.

var. **trilocularis** Schot, *var. nov.*

Formae typicae ovario triloculare differt. — Typus: *Nooteboom 4047* (holo L), Indonesian Borneo, Bukit Raya.

Female flower: ovary 3-locular; stigmas 3. Fruits globose, 3-locular, 10–11 by 10–11 mm, (lowly) granular, drying dark brown to black. Seeds 3.

Distribution — Borneo (mostly north).

Aporosa misimana Airy Shaw ex Schot, *spec. nov.*

Ex affinitate *A. ledermannianae* et *A. leptochrysandrae*, ab utraque floribus femineis (sub)sessilibus, ad basin tantum puberulis distincta. — Typus: *Brass 27800* (holo K; iso L, LAE), New Guinea, Sudest Island.

Tree, up to 15 m high, up to 20 cm in diam. Stipules slightly falcate, sometimes persistent. Leaves 8–18 by 2.5–7 cm; thin, drying above grey-green to brown, beneath (dark) brown; disc-like glands occasionally present along the margin. Nervation distinct. Indumentum: branchlets, leaves beneath, and inflorescences sparsely puberulous, glabrescent. Male inflorescences: glomerules indistinct, spaced rather continuously throughout the rhachis. Female inflorescences: flowers densely arranged throughout the rhachis. Female flower subsessile; ovary 2-locular, very sparsely puberulous, glabrescent; stigmas slightly raised, laxly papillate to laciniate. Fruits (broadly) ellipsoid, 8–10 by 7–10 mm; pericarp 0.5–1 mm thick; septae and columnella glabrous.

Distribution — New Guinea (Papuan Islands).

Habitat — In low rain forest. Altitude 60–300 m.

Note — Up till now the species has been recorded only from the Papuan Islands. I found the species in the Kew Herbarium already annotated under this name by Airy Shaw, which I therefore retain.

Aporosa parvula Schot, *spec. nov.*

Aporosae brevicaudatae similis in characteribus vegetabilibus, *A. sclerophyllae* in inflorescentiae characteribus, ambabus in statura multo minore differt. — Typus: *Milliken 1368* (holo L; iso K), Irian Jaya, Baliem Valley.

Shrub or tree, up to 6 m high, diameter not recorded. Stipules narrowly ovate, caducous. Leaves 2.5–5 by 1.5–2 cm; thickish, drying above green grey- or bluish grey, beneath (light) brown; disc-like glands seldom present, along the margin. Nervation: fading. Indumentum: branchlets, leaves beneath, and inflorescences sparsely tomen-

tose, leaves nervation tomentose. Male inflorescences: peduncled, glomerules indistinct, spaced rather continuously at apical 3/4 of the rhachis. Female inflorescences: not seen, but young infructescences with fruits rather laxly set at base of rhachis, more densely at apex. Old female flower pedicelled; ovary 2-locular, sparsely puberulous; stigmas (slightly) raised, above longitudinally ribbed, margins lowly papillate. Fruits young ovoid, c. 8 by 7 mm; pericarp 0.5–0.8 mm thick; septae and columnella glabrous.

Distribution — Irian Jaya.

Habitat — In primary (lower) montane rain forest. Altitude 1805–2100 m.

Note — This species is characteristic for its small leaves and minute male inflorescences. It can be distinguished from the almost similar *A. brevicaudata* Pax & K. Hoffm. and *A. sclerophylla* Pax & K. Hoffm. by persistence of the stipules, the different shapes of the leaves, and the size of the bracts. *Aporosa brevicaudata* and *A. parvula* share their overall leaf shape and caducous stipules, whereas *A. parvula* and *A. sclerophylla* agree in their small bracts. At this state of my studies, the combination of these three characters justifies recognition on species level. However, it is possible that future material will bridge these small gaps, and reduce one or more species to variety level.

Aporosa sarawakensis Schot, *spec. nov.*

In folio haud distincta ab *A. frutescenti* et *A. symplocoide*, sed stigmatibus prominentioribus et fructu ellipsoideo diagnoscenda. — Typus: *S 22905* (holo L; iso BO, K), Sarawak, 3th Div., Marudi.

Shrub or tree, up to 12 m high, up to 20 cm in diam. Stipules caducous. Leaves 9.5–20 by 2.5–8 cm; thin, drying above grey-green to yellowish green, beneath greyish green with lighter nervation; disc-like glands along the margin. Nervation distinct. Indumentum: branchlets and leaves glabrous, inflorescences very sparsely puberulous. Male inflorescences: glomerules globose, spaced decreasingly towards the apex of the rhachis. Female inflorescences: only one flower apically. Female flower pedicelled; ovary 3-locular, glabrous; stigmas sessile, lowly papillate. Fruit ellipsoid, 13–21 by 8–12 mm; pericarp 0.8–1.5 mm thick; septae and columnella glabrous.

Distribution — Borneo (mainly Sarawak).

Habitat — In primary, secondary, logged-over, and disturbed rain forest or belukar. Altitude low to 900 m.

Notes — This species belongs to the group with foliage identical to that of the common *A. frutescens* Blume, and differs in the more prominently raised stigmas and the ellipsoid fruit. It comprises those specimens from Borneo that have often been identified as *A. prainiana* King ex Gage because of a misinterpretation of Pax & Hoffmann's (1922) description. They state that *A. prainiana* has infructescences with single fruits, but in Gage's (1922) description it is noted that the female inflorescences of *A. prainiana* consist of few flowers, arranged *singly per bract.*

The epitheton of this species was chosen because the species seems to be very common in Sarawak, and scarce elsewhere in Borneo.

Aporosa vagans Schot, *spec. nov.*

Habitu inter *A. brassii* et *A. papuanam* intermedia, ab ambabus fructibus longe pedicellatis, (sub)globosis, laevioribus, sparse puberulis differt. — Typus: *Brass 32296* (holo A; iso K, L, LAE).

Tree, up to 21 m high, up to 45 cm diam. Stipules falcate, mostly caducous. Leaves 9–24.5 by 3–12 cm; thinnish, drying above (dark) bluish to greyish brown, beneath brown; disc-like glands scattered near the base. Nervation: distinct. Indumentum: branchlets, leaves, and inflorescences (sparsely) tomentose. Male inflorescences: glomerules ellipsoid, spaced decreasingly towards the apex of the rhachis. Female inflorescences: flowers rather laxly arranged, mostly at apical end of the rhachis. Female flower pedicelled; ovary 3-locular, tomentose; stigmas slightly raised, above laxly laciniate. Fruits ovoid to subglobose, 11–15 by 11–16 mm; pericarp 0.5–2.5 mm thick; septae and columnella glabrous.

Distribution — New Guinea.

Habitat — In secondary, fagaceous, lowland to montane rain forest. Altitude 25–1980 m.

Notes — There seem to be two forms of this species: a lowland form and a more common submontane form. The lowland form, which has a much more sparse indumentum, gradually changes into the tomentose submontane form. No other differences have been found.

The epithet means 'the wandering', and stems from the fact that the species was interpreted as *A. papuana* Pax & K.Hoffm. by Airy Shaw, *A. reticulata* Pax & K. Hoffm. by Mansfeld (1929) (probably), and at first as *A. laxiflora* Pax & K.Hoffm. by me (because of the disc-like glands and the long pedicels).

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