

Studies in *Macaranga* VII*

The genus in 'Greater India'

by

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Summary

Only 12 *Macaranga* are known from 'Greater India', these are keyed out and annotated. Several remain very inadequately collected. *M. gmelinifolia* is reduced to *M. pustulata* and confusion between *M. indica* and *M. peltata* is resolved.

Introduction

The term 'Greater India' is used in this paper with no political connotations as a convenient designation for the Indian subcontinent north to the Tibetan frontier, plus Ceylon, the Andaman & Nicobar Islands and Burma. Airy Shaw (*Kew Bull.* 26 (1971) 191–363) has enumerated *Macaranga* for Thailand and the present author for Malaya (*Tree Flora of Malaya* 2 (1973) 106–13). The present contribution extends these studies westwards to the Asian limit of the genus.

In Greater India *Macaranga* is far less rich and diverse than further south and east. The fragmentary ecological notes on collecting labels suggest most species (perhaps all) are gregarious pioneer trees of secondary forest. There are a few slim indications that they are restricted to rain forest and monsoon forest. Further, they extend to elevations which suggest occurrence in lower montane as well as lowland rain forest.

The account is based on the collections at K and BM. There is little material from later than the second decade of this century. In fact, of the thirteen recorded species, only *M. denticulata*, *M. indica*, *M. peltata* and *M. pustulata* are well represented. *M. conifera* is included on the word of Kurz. A second collection is recorded of *M. gamblei*, previously known only from the type.

The recent discovery in the Nicobar and Andaman Islands of *M. nicobarica*, a new species related to *M. gigantea* of West Malesia, suggests that there may be more species awaiting discovery or ranges awaiting extension, and that, just as in Malaya, an observant forest botanist could gather a rich harvest in this genus of conspicuous, gregarious, wayside trees.

Abbreviations

The principal publications are abbreviated in the enumeration as follows:

1. Airy Shaw — in *Kew Bull.* 26 (1971) — i.e. Euphorbiaceae of Siam.
2. Brandis, D. — *Indian Trees* (1906).
3. Cowan, A. M. & Cowan, J. M. — *The Trees of Northern Bengal*. Revised by J. S. Gamble (1929).

* continued from *Kew Bull.* 29(1974) 445-50.

4. Gamble, J. S. — Flora of the Presidency of Madras 2 (7) (1925).
5. Haines, H. H. The Botany of Bihar & Orissa (1925).
6. Hook, f. — in Hook. f., Fl. Brit. Ind. 5 (1887).
7. Kurz, S. — Forest Flora of British Burma 2 (1877).
8. Muell. Arg. — in DC., Prodr. 15 (2) (1866).
9. Pax & Hoffh. — in Engl., Pflanzenr. IV. 147 (1914).
10. Trimen, H. — A Handbook to the Flora of Ceylon. 4 (1898).
11. Whitmore, T. C. 1973 — Tree Flora of Malaya 2 (1973).
12. Whitmore, T. C. 1975 — *Macaranga*: in The Euphorbiaceae of Borneo. Kew Bull. Addit. Ser. 4.

Key to Macaranga species in Greater India

1. Leaves peltate at base 2
 Leaves not peltate at base 6
2. Stipules persistent 3
 Stipules immediately or soon caducous 4
3. Leaves below with reddish granular gland dots, sparsely pilose. Bracteoles entire (male) or shallowly irregularly dentate (female). Fruits smooth **M. nicobarica**
 Leaves below not granular glandular, finely velvety. Bracteoles densely toothed. Fruits spiny **M. tanarius**
4. Leaves with broadly truncate base; basal pair of secondary nerves rather straight; tertiary nerves scalariform, raised, pale, conspicuous on lower surface. Fruits 2-shouldered with short persistent stigmas. Twigs coarsely striate, ochre-fawn tomentose at first **M. denticulata**
 Leaves with rounded base; basal pair of secondary nerves markedly curved; tertiary nerves not regularly scalariform, not strongly conspicuous, Fruits usually globose, style eccentric. Twigs not coarsely striate, often slightly glaucous 5
5. Leaves usually with 2 large glands near petiole insertion. Bracteoles linear, with a conspicuous apical gland. Fruits *c.* 2 mm diam., pedicel 10 mm, borne on secondary branches; infructescences pyramidal, forming a tangled mass **M. indica**
 Leaves never with such glands. Bracteoles ovate, dentate. Fruits *c.* 4 mm diam, pedicel 20 mm, borne on primary branches; infructescences oblong, more or less discrete **M. peltata**
6. Some or all leaves with 3-5 lobes 7
 Leaves not lobed 8
7. Most leaves with 5 lobes, drying beetroot-red beneath. Fruits horned **M. quadricornis**
 Leaves with 3 lobes. Fruits softly spiny, enclosed in leafy bracts **M. kurzii**
8. Leaves palmately nerved 9
 Leaves pinnately nerved 10
9. Leaves with 2 glands at petiole insertion; truncate to subcordate. Fruits shouldered. Tree **M. pustulata**
 Leaves without such glands; truncate. Fruits spiny. Sarmentose shrub **M. trichocarpa**

- 10. Petioles 10 mm 11
 Petioles 20 mm or more 12
- 11. Inflorescences simple, lateral; male thread-like; female capitate, with persistent leafy bracts **M. andamanica**
 Male inflorescences compound, terminal (female unknown) **M. gamblei**
- 12. Leaves cuspidate **M. digyna**
 Leaves acuminate **M. conifera**

Macaranga andamanica Kurz: 389 (1877); Pax & Hoffm. vii: 365 (1914); Parkinson, For. Fl. Andaman Is.: 238 (1923); Airy Shaw in Kew Bull. 19: 318 (1965) & 26: 287 (1971); Whitmore in Malayan Nature Journ. 20: 95 (1967), Biol. Journ. Linn. Soc. 1: 225 (1969) & in Tree Flora Malaya 2: 112 (1973).

M. brandisii King ex Hook. f.: 453 (1887); Brandis: 592 (1906); Pax & Hoffm. loc. cit. (1914).

M. bracteata Merr. in Lingnan Sci. Journ. 6: 281 (1928).

? *M. rosuliflora* Croiz. in Journ. Arn. Arb. 23: 51 (1942).

Lower Burma, Andaman Isl., S. China (Yunnan, Hainan), Indochina (Tonkin), Thailand, Malaya.

A typical species of Sect. *Pseudo-Rottlera*.

Macaranga conifera (Zoll.) Muell. Arg.: 1005 (1866). Pax & Hoffm. vii: 392 (1914). Whitmore: 112 (1973) &: 157 (1975).

Mappa conifera Zoll. in Linnaea 29: 466 (1857).

Pachystemon populifolius Miq., Fl. Ind. Bat. Suppl.: 462 (1861).

M. populifolia (Miq.) Muell. Arg.: 1006 (1866); Kurz: 381 (1877); Hook. f.: 450 (1887); Pax & Hoffm. vii: 322 (1914).

Andamans (fide Kurz), Malaya, Sumatra, Borneo.

The only record is that of Kurz, which is entirely plausible both to location and identity.

Macaranga denticulata (Bl.) Muell. Arg.: 1000 (1866); Kurz: 387 (1877); Hook. f.: 446 (1887); Brandis: 591 (1906); Pax & Hoffm. vii: 334 (1914); Haines: 108 (1925); Cowan & Cowan: 120 (1929). Whitmore in Malayan Nature Journ. 20: 94, 96 (1967) and in Tree Flora Malaya 2: 111 (1973); Airy Shaw: 288 (1971).

? *Trewia hernandiifolia* Roth, Nov. Pl. Sp.: 374 (1821).

Mappa denticulata Bl., Bijdr.: 625 (1825).

Rottlera glauca Hassk. in Flora 25. ii Beibl. 2: 41 (1842).

Mappa gummiiflua Miq., Fl. Ind. Bat. Suppl.: 430 (1858).

M. wallichii Baill., Ét. Gén. Euphorb.: 430 (1858).

M. truncata Muell. Arg. in Linnaea 34: 198 (1865).

Macaranga gummiiflua (Miq.) Muell. Arg.: 1000 (1866).

M. perakensis Hook. f.: 447 (1887).

M. henricorum Hemsl. in Journ. Linn. Soc. London 26: 442 (1894).

Common, widely distributed Nepal eastwards in the southern Himalaya, to Burma, Andaman Isl., Thailand, S. China, Malaya, Sumatra and Java.

Distinguished from *M. indica* and *M. peltata* by the broadly truncate base, basal secondaries rather straight and tertiaries straight and parallel (ie. scalariform) and pale and clearly visible on the lower leaf surface. Furthermore, the twigs are usually coarsely striate with an ochre-fawn (but caducous) tomentum, the fruits are two-shouldered with very short reflexed stigmas. Rarely the leaf has several big glands on the main basal nerves near the petiole insertion, but they are smaller than similar glands in *M. indica*, which are always 2 in number.

Roth's description of a peltate-leaved plant with entire bracteoles most closely fits here rather than with *M. indica* where J. D. Hooker thought it might belong. If a specimen can ever be traced the epithet is four years earlier.

Macaranga digyna (Wight) Muell. Arg.: 1007 (1866); Hook. f.: 453 (1887); Trimen: 70 (1898); Pax & Hoffm. vii: 323 (1914); Airy Shaw in Kew Bull. 19: 327 (1965).

Claoxylum digynum Wight, Ic. Pl. Ind. Or. 5: 23, t. 1884 (1852).

Rottlera digyna (Wight) Thwaites, Enum. Pl. Zeylan.: 273 (1864).

Mappa digyna (Wight) Muell. Arg. in Linnaea 34: 198 (1865).

Ceylon.

A typical species of section *Pseudo-Rottlera*.

Macaranga gamblei Hook. f.: 445 (1837); Brandis: 592 (1906); Pax & Hoffm.: 364 (1914); Cowan & Cowan: 120 (1929). Airy Shaw in Kew Bull. 19: 327 (1965) *passim*.

Tanarius gamblei (Hook. f.) O. Kuntze, Rev. Gen. Pl.: 620 (1891).

Sikkim at Dalkajhar (type, K!) and Darjeeling (Hans 77, BM!)

Pax & Hoffmann place this species in Sect. *Pseudo-Rottlera*. As Hooker remarked it is highly distinctive. Unfortunately it is still only known from the original gathering (Gamble 503C, 503D, ! at K) now a century old (4 [18] 76) and one more recent gathering (1963). Both are male. The Gestalt is of Sect. *Pseudo-Rottlera* but, as Airy Shaw pointed out, the branched, compound, terminal male inflorescence is very different from anything else in the section. More material is needed.

Macaranga indica Wight, Ic. Pl. Ind. Or. 5:23, t. 1883 (1852) and 6:5 t. 1949, ii (1853); Muell. Arg.: 1009 (1866); Kurz: 397 (1877); Hook. f.: 446 (1887); Trimen: 70 (1898); Brandis: 592 (1906); Pax and Hoffm. vii: 349 (1914); Haines: 108 (1925); Gamble: 1326 (1925); Cowan & Cowan: 121 (1929); Hurusawa and Tanaka in Hara, Fl. E. Himalaya: 179 (1966); Airy Shaw in Kew Bull. 23: 93 (1969), 26: 290 (1971); Whitmore & Airy Shaw in Kew Bull. 25: 241 (1971); Whitmore: 107 (1973).

W. Peninsular India, Ceylon, E. Himalaya, SW. China, Assam, Andaman Isl., Thailand, Malaya.

Very easily confused with *M. peltata*, and sterile specimens cannot be certainly named. *M. indica* usually has 2 large glands on the leaf near the petiole insertion, but not always; such glands are never present in *M. peltata*. Both species have almost terete twigs which may be glaucous to a variable degree, distinctions from *M. denticulata*. The broad papery stipules are soon to very soon caducous. The leaves in both species are deeply peltate with rounded base, and velvety to almost glabrous below. The bracteoles of *M. indica* are essentially spoon-like, linear, with a large apical gland. Those of *M. peltata* are ovate, dentate, rusty tomentose and very conspicuous. In both species the bracteoles are caducous, especially in the female. The male panicles of *M. indica* have slender zig-zag branches, and those

of the female are slightly zig-zag. *M. peltata* has stouter straightish branches. Both species have the style long and eccentric. The fruits of *M. indica* mature at c. 2 mm diam. rarely it is bilobed (but nearly always in the sparse Malayan material at K); the pedicel is 10 mm long; fruits are borne on secondary branches and the panicles are pyramidal and form dense, tangled clusters. In *M. peltata* the mature fruit is c. 4 mm diam. and the pedicel is 20 mm long; fruits are borne on the primary branches, the infructescences are smaller, racemose and roughly oblong, they do not form dense tangles. *M. flexuosa* has the bracteoles of *M. peltata*; it is clearly conspecific with that, not *M. indica* where it has long been placed.

Macaranga kurzii (O. Kuntze) Pax & Hoffm. vii: 360 (1914); Airy Shaw: 290 (1971).

M. membranacea Kurz in Journ. As. Soc. Bengal 42: 246 (1873) & For. Fl. Brit. Burma 2: 389 (1877); Hook. f.: 454 (1887); non Muell. Arg. (1866).

Tanarius kurzii Kuntze, Rev. Gen. Pl.: 619 (1891).

Lower Burma (apparently rare), Thailand, S.W. China, Indochina.

Macaranga nicobarica Balakrishnan and Chakraborty in Gdns' Bull. Sing. 31: 57-60.

Great Nicobar Isl., Katchal Isl., Andamans and possibly Burma at Amherst.

The description suggests that this recently discovered species is related to *M. gigantea* but differs in the entire leaves, the bracteoles entire (♂) or only shallowly irregularly dentate (♀) not deeply dentate, and the leaves below only sparsely pilose and with minutely red — lepidote. Maung Tha Myaing 159 (commun. Lace) at K (!) is very similar but the leaves have two short lateral lobes.

Macaranga peltata (Roxb.) Muell. Arg.: 1010 (1866); Pax & Hoffm. vii: 347 (1914); Gamble: 1326 (1925); Cowan & Cowan: 121 (1929).

M. roxburghii Wight Ic. Pl. Ind. Or. 5: 23 (1852) & 6: t 1949 iv (1853); Hook. f.: 448 (1887); Brandis: 592 (1906); Haines: 108 (1925).

M. tomentosa Wight, Ic. Pl. Ind. Or. 5: 23 (1852) & 6: 1949, i (1853). Muell. Arg.: 1010 (1866); Trimen: 70 (1898).

M. flexuosa Wight, Ic. Ind. Or. 5: 23 (1852) & 6: t. 1949, iii (1853); Gamble: 1326 (1925) **Syn. nov.**

M. wightiana Baill., Ét. Gén. Euphorb.: 432 (1858).

Mappa peltata (Roxb.) Wight, Ic. Pl. Ind. Or. 3: t. 817 (1844).

Osyris ? *peltata* Roxb., Fl. Ind. ed. 2, 3: 755 (1832).

India from Sikkim southwards, Ceylon, Andaman Isl., Tenasserim.

Extremely easily confused with *M. indica*, q.v. for a full discussion.

Macaranga pustulata King ex Hook. f.: 445 (1887); Pax & Hoffm. vii: 338 (1914); Brandis: 592 (1906); Cowan & Cowan: 120 (1929); Hurusawa & Tanaka in Hara, Fl. E. Himalaya: 179 (1966).

Tanarius pustulatus (King ex Hook. f.) O. Kuntze, Rev. Gen. Pl.: 619 (1891).

M. gmelinifolia King ex Hook. f.: 445 (1887); Brandis: 592 (1906); Cowan & Cowan: 120 (1929). **Syn. nov.**

Himalaya from Kumaon eastwards, 3-6000 ft., chiefly on old clearings, often gregarious.

Macaranga quadricornis Ridley in Bull. Misc. Inf. Kew 1923: 367 (1923) & Fl. Mal. Penins. 3: 300 (1924); Whitmore in Biol. Journ. Linn. Soc. 1: 227-230 (1969) & Tree Flora Malaya 2: 107 (1973) &: 149 (1975); Airy Shaw: 291 (1971) '*M. ? tenuifolia*' sec. Corner: 269 (1940), *an* Muell Arg.?

M. triloba sec. Airy Shaw: 292 (1971) in annot. 'Lower Burma' *an* (Bl.) Muell. Arg.

Lower Burma, Thailand, Malaya, Borneo.

Macaranga tanarius (L.) Muell. Arg.: 997 (1866); Kurz; 388 (1877); Hook, f.: 447 (1887); Brandis: 592 (1906); Pax and Hoffm. vii: 352 (1914) (excl. synonym. *M. clavata* Warb.); Whitmore in Malayan Nature Journ. 20: 94, 99 (1967), 111 (1973) and: 158 (1975); Airy Shaw in Kew Bull. 23: 999 (1969), in clavi & 26: 291 (1971).

Ricinus tanarius L. in Stickm. Herb. Amboin.: 14 (1754) and in Amoen, Acad. 4: 125 (1759).

Mappa tanarius (L.) Bl., Bijdr.: 624 (1825).

M. tomentosa Bl., Bijdr.: 624 (1825).

Macaranga molliuscula Kurz in Journ. As. Soc. Bengal 42: 245 (1873).

Lower Burma, Andaman Isl., Nicobar Isl., S. E. and Lower Thailand, Cochinchina, S. China, Taiwan, Ryu Kyu Isl., throughout Malesia to N. Australia and Melanesia.

Macaranga trichocarpa (Reichb. f. & Zoll.) Muell. Arg.: 1003 (1866); Hook. f.: 450 (1887); Pax & Hoffm. vii: 358 (1914); Whitmore in Malayan Nature Journ. 20: 95, 99 (1967), Tree Flora Malaya 2: 112 (1973) &: 158 (1975); Airy Shaw in Kew Bull. 23: 97 (1969), 26 *q.v* for full synonymy, 26: 292 (1971).

Mappa trichocarpa Reichb. f. & Zoll. ex Zoll. in Verhand. Naturk. Vereen. Ned. Ind. 1: 8 (1856), & in Linnaea 28: 307 (1856).

Macaranga minutiflora Muell. Arg. in Flora 47: 466 (1864) & in DC.: 1012 (1866); Pax & Hoffm. vii: 358 (1914); Pax apud Schmidt in Bot. Tidsskr. 32: 390 (1916). Brandis: 592 (1906). Kurz: 388 (1877).

M. helferi Muell. Arg.: 1004 (1866).

Lower Burma, ? Andaman Isl. (Helfer 4750, K !), Thailand, Indochina, Malaya, Sumatra, Borneo.

Doubtful and excluded species

Macaranga depressa (Muell. Arg.) Muell. Arg.: 989 (1866); Hook. f.: 454 (1887); Trimen: 71 (1893); Whitmore: 146 (1975).

This is recorded for Ceylon by Muell. Arg. on the basis of specimen of Thunberg's in Herb. Upsala. The species is a Bornean endemic and I agree with Trimen that there must be an error of labelling.

Macaranga involucrata (Roxb.) Baillon, Ét. Gén. Euphorb.: 432 (1858). Muell. Arg.: 1011 ex parte Pax & Hoffm.; Hook. f.: 454 (1887); Pax & Hoffm. vii: 374 (1914).

Urtica involucrata Roxb., Hort. Beng.: 67 (1814).

Moluccas. Cult. in Calcutta Botanic Garden (Wallich 4621).

Macaranga sp. Hook. f.: 454 (1887) 'Chittagong, (Hook. f. & C. T. Clarke)'. This collection is not represented at BM or K.