



A revision of the Malesian species of *Blachia* (Euphorbiaceae)

P.C. van Welzen¹

Key words

Blachia
Euphorbiaceae
Malesia

Abstract Malesia harbours one, possibly two species of *Blachia*. In the Philippines *B. philippinensis* is found and this species is not synonymous with *B. andamanica*. In literature *B. andamanica* has been recorded for west Malesia, but no specimens were seen. Based on its presence in Peninsular Thailand and the Andamans it is likely to be present in Peninsular Malaysia. The most distinct difference between both species is in the indumentum of the ovary, sparsely hairy in the lower half versus densely and completely sericeous, respectively.

Published on 6 March 2015

INTRODUCTION

Blachia Baill. is a small Southeast Asian genus of c. 12 species (depending on the species concept, see below), ranging from India and Sri Lanka in the west to Indochina and the Philippines in the east and the Andaman Islands and Thailand (and perhaps the Malay Peninsula) in the south. Typical are the absence of stipules, but axillary bud scales present at the base of side branches resemble the stipules; the often bisexual inflorescences with the flowers subumbellate per node; and the small petals and large disc lobes (or discs annular and lobed). The genus was introduced by Baillon (1858), based on *Croton umbellatus* Willd. of Sri Lanka (then Ceylon). It is classified in the subfamily *Crotonoideae* tribe *Codiaeae* by Webster (1994) and Radcliffe-Smith (2001). This was confirmed by Wurdack et al. (2005): in their parsimony based phylogenetic analysis of combined *rbcL* and *trnL-F* data of the *Euphorbiaceae* s.s., the clade *Blachia-Strophoblachia-Codiaeum-Baliospermum* is part of a big polytomy that forms the C2 group within the inaperturate crotonoids of the *Crotonoideae*.

The species concept in *Blachia* is quite difficult as the differences between the species appear to be very narrow. Morphologically, the genus can be divided into two groups. One group (*B. cotoneaster* Gagnep., *B. jatrophiifolia* Pierre ex Pax & K.Hoffm. – with *B. yaihsienensis* F.W.Xing & Z.X.Li as synonym – and *B. siamensis* Gagnep.) has small leaves, a distinct hirsute indumentum and at the base of the leaf blade 2 small stipellae or 4 or more papillae. The other group of c. 9 species (all large-leaved) lacks the stipellae/papillae and has almost no indumentum and when hairs are present then they are often sericeous. In especially this latter group the species are very much alike and synonymisation will have a domino effect, leaving a single widespread species. The two species reported to be present in Malesia (e.g., Merrill 1909, Phattarahirankanon & Chayamarit 2008), *B. andamanica* (Kurz) Hook.f. and *B. philippinensis* Merr., both part of the large-leaved group, differ in a few characters (see key) and have a disjunct distribution, therefore I will keep them separate. I do not follow Airy Shaw's concept (1983) to synonymise *B. philippinensis* with *B. andamanica*, nor do I follow Balakrishnan & Chakrabarty (1989) by making *B. denudata* Benth. a subspecies of *B. andamanica*.

Typical for *B. andamanica* are the densely sericeous ovaries. According to the description and small figure, only *B. longzhouensis* X.X.Chen also has hairy ovaries and this name might be a synonym. *Blachia philippinensis* has ovaries that are far less densely hairy in only the lower half of the ovary (upper half glabrous, though one fully hairy exception was encountered), while all other large-leaved species have glabrous ovaries, including *B. denudata*.

Morphologically there are some new generic observations when compared with the description in Radcliffe-Smith (2001). The lamina stipellae and papillae were never mentioned before. The pistillate flowers can have one to several petals and the pistillate disc is not always annular, but can be divided into distinct lobes. The seeds were reported (Radcliffe-Smith 2001) to be devoid of a caruncle, but in all seeds examined a small apical caruncle was present.

TAXONOMIC TREATMENT

Blachia Baill.

Blachia Baill. (1858) 385, nom. cons.; Thwaites (1861) 277; Benth. (1878) 226; (1880) 301; Hook.f. (1887) 402; Trimen (1898) 53; Boerl. (1900) 284; Brandis (1906) 581; T.Cooke (1908) 602; Bourd. (1908) 339; Talbot (1911) 474; Pax & K.Hoffm. (1911) 36; C.E.Parkinson (1923) 236; Gagnep. (1925) 410; Gamble (1925) 1337; Pax & K.Hoffm. (1931) 159; Airy Shaw (1969) 121; (1972) 223; Whitmore (1973) 68; Airy Shaw (1975) 57; Ramamoorthy (1976) 332; Airy Shaw 37 (1982) 9; (1983) 10; N.P.Balakr. & Chakrab. (1989) 568; Thin (1989) 16; G.L.Webster (1994) 107; Philcox (1997) 105; Radcl.-Sm. (2001) 304; Phattar. & Chayam. (2005) 126; Thin (2007) 260. — *Codiaeum* A.Juss. sect. *Blachia* (Baill.) Müll.Arg. (1866) 1118. — Type: *Blachia umbellata* (Willd.) Baill.

Bruxanellia Dennst. ex Kostel. (1836) 2002, nom. rej. — Type: *Bruxanellia indica* Dennst. ex Kostel.

Shrubs to shrubby trees, mainly monoecious; without latex. *Indumentum* simple hairs, sericeous or hirsute, often most parts glabrescent. *Stipules* absent, but axillary bud scales at base of side branches and inflorescences resemble stipules; latter ovate, glabrous (to hairy), late caducous. *Leaves* spiral, simple, glandless; petiole short, not pulvinate; blade sometimes basally with 4 or more papillae or 2 stipule-like stipellae, these often obscured by hairs; base usually slightly oblique, margin (sub)entire, penninerved. *Inflorescences* terminal (or terminal on short axillary branches) raceme-like thyrses, with per node subumbellate groups of flowers; bisexual with staminate flowers above and pistillate flowers below or unisexual; bracts absent,

¹ Naturalis Biodiversity Center, Botany, P.O. Box 9517, 2300 RA Leiden, The Netherlands; Institute of Biology Leiden, Leiden University, P.O. Box 9505, 2300 RA Leiden, The Netherlands; Peter.vanWelzen@naturalis.nl.

though usually new leaves developing at lower nodes. *Staminate flowers* pedicellate, with abscission zone in lower third or halfway; sepals (4–)5(–6), basally connected, imbricate, membranous, margin entire; petals (4–)5(–6), free, shorter than sepals, membranous; disc glands (4–)5(–6); stamens 14–24 (variability as observed in Thailand, unknown for complete range), filaments free (to adnate to each other and to disc when young), flat, tapering towards apex, anthers basifixed, 2-thecate, opening latrorsely with longitudinal slits; pistillode absent. *Pistillate flowers* pedicellate; sepals 4–6, triangular, persistent, often accrescent in fruit (not in Thailand); petals often absent, sometimes 1–5 present; disc lobes 5–6, often appearing as lobed ring; ovary (2–)3-locular, ovules single per locule; stigmas sessile, free, bifid. *Fruits* capsules, lobed or subglobose, septicidally dehiscent into 2-valved cocci; septa thickened above attachment of seeds; columella persistent. *Seeds* brown; ecarunculate to carunculate.

Distribution — Circa twelve species in tropical Asia from India to China (Hainan) to the Malay Peninsula and the Andaman Islands, also one species in the Philippines. Two species in Malesia of which one uncertain (see under *B. andamanica*).

KEY TO THE SPECIES

1. Ovaries densely sericeous; petioles seldom with transverse corky cracks; leaf blades ovate to elliptic to oblong to obovate, often various shapes present per specimen, (3.1–)7.8–17 by (1.8–)3–10 cm, length/width index 1.7–3.3, apex acuminate to cuspidate; stamens 20–24; fruits glabrescent 1. *B. andamanica*
1. Ovaries somewhat hairy in lower half (to, very exceptionally, completely hairy); petioles often (especially older ones) with transverse corky cracks; leaf blades ovate to elliptic, 4.1–9(–14.5) by 1.1–3.5(–5) cm, length/width index 2.4–4(–5.4), apex (acute to) cuspidate to caudate; stamens c. 14–20; fruits glabrous 2. *B. philippinensis*

1. *Blachia andamanica* (Kurz) Hook.f. — Fig. 1h

Blachia andamanica (Kurz) Hook.f. (1887) 403; Brandis (1906) 581; Pax & K.Hoffm. (1911) 38; Merr. (1921) 346; Gagnep. (1926) 416; Airy Shaw (1969) 121; (1972) 223; Whitmore (1973) 68; Airy Shaw (1982) 9; Phattar. & Chayam. (2005) 127, f. 27, pl. VII: 1. — *Codiaeum andamanicum* Kurz (1877) 405. — Lectotype (designated here): Kurz s.n., s.d., K000246884 (K), [India,] South Andaman, Mt Harriet. See note.

Shrubs to shrubby trees, up to 6 m high, basal diam up to 6 cm; branches arching, (dark) brown, flowering ones 1.3–3 mm thick; young parts often sparsely hairy. *Outer bark* thin, smooth to very finely cracked, light green to grey. *Axillary bud scales* 3–4.8 mm long, glabrous. *Leaves*: petiole 5–9.5 mm long, not pulvinate, glabrous to few hairs, seldom with transverse corky cracks, above sharply V-shaped in transverse section; blade ovate to elliptic to oblong to obovate, often various shapes present per specimen, (3.1–)7.8–17 by (1.8–)3–10 cm, length/width index 1.7–3.3, papyraceous to subcoriaceous, symmetric except base, base cuneate or rounded, usually slightly oblique, margin entire, usually somewhat reflexed, apex acuminate to cuspidate, subglabrous when young, glabrescent, upper surface mid green to glossy dark green, lower surface slightly paler than above to light green; venation slightly raised on both sides, secondary nerves 6–12 pairs, looped and closed near the margin, intercalary veins distinct, higher order veins reticulate. *Inflorescences* terminal (to axillary), up to 8 cm long, light green, with few hairs; buds light green. *Staminate flowers* 4.8–5.2 mm diam; pedicel 5–9 mm long; sepals (4–)5(–6), elliptic to obovate, 2–3.5 by 2–3 mm, pale green (to white), apex rounded; petals (4–)5(–6), obtriangular, 0.7–1.8 by 0.8–2 mm, glabrous, membranous, apex erose to c. 3-lobed, white to light

yellow; disc glands (4–)5(–6), obtrapezoid, 0.7–1.2 by 1.2–1.6 mm, thick, glabrous, apex 3-lobed; stamens 20–24, filaments 1.2–3 mm long, very pale light greenish, anthers elliptic or thecae separated by triangular connective, 0.6–0.7 by 0.3–0.6 mm, light yellowish. *Pistillate flowers* 2–4 mm diam; pedicel 2–5 mm long; sepals 5, ovate (to triangular), 1–2 by 0.8–1.3 mm, variable in size per flower, light green, ridged abaxially or not, glabrous to few hairs to hairs along margin; disc 5-lobed; ovary 3-locular, subovoid, 3-lobed, 1.2–1.5 mm high by 1.1–1.8 mm wide, green, densely sericeous; style short, 0.4–0.8 mm long, basally hairy, light green, stigmas 3–5.2 mm long, split except for basal 0.6–1 mm, light green. *Fruits* on elongated pedicel, up to 10 mm long, obovoid, 3-lobed, 13–14 by c. 11 mm high, young fruit somewhat winged on lobes, green to purplish tinged, few hairs, glabrescent; sepals slightly accrescent to 2.8 by 1.3 mm; style and stigmas persistent; columella c. 6 mm long. *Seeds* ± oblong, but somewhat triangular in transverse section, c. 7 by 6.2 by 6 mm, slightly marbled, caruncle present or absent.

Distribution — Thailand, Andamans. Reported by (among others) Phattarahirankanok & Chayamarit (2008) to be also present in Assam, Myanmar and the Malay Peninsula up to the Moluccas and Lesser Sunda Islands. This distribution is partly incorrect (no specimens are known from the Malay Peninsula, Borneo, Sulawesi, Moluccas and Lesser Sunda Islands) and partly based on confusion about the species concept. The specimens in the Philippines are *B. philippinensis*, those in Assam and perhaps Myanmar, Indochina (Gagnepain 1926) also belong to different large-leaved species (not revised here). However, because of the presence in Peninsular Thailand and the Andamans the species may be expected to occur in the Malay Peninsula.

Habitat & Ecology — Dry evergreen forest, mixed evergreen and deciduous forest, secondary forest, usually by streams; on limestone and quartzite or granite bedrock. Altitude: sea level up to 600 m. Flowering: January to March, July, August, November; fruiting: January, February, November.

Note — There are three Kurz collections from South Andaman in K (K000246884, K000246885, K000246886), which are all quite different in leaf shapes and presence of flowers and fruits. Therefore, they are likely to be syntypes rather than duplicates and one of them, the most profusely flowering one, is selected as lectotype.

2. *Blachia philippinensis* — Fig. 1a–g

Blachia philippinensis Merr. (1909) 277; Pax & K.Hoffm. (1911) 285; Merr. (1923) 455. — Lectotype (designated here): Curran FB 4128 (holo L; iso K), Philippines, Palawan, near Puerto Princesa. (Syntypes: Curran & Merritt FB 8369 (US), Philippines, Luzon, Pangasinan Prov.; Merritt & Darling FB 13829 (US), Philippines, Luzon, Ilocos Norte Prov., Cape Bojeador.) *Blachia andamanica* auct. non (Kurz) Hook.f.: Airy Shaw (1983) 10.

Shrubs to shrubby trees, up to 6 m high, dbh 2 cm or more; flowering branches 1–2 mm thick; young parts with very few hairs. *Axillary bud scales* 2.3–3.5 mm long, glabrous. *Leaves*: petiole 5–12 mm long, not pulvinate, green, often (especially older ones) with transverse corky cracks, then brownish green, glabrous to few hairs when young, above sharply V-shaped in transverse section; blade ovate to elliptic, 4.1–9(–14.5) by 1.1–3.5(–5) cm, length/width index 2.4–4(–5.4), subcoriaceous, symmetric to asymmetric, base cuneate, margin entire, wavy, usually somewhat reflexed, apex (acute to) cuspidate to caudate, subglabrous when young, glabrescent, upper surface glossy dark green, lower surface pale green to dull green; venation slightly raised on both sides, midrib especially raised beneath, secondary nerves 8–12 pairs, looped and closed near the margin, intercalary veins distinct, higher order

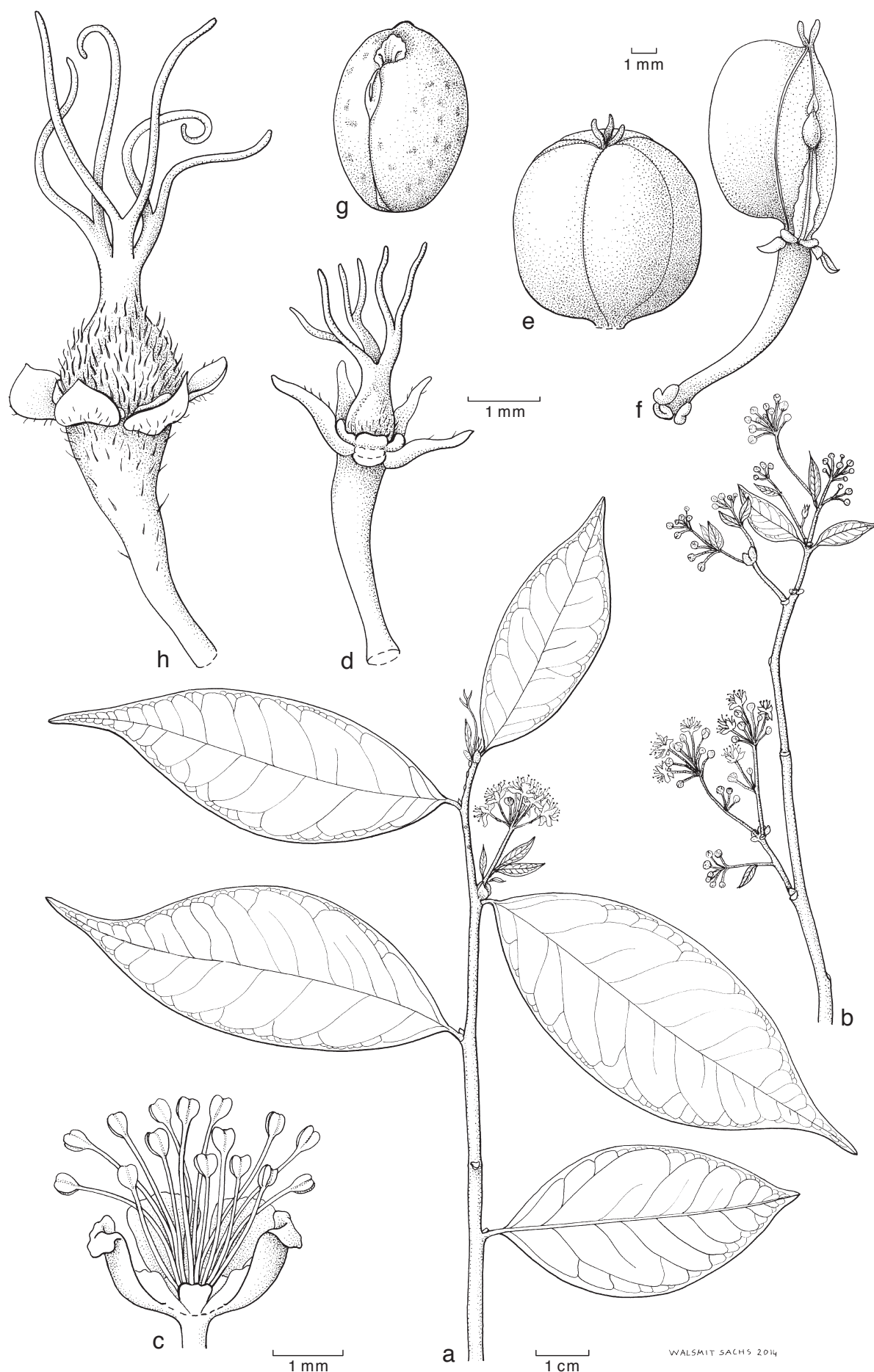


Fig. 1 *Blachia* Baill. — a–g. *B. philippinensis* Merr. a. Habit with apically one undamaged style of a pistillate flower, in umbel only staminate flowers; b. inflorescences with young leaves; c. pistillate flower showing sepals (one removed), petals (few removed), disc lobes (shorter than petals) and stamens; d. pistillate flower, ovary basally hairy; e. fruit; f. dehiscent fruit; g. seed. — h. *B. andamanica* (Kurz) Hook.f. Pistillate flower with completely hairy ovary (a–d: Curran *FB* 4128; e–g: Gaerlan *et al.* *PPI* 9914; h: Kerr 10766A; all L). — Drawing: Anita Walsmit Sachs, 2014.

veins reticulate. *Inflorescences* terminal (to axillary), up to 3 cm long, with few hairs; buds green. *Staminate flowers* c. 3.5 mm diam; pedicel 7–7.5 mm long; sepals 4–5, elliptic, c. 2.3 by 1.5 mm, white, apex rounded; petals 5, obovate, c. 0.9 by 0.6 mm, glabrous, membranous, apex slightly emarginate; disc glands 5, obtrapezoid, c. 0.9 by 0.8 mm, thick, glabrous, apex slightly 3-lobed; stamens c. 14–20, filaments c. 2 mm long, slender, slightly thickened basally, anthers elliptic, c. 0.4 by 0.4 mm. *Pistillate flowers* c. 2.5 mm diam, green; pedicel 3–4 mm long; sepals 5, triangular, 1.5–2.5 by 0.6–0.8 mm; petals 1–5, in young flower hardly visible, clear in fruit, triangular to ovate, c. 0.7 by 0.3–0.4 mm; disc lobes 5 when young; ovary 3-locular, ovoid, 3-lobed, c. 0.8 mm high by 0.8 mm wide, somewhat hairy in lower half (to completely hairy; see note); style short, 0.5–0.8 mm long, glabrous, stigmas 1.7–2.8 mm long, split except for basal 0.4–0.8 mm. *Fruits* on elongated pedicel, up to 10 mm long, obovoid, 3-lobed, c. 10 by 10 mm high, green when young, glabrous; sepals, petals, style and stigmas persistent, not enlarging; columella 6–7 mm long, apically not enlarged and T-shaped. *Seeds* ± oblong, but somewhat triangular in transverse section, c. 8 by 5.5 by 5 mm, slightly marbled, caruncle present.

Distribution — Philippines (Palawan, Luzon).

Habitat & Ecology — Along edge of forest, lowland mixed forest along river, soil clay. Altitude: 300–450 m. Flowering: February to April, September; fruiting: February, August.

Vernacular name — Pafigapien (Iloko/Ilokana; Merrill 1923).

Note — The specimen *Loher 4642* from the Philippines is the only specimen seen so far that has ovaries completely hairy instead of only hairy in the lower half. This specimen still has relatively small leaves, petioles with corky transverse cracks and the apices of the laminas are acute to acuminate.

Acknowledgements The directors and keepers of BRI, K, L, NY, US are thanked for use of their collections. I am grateful to Anita Walsmit Sachs for the beautiful drawing and to the reviewers for improvements of the manuscript.

REFERENCES

- Airy Shaw HK. 1969. Malesian and other Asiatic Euphorbiaceae. *Kew Bulletin* 23: 1–131.
- Airy Shaw HK. 1972. The Euphorbiaceae of Siam. *Kew Bulletin* 26: 101–363.
- Airy Shaw HK. 1975. The Euphorbiaceae of Borneo. *Kew Bulletin, Additional Series* 4: 1–245.
- Airy Shaw HK. 1982. The Euphorbiaceae of Central Malesia (Celebes, Moluccas, Lesser Sunda Is.). *Kew Bulletin* 37: 1–40.
- Airy Shaw HK. 1983. An alphabetical enumeration of the Euphorbiaceae of the Philippines Islands. The Royal Botanic Gardens, Kew.
- Baillon MH. 1858. *Étude générale du groupe des Euphorbiacées*. Victor Masson, Paris.
- Balakrishnan NP, Chakrabarty T. 1989. Genus *Blachia* Baill. (Euphorbiaceae) in India. *Proceedings of the Indian Academy of Sciences (Plant Science)* 99: 567–578.
- Bentham G. 1878. Notes on Euphorbiaceae. *The Journal of the Linnean Society* 17, Botany: 185–267.
- Bentham G. 1880. CLI. Euphorbiaceae. In: Bentham G, Hooker JD (eds), *Genera Plantarum* 3: 239–340. Reeve & Co., London.
- Boerlage JG. 1900. Handleiding tot de kennis der Flora van Nederlandsch Indië. Firma voorheen E.J. Brill, Leiden.
- Bourdillon TF. 1908. The forest trees of Travancore. Travancore Government Press, Trivandrum.
- Brandis D. 1906. Indian trees. Archibald Constable & Co. Ltd., London.
- Cooke T. 1908. The Flora of the Presidency of Bombay 2. Taylor & Francis, London.
- Gagnepain F. 1925. Euphorbiaceae. In: Lecomte MH (ed), *Flore Générale de l'Indo-Chine* 5: 229–673. Masson & Cie., Paris.
- Gamble JS. 1925. Flora of the Presidency of Madras. Secretary of State for India, London.
- Hooker JD. 1887. The Flora of British India 5. Reeve & Co., London.
- Kosteletsky VZ. 1836. Allgemeine medizinisch-pharmazeutische Flora. Borrosch & André, Prag.
- Kurz WS. 1877. Forest Flora of British Burma 2. Office of the Superintendent of Government Printing, Calcutta.
- Merrill ED. 1909. New or noteworthy Philippine plants, VII. *The Philippine Journal of Science* 4, Botany: 247–330.
- Merrill ED. 1921. A bibliographic enumeration of Bornean plants. *Journal of the Straits Branch of the Royal Asiatic Society, Special Number*.
- Merrill ED. 1923. An enumeration of Philippine flowering plants 2. Bureau of Printing, Manila.
- Müller Argoviensis J. 1866. Euphorbiaceae excl. Euphorbieae. In: De Candolle A (ed), *Prodromus Systematis Naturalis Regni Vegetabilis* 15, 2: 189–1260. Masson & Fili, Paris.
- Parkinson CE. 1923. A forest Flora of the Andaman Islands. Government Central Press, Simla.
- Pax F, Hoffmann K. 1911. Euphorbiaceae-Cluytieae. In: Engler A (ed), *Das Pflanzenreich* IV.147.iii. Engelmann, Leipzig.
- Pax F, Hoffmann K. 1931. Euphorbiaceae. In: Engler A, Harms H (eds), *Die natürlichen Pflanzenfamilien* ed. 2, 19c: 11–233. Engelmann, Leipzig.
- Phattarahirankanok K, Chayamarit K. 2005. *Blachia*. In: Chayamarit K, Van Welzen PC (eds), *Flora of Thailand* 8, 1: 126–130, f. 27, 28, pl. VII: 1, 2. The Forest Herbarium, Bangkok.
- Philcox D. 1997. Euphorbiaceae. In: Dassanayake MD (ed), *A revised handbook to the Flora of Ceylon* 10: 80–283. Balkema, Rotterdam.
- Radcliffe-Smith A. 2001. *Genera Euphorbiacearum*. The Royal Botanic Gardens, Kew.
- Ramamoorthy TR. 1976. Euphorbiaceae. In: Saldanha CJ, Nicolson DH (eds), *Flora of Hassan District, Karnataka, India*. Amerind Publishing Co. Pvt. Ltd., New Delhi.
- Talbot WA. 1911. Forest Flora of the Bombay Presidency and Sind 2. Government at the Photozincographic Department, Poona.
- Thin NN. 1989. *Tribus Codiaeae* (Pax) Hutch. in Vietnam. *Journal of Biology (Vietnam)* 11: 14–17.
- Thin NN. 2007. Taxonomy of Euphorbiaceae in Vietnam. Vietnam National University Publishers, Hanoi.
- Thwaites GHK. 1861. *Enumeratio Plantarum Zeylanicae*. Dulau & Co., London.
- Trimen H. 1898. A hand-book to the flora of Ceylon 4. Dulau & Co., London.
- Webster GL. 1994. Synopsis of the genera and suprageneric taxa of Euphorbiaceae. *Annals of the Missouri Botanical Garden* 81: 33–144.
- Whitmore TC. 1973. *Tree Flora of Malaya* 2: 34–136. Longman, London.
- Wurdack KJ, Hoffmann P, Chase MW. 2005. Molecular phylogenetic analysis of uniovulate Euphorbiaceae (Euphorbiaceae sensu stricto) using plastid *trnL* and *trnL-F* DNA sequences. *American Journal of Botany* 92: 1397–1420.

IDENTIFICATION LIST

This list only contains collections with collector names and collector numbers. The number after the colon refers to the following species:

- 1 = *Blachia andamanica*
2 = *Blachia philippinensis*

- BS series 45929: 2.
FB series 4128: 2; 8369: 2; 13829: 2; 29226: 2.
Kerr 8765: 1; 10766A: 1; 17371: 1; 17669: 1; 20534: 1.
Larsen et al. 3055: 1 – Lete 339: 2 – Loher 4642: 2.
Maxwell 95-78: 1 – Merrill 1374: 2 – Middleton et al. 1243: 1; 2455: 1; 2459: 1; 2488: 1.
Nair 4916: 1.
PNH series 18027: 2 – PPI series 9914: 2; 25218: 2; 25224: 2; 25229: 2 – Pooma et al. 6374: cf. 1.
Van Beusekom & Santisuk 2721: 1; 2834: 1.