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THE GENUS MASTIXIA BL. (CORNACEAE) IN CEYLON

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ABSTRACT

Five species of *Mastixia* are found in Sri Lanka, of which *M. congylos* and *M. nimalii* are here described for the first time, whereas *M. tetrandra* var. *thwaitesii* is raised to specific rank as *M. montana. M. arborea* does not occur in Sri Lanka. A key to the species is presented and the specimens examined are enumerated.

ABSTRAK

Lima jenis *Mastixia-* terdapat di Sri Lanka. Dua jenis baru *M. congylos* dan *M. nimalii* dipertelakan untuk pertama kali, sedangkan *M. tetrandra* var. *thwaitesii* dinaikkan tingkatnya menjadi jenis *M. montana. M. arborea* tidak terdapat di Sri Lanka. Kunci determinan dan spesimen yang diperiksa disensus.

INTRODUCTION

The genus *Mastixia* Bl. was created in 1825 by Blume and based on two Javanese species. In Ceylon the genus and its two species were described by Thwaites under the generic name *Bursinopetalum* Wight, originally in 1855 in Araliaceae, later in 1858 referred by him to the tribe Icacineae of Olacaceae. It was Baillon who reduced in 1863 *Bursinopetalum* to *Mastixia,* which was accepted by Bentham & Hooker, whereas Clarke in 1879 relegated the Indian and Ceylonese *Bursinopetalum* .species to *Mastixia.* They were described under *Mastixia* by Trimen in his Flora of Ceylon. No new species had been added since Thwaites, *B. tetrandrum* var. b Thwaites had been given the varietal name *thwaitesii* by Clarke,

Wangerin in an excellent revision of the genus presented **in 1910,** mentioned *M. tetrandra* var. *thwaitesii,* but *M. arborea* var. *macro-*

phylla Thw. is not mentioned. Danser *(in* Blumea 1: 56. 1934) treated the Ceylonese *M. tetrandra,* but omitted by mistake the basionym and mentioned only the nomen nudum *Bursinopetalum tetrandnim* Teijsm. & Binnend., Cat. Hort. Bogor. 109. 1866. According to the description, the Sumatran material of *M. tetrandra* is different from *M. tetrandra* of Ceylon. This is also Matthew's (1977) opinion.

It is amazing, that neither Wangerin, nor Danser, nor Trimen (Wangerin mentioned the double tip, Trimen only the inflexed tip) described fully the remarkable cucullate apex of the petal with the double tip bent at right angles inward and the minute again inflexed terminal tip, well described and depicted by Wight for his *Bursinopetalum arboreum,* and also less completely by Matthew. The intricate structure of these tips can be observed in a late stage of the bud, by removing the strongly coherent petals and observing them from the inside.

Wangerin pointed out the most important characters to distinguish the species: 1. the 4- or 5-merous flowers (in some extra-Ceylonese species this character does not seem to be constant, as in some inflorescence both kinds may be found); 2. the difference in size of the sepal lobes, they are either well developed, but as a rule much broader than high, but in some species they are lacking and only indicated by a sharp tip; 3. the phyllotaxis of the leaves, in the Ceylon species this is always a spiral, opposite leaves (except the 2 apical ones) do not occur.

Danser did not add anything new to this, but considered also the dimensions of twigs and leaves as a useful distinctive character; for the leaves I agree, for the size of the branchlets not, because of the enormous variation in diameter on the same tree.

Contrary to Danser, I believe that the flowers are sessile, and subtended at the base by a bract; each very short branchlet ends in one flower, of the other two flowers only the bracts are present. What Danser considered an articulate pedicel, is the ultimate branchlet, not different in shape from the other branches. Matthew came to the same conclusion.

Matthew's treatment in 1977 is not convincing and unacceptable. Instead of adhering to the two subgenera *Pentamastixia* and *Tetramastixia* of Wangerin which admittedly are not entirely foolproof, as already stated by him and Danser, as in some inflorescences up to 20 per cent of the flowers may have a different number of sepal lobes, petals and stamens than the other 80 per cent (Matthew), he chose an extremely weak and unreliable character to establish two series *Oppositae* and *Altenae,*

based on a single character: whether the first branches (and only these) of the inflorescence are opposite (or sub-opposite) or alternate.

A priori this character is to be considered as unreliable in a genus, where opposite, subopposite and .spirally arranged leaves and inflorescence branches are found, and how one can distinguish between sub-opposite and alternate, is beyond my intelligence. If *Pentamastixia,* and *Tetramastixia* are considered by him to be artificial, his own two series are even much more artificial.

Observing numerous inflorescences, when collecting, I found in all 5 species of Ceylonese *Mastixia* sub-opposite, opposite and alternate lower inflorescence branches, which was predictable. The main base of classification being wrong, Matthew lumped many heterogeneous elements under the same species and it is hence not amazing that he finds such a hodgepodge of penta — and tetramerous varieties under his "species".

His reasoning that the geographic distribution fits his series, is putting the argumentation upside down. In a restricted area, like Ceylon, 2 pentamerous and 3 tetramerous species are found, which are easily distinguishable in other respects.

Furthermore it should not be forgotten, that all 5 Ceylonese species are liable to heavy gall forming (witches brooms of the inflorescence), which is a ready source for changes in the number of flower parts. In two trees of *M. tetrandra,* not too far apart in the Sinharaja forest, one had all healthy inflorescences and in 100 flowers dissected, all proved to be tetramerous. The other tree had witches-brooms and here practically all flowers were abnormal with 3, 4, 5 or 6 flower parts.

A complete overhaul of Matthew's species concepts is necessary. Danser wisely abstained from introducing a new classification, as there was,none. The creation of the subgenus *Manglesia* seems to be warranted, but only on the basis of the two whorls of 4 stamens and perhaps the swollen septa of the fruit, the other characters, mentioned by Matthew, occur in *Mastixia* proper, a truncate calyx in *M. congylos* and 4-angular inflorescence branches in *M. macrophylla.*

The size and shape of the fruit is extremely variable in the same tree, and should be handled with great care, even the shape of the disc in the fruit may differ from completely sunk in the calyx tube to completely protruding.

Likewise the colour of the dried leaves can only be used for normally shed leaves, the mode of artificial drying makes it as a rule impossible to draw any conclusions in herbarium material. In Ceylon *M. tetrandra* has brown, fallen leaves, in the other species the fallen leaves are black.

A much more reliable character is the nature (not the density) of the indumentum. It proved to be constant in Ceylonese species.

The name *Mastixia* refers to the whiplike apex of the petals; *Bur-8inopetalum* refers to the thick, leathery petals.

MASTIXIA Bl.

Mastixia Blume, Bijdr. PI. Neerl. Indie 13: 654. 1825; Mus. Bot. Lugd. bat, 1: 256. 1850; DC, Prodr. 4: 275. 1830; Miquel, PI. Ind. bat. 1(1): 771. 1856; Benth. & Hook., Gen. PI. 1: 950. 1887; Baillon, Hist. PL 7: 255. 1879; Clarke *in* Hooker f., Fl. Brit. Ind. . 2: 745. 1879; Trimen, Handb. PI. Ceylon 2: 286. 1894; Harms *in* Engl. & Pr., Nat. Pfl. fam. 3(8): 263. 1898; Wangerin *in* Engl. Pfl. reich 4(229): 19. 1910; Ridley, PL Mai. Pen. 1: 889'. 1922; Danser *in* Blumea 1: 47. 1934; Backer & Bakh., Fl. Java 2: 159. 1959; Matthew *in* Blumea 23): 51-93. 1977.

Mastixia, Spach, Hist. nat. Veget. Phaner. 8: 88. 1839.

Bursinopetalum Wight, Icon. 3(3): 4. 1847; Spicil. Neilgher. 1: 22. 1847; Walp. Ann. 1: 124. 1848; Thwaites in Hook. J. of Bot. & Kew Miscell. 7: 242, 1855; Enum. PI. Zeyl. 42. 1864; Seemann in J. of Bot. 2: 205. 1864; Wangerin, I.e. 19; Danser, I.e.; Matthew, I.e. 61.

Lecto type species: *Mastixia pentandra-* BL (Hutehinson, Gen. fl. PI. 2: 45. 1967).

Large trees, usually without buttresses; bark smooth or rough; live bark thick, juicy, soft, granular, usually pale yellow. Wood yellowish white or white, soft. Leaves spirally arranged (Ceylon species), usually long-petioled; upper surface with impressed midrib and also as a rule the thin, lateral nerves impressed; secondary nerves parallel and horizontal, usually clear on the lower surface; the leaves usually drying black, rarely brown *(M. tetrandra).* Flowers in triads, sessile, subtended by tiny, persistent bracts, forming a corymbiform, pseudoterminal or axillary short and rather few-flowered panicle with long thickish peduncle and short stiff, erect-patent apical branches. The greater part of the calyx tube adnate to the ovary, conical or barrel-shaped, the small apical part flaring out, cup shaped, bearing 4 or 5 short lobes, broader than long or sometimes the lobes only indicated by a sharp tip. Petals valvate in bud, strongly coherent apically, much longer than the calyx lobes, 4 or 5, concave, fleshy, the tips cucullate and the utmost part bent inwards at 90 degrees, consisting of two concave parts, their backs pressed together, ending in a very short tip, again at an angle of 90 degrees. Disc large, a cylinder-segment, usually grooved above. Stamens 4 or 5, opposite the calyx lobes, anthers large, introrse -latrose, filaments short, broad at base, tapered to the versatile anther, the stamens attached below the disc. Ovary 1-locular with one ovule, pendulous from the apex. Style very short, conical, ribbed, with truncate, inconspicuous stigma. Fruit ellipsoid, smooth, the apex showing the disc and style remnant, surrounded by the thin, adpressed, often rather irregular rim

of the calyx tube. Putamen lignose, sulcate at the outside, a vertical lamelliform processus of the endocarp intruding. Seed filling the locule completely with membranous testa, fleshy, large endosperm and small embryo; cotyledons thin, foliaceous, radicle long, cylindrical.

DISTRIBUTION: India, Ceylon, the former Indochina, Malesia up to New Guinea.

KEY TO THE CEYLONESE SPECIES

1a. Flowers 5-merous 2
b Flowers 4-merous 3
2a. Flowers glabrous or nearly so. Petals yellow to greenish yellow, 4—5 mm long-. Calyx lobes distinct . . . . . 1. *M. macrophylla*
b. Flowers densely pubescent. Petals green, 2 mm long. Calyx lobes hardly visible . . . . . 2. *M. congylofi*
3a. Panicle and flowers densely pubescent. Leaves chartaceous to subcoriaceous, long-acuminate, drying brown . . . . . 4. *M. tetrandra*
b. Panicles and flowers glabrous. Leaves coriaceous to rigidly coriaceous, obtuse or very shortly acuminate, drying black 4
4a. Leaves elongate obovate to obovate-spathulate. Petiole 1%—4 cm long. Fruit 1.5 x 3 cm. Lowland tree . . . . . 3. *M. nimalii*
b. Leaves narrowly oblanceolate to oblanceolate. Petiole %—1 cm long. Fruit 1 X 2 cm. Mountain tree . . . . . 5. *M. montana*

1. MASTIXIA MACROPHYLLA (Thw.) Kosterm.

Mastixia macrophylla (Thw.) Kostermans *in* Ceyion J. Sci. (Biol. Sci.) 12(2) : 129. Nov. 1977. — *Bursinopetalum macrophyllum* Thwaites, Enum. PI. Zeyl. 42. 1858. — *Bursinopetalum arboreum* var. *macrophyllum* Thwaites, I.e. — *Mastixia arborea* ssp. *macrophylla* (Thw.) Matthew *in* Blumea 23: 90, f. 4. 1977. — Lectotypus: *C.P. 637* (BM) (Matthew, I.e.); syntypus: *C.P. 2440* (PDA).

Mastixia arborea, (Wight ex Thw.) Clarke *in* Hooker f., Fl. Brit. Ind. 2: 745. 179, p.p., quoad cit. Ceylon; Trimen, Catal. 40. 1885 & Handb. Fl. Ceylon 2: 287. 1894 (exclud. cit. Wight Clarke); Wangerin *in* Engl., Pflanzen, reich 4(229): 27. 1910, p.p., quoad Ceylon.

Bursinopetalum gardnerianum, Baillon *in* Adansonia 3: 83. 1862 (in adnot.); Wangerin, I.e. 27; Matthew, I.e. 87. — *Mastixia Gardneriana* Baillon *in* Adansonia; 3: 83. 1862; Wangerin, I.e. 27; Matthew, I.e. 87 — Typus: *Thwaites C.P. 637* (P).

Mastixia thwaitesii Baillon, I.e. (in adnot,); Wangerin, I.e. (sub *M. arborea)* ; Matthew, I.e. — Typus: Thwaites C.P. 2440 (P).

Tree up to 20 m tall and 40 cm diam. breast high. Branches rather scarce, horizontal. Bark smooth, light greyish brown, sometimes fissured, the strips 1 cm wide, 2 mm thick and peeling off. Live bark up to 10 mm thick, soft, granular, yellowish white. Wood white, to yellowish white, soft. Branchlets thick, smooth, with large leaf scars. Leaves aggregate at the ends of the branchlets, stiffly coriaceous, glabrous, obovate-

Elliptic, rarely elliptic or oblanceolate, (3 x 5)—6 x 11—9 x 14—13 X 21 cm, rounded and usually very shortly and broadly (5—10 mm) acuminate, base cuneate, both sides in sicco wrinkled, above the slender midrib and thin lateral nerves slightly impressed, the venation faint; below paler, midrib prominent, the rather patent, slender, c. 6 pairs of lateral nerves slender, prominulous, near the margin arcuate; secondary nerves almost horizontal, thin; in between a lax thin raticulation. Petiole stout, broad (3—4 mm apically), 21/2—4 cm long, above flat and thinly ribbed.

Panicles corymbiform, pseudo-terminal or axillary, glabrous, or the ultimate branches and flowers minutely, laxly adpressed pilose, 5—12 cm long, stiff, lax; main peduncle stout, long, the branches rather erect, up to 6 cm long. The ultimate branches very short, bearing one or two sessile flowers, subtended by triangular, acute, pilose or glabrous, 1—2 mm long bracts. Calyx glabrous or slightly pilose, broadly obconical, c. 2 mm high, flaring into a c. 1 mm high free part with 5 very broad, acute, c. 1 mm high lobes. Petals 5, yellow to greenish yellow, fleshy, glabrous or sub-pilo,se, ovate, acute, 4—5 mm long, concave, explanate, the tips cucullate, then bent inwards at right angles (this part consists of tw7o concave parts, concave outside) and a finally bent very short tip. Disc large, c. 1 mm high. Stamens 5. Style 2 mm, obconical; stigma inconspicuous, capitellate-peltate, obscurely 5-lobed. Fruit ellipsoid, black, smooth, 2 x 3—21/2 X 4 cm.

DISTRIBUTION: Mountain forests in the S. parts of Adam's Peak Jungle, at 700—1700 m alt.

The name *Bursinopetalum macrophyllum* was published by Thwaites as an alternative name of *B. arboreum* var. *macrophyllum* Thw. As the alternative name was published before 1953 (Article 34 of the Code), it is validly published. Of the 2 specimens enumerated by Thwaites, I have not seen *C.P. 637.* Neither Wangerin nor Matthew mentioned *Bursinopetalum macrophyllum* Thw. Trimen, I.e. 287, does not even mention Thwaites's names, but merely states that *C.P. 2UU0* has large petioles and a broader fruit.

The leaves of this species are larger than any other kind in Ceylon and are moreover very rigidly coriaceous. Wight gives the dimensions of the leaves of *B. arboreum* as 2—3 X $1^{1}/^{\wedge}$ inch and they are shorter than the panicles, quite different from *M. macrophylla.*

M. macrophylla is easily distinguishable from the other species of Ceylonese *Mostixia* by the large, very thick leaves, the long petioles, the large fruit and especially by the exceptionally large, yellow flowers.

In some cases the top of the fruit (disc) protrudes for 5 mm, but as a rule the calyx rim reaches practically the top.

Adam's Peak Jungle, above Moray Estate, Maskeliya area, alt. 1700 m, Jan. fl., *Kostermans 27237* (G, L, PDA); near Fishing Hut, alt. 1500 m, Nov., fl., fr., *Kostermans 27053 & 27065* (G, L, PDA); May, fr., *Kostermans 24134* (G, K, L, PDA, US); trail to Adam's Peak, y. fr., *Sumithraafachchi 183* (PDA); Dam site along Maskeliya R., alt. 1200 m, y. fr., *Kostermans 24104,* (G, K, L, PDA, US); Norton Bridge-Maskeliya road, May, fr., *Worthington 2721* (K); Doublecutting, road to Maskeliya, alt. 900 m, May, y. fr., *Kostermans 24091* (K, L, PDA, US); Eakwana, Illumbe Kande, alt. 1100 m, March, fr., *Worthington 3631* (K); Banbarabotuwa For. Res., between Pelmadulla & Rassagalle, alt. 740 m, Oct., fr., *Huber 500* (PDA); Tumbagoda above Rassegalle, path to Moray Estate, alt. 800—1200 m, June, fr., *Kostermans 24475* (K, L, PDA, US); ibid., Apr., fr., *Kostermans 24649* (K, L, PDA, US); Ambagamuwa, March, fl., *Ferguson s.n.* (PDA); locality unknown, y.fr., *C.P. 2440* (PDA); Nuwara Eliya, fr., *Gardner 100* in Herb. Wight (PDA).

2. Mastixia congylos Kosterm., *spec. nov.*

Mastixia tetrandra var. *tetrandra,* Matthews *in* Blumea 23: 78. 1977, p.p., quoad *Balasubramaniam 986* (L).

Arbor magna, ramulis sparse minutissime pilosis, foliis alternantibus subcoriaceis glabris obovato-oblongis vel oblongis vel oblanceolat-oblongis breviter et abrupte acuminatis basi acutis, supra nervo mediano impresso costis tenuibus prominulis (parte basalibus impressis) rete obscuris, subtus pallidioribus, nervo mediano valde prominentibus costis tenuibus prominulis sat patentibus, rete laxis obscuris, petiolis tenuibus glabrescentibus supra concavis, paniculis corymbiformibus sat pauci-floris pseudoterminalibus, floribus versus dense minutissime subad-presse pilosis, bracteis minutis persistentibus, floribus sessilibus, calyx obconicis, parte apicalibus cupuliformibus, lobis 5 inconspicuis, petalis 5 concavis dense pilosis, minute cucullatis, staminibus 5, filamentis latis attenuatis, discus magnis cylindricis supra radiato-sulcatis, stylo crassis breviter costatis, apice truncatis.

TYPUS: *Kostermans 25190* (L).

Tree, up to 35 m tall and 70 cm dbh. with rather smooth, pale greyish brown, 1 mm thick bark. Bole 10 m high, slightly fluted up to 4 m, the flutes merging into 1—2 m high buttresses, 50—100 cm out; live bark 10 mm, yellowish, granular, rather soft, juicy. Branchlets apically minutely sub-adpres,sed pubescent. Leaves spirally arranged, sub-coriaceous, obovate-oblong to oblong or oblanceolate-oblong, 2 x 5—21,4 x 3—8 cm, abruptly, very shortly (3—5 mm) acuminate, base acute; above midrib slightly impressed, the lateral nerves very thin, mostly (except the basal ones) prominulous, reticulation obscure; below paler, midrib strongly prominent, the 8—10 pairs of thin, lateral nerves rather patent, reticulation lax, obscure. Petiole slender, concave above, 5—13 mm long.

Panicles corymbiform, pseudo-terminal, rather few-flowered, up to 4 cm long (sub-mature), main peduncle long, stiff, rather thick, up to 2 cm, bearing a few very short branches, towards the sessile flowers densely grey puberulous with thin, rather woolly hairs. Bracts minute, persistent. Calyx obconical, flaring into a short, much wider apical part, the 5 lobes indistinct, acute. Petals 5, sub-orbicular, c. 2 mm long (sub-mature), fleshy, concave, in bud strongly cohering at the cucullate tips; stamens 5 with broad, short, apically tapered filaments and large elliptic anthers. Disc cylindrical, c. 3/4 mm high, the upper surface deeply, radially sulcate. Style short, conical, 5-ribbed, top truncate.

DISTRIBUTION: N.W. part of Knuckles Mts., Madulkelle area, at c. 600—800 m alt. Wet, but with long dry season.

The species differs from all other Ceylonese ones by its large buttresses. With its 5-merous flowers it is near *M. macrophylla,* but is has the indumentum of *M. tetrandra.* The material available (twice collected from the same tree) was in bud. At this stage the petals strongly adhere at their tips and from the inside, the small cucullate parts seem to be fused. The specimen *Balasubramaniam 986* was collected from the same tree.

Named after the Knuckles Mts. (knuckles = congylos).

Knuckles Mts., Madulkelle area, cardamum estate of Dr. Pereira, reached via Lebanon Estate, alt. c. 800 m, at the foot of Dusingalle, June, buds., *Kostermans 25190 (= 25055)* (BO, G, K, L, PDA, US).

3. Mastixia nimalii Kosterm., *spec. nov.*

Arbor magna, ramulis glabris, foliis glabris, coriaceis obovato-spathulatis apice rotundatis vel rotundatis et apiculatis, basin versus sensim attenuatis, supra laevibus nervo mediano et parte basalibus costis lateralibus impressis, subtus pollidioribus, nervo mediano prominentibus, nervis lateralibus paucis tenuibus prominulis, nervis secundariis sat obscuris horizontalibus, petiolis longis, paniculis corymbiformibus glabris paucifloris, floribus sessilibus parvis glabris vel sparse minutissime pilosis, calyx conspicuis, lobis calycibus 4 parvis, petalis 4 subovato-oblongis apice cucullatis appendiculatis, staminibus 4, stylo crasso brevibus, fructus laevibus ellipsoideus, parte apicalibus discus epigynus conspicuis appianates.

TYPUS: *Kostermans 27883* (L).

Tree, up to 25 m tall and 50—65 cm in diam., glabrous in all its parts, no buttresses; lower part of bole (c. 4 m in larger trees) with very conspicuous longitudinal rows of interrupted ridges, 5 mm wide, lighter on their central upper surface (lenticels!). Bark c. 1 mm thick,

light grey brown; live bark soft, juicy, granular, pale whitish yellow, 10 mm thick. Branchlets grey with large round leaf scars. Leaves aggregate, coriaceous, elongate obovate to obovate-spathulate, 3 1/2 X 6—4 1/2 X 10—5 x 12 cm, rounded or rounded and shortly broadly apiculate, towards the base tapered, acute; above smooth, the thin midrib and the basal part of the thin lateral nerves impressed; below paler, midrib prominent, lateral nerves thin, prominulous, erect-patent, 4—7 pairs, towards the margin arcuate, connected by faint horizontal secondary nerves, which have in between a lax obscure reticulation. Petioles slender, 1 1/2—4 cm long, flat above (apically slightly channeled).

Panicles axillary, few-flowered, corymbiform, up to 5 cm long; main peduncle thickish, up to 3 cm, bearing a few erect-patent branches, which are twice branched, the branches extremely short, subtended by 2 mm long, narrow, acute bracts. Each bract (1 mm long) with one flower. Flowers sessile. Calyx obconical or barrel-shaped, 2 mm high, flaring into a much wider, free part, c. 1 mm high, bearing the minute, broader than long, c. 1 mm high, acute, 4 lobes. Petals 4, fleshy, ovate-oblong to oblong, concave, 2 1/2 mm long, with small cucullate and appendaged apex, bent inwards at right angles; stamens 4, filaments thickish, tapered, 1 1/2mm long, anthers large,1 1/2 mm long. Disc cylindrical, large, 3/4 mm high, not incised. Style thick, sub-conical, 3/4 mm long with sub-globose, small stigma.

Fruit ellipsoid, up to 15 X 30 mm, smooth, bracts persistent at their base, apex oblique with slightly sunk, up to 7 mm diam., flat disc and style base.

DISTRIBUTION: S.W. Ceylon, Sinharaja forest, wet evergreen.

The 4-merous flowers are characteristic for both *M. tetrandra* and *M. nimalii*, but the latter has coriaceous obtuse leaves, drying black, glabrous flowers and a very characteristic bark in the lower part of the bole.

The species is named in honour of Dr. I.A.U. Nimal Gunatilleke, lecturer at the Peradeniya University who, with his wife, Dr. Savitri Gunatilleke-Peeris, have been involved in plant sociological and ecological work in the Sinharaja forest and they were the first to point out, that this is a species quite distinct from *M. tetrandra* with a distinct Sinhalese name diya (= water) taleya, a name sometimes also used for *M. tetrandra.*

S.W. Ceylon, Sinharaja forest, Weddagale entrance, wet, evergreen alt. 200 m, scattered, 5 Oct. buds, *Kostermans 27836* (G, L, AARH, PDA); same tree 19 **Oct.,** buds *Kostermans 27883* (id.); July, fr., *Kostermans 26648* (P, R, PDA); Sinhagalle, Mar., buds, *Gunatilleke B. 3389* (PDA); S. side of Sinharaja forest between Opanaka and Wewalwatte, Oct. fr., *Nooteboom 3301* (L, **PDA).**

4. MASTIXIA TETRANDRA (Wight ex Thw.) Clarke

Mastixia tetrandra (Wight ex Thw.) Clarke *in* Hooker f., Fl. Brit. Ind. 2: 745. 1879 (exclud. var. *thwaitesii* Clarke); Trimen, Catal. 40. 1885 and Handb. Fl. Ceylon 2: 287. pi. 47. 1894 (exclud. var *thwaitesii)* Wangerin *in* Engl. Pflanzenreich 4, 229; 21. 1910 (exclud. var *thwaitesii;* Danser *in* Blumea 1: 56, 1934 (quoad nomen and quoad cit. Ceylon, ceter, exclud.). — *Bursinopetalum tetrandrum* Wight ex Thwaites, Enum. PI. Zeyl. 42, 1858 (exclud. var. 6). — Typus: *C.P. 2U1* (PDA).

Mastixia lanceolata Baillon *in* Adansonia 3:: 88. 1862 (in adnot.) — Typus: *Thwaites C.P. 2441* (P).

Tree, up to 25 m tall and up to 100 cm in diam., no buttresses. Bark smooth, pale brown, thin, at base with lenticels, live bark 3—5 mm thick, pale orange yellow. Branchlets rather slender, rather densely microscopically adpressed pubescent. Leaves chartaceous to sub-coriaceous, oblanceolate to oblong-oblanceolate, 2 x 5 — 2—31/2 x 6 — 5 X 11 cm, acuminate to abruptly subcaudate-acuminate (acumen 10—15 mm long), base tapered, acute; above smooth, midrib and the thin lateral nerves slightly impressed, below sparsely, microscopically pilose, glabrescent, midrib prominent, lateral nerves thin, prominulous, c. 6 pairs, rather arcuately ascendent, reticulation lax, obscure, the horizontal secondary nerves not visible. Petioles thin, 1—2 cm long, glabrescent, concave above.

Panicles pseudo-terminal, densely grey pubescent, rather few flowered, up to 4 cm long, bracts minute, persistent. Flowers sessile, calyx tube obconical, 1 mm high; lobes 4, triangular, acute, 1/2 mm high, thickish, broader than long. Petals 4, ovate, acute, concave, slightly cucullate, 21/2 mm long. Stamens 4 on short filaments.

Fruit ellipsoid, smooth, 12 x 20 — 13 X 25 mm, at the apex with a flat disc, 3 mm in diam. Leaves drying light brown.

DISTRIBUTION: S.W. Ceylon, Sinharaja forest, also Gilimale forest near Ratnapura and Hiniduma. Rather common but very scattered. Doubtful in S. India.

Our description differs somewhat from that of Clarke: the bracts are persistent, the underside of the leaves is pubescent and there are constantly 4 calyx lobes, 4 petals and 4 stamens. The fallen leaves are light brown, not green as Clarke says and in this sense differ from the black leaves of *M. nimalii, M. montana* and *M. macrophylla.*

The petal tips are distinctly cucullate.

Eatnapura District, Kukulane Vihara Kande, Fehr., buds, *Waas 265* (PDA); Walankande, 800 m, May, diseased flowers (witches broom), *Waas 1561* (PDA); Sinharaja, Horagulkande, alt. 300 m. Febr., bads, *Waas 9.015* (PDA); Morakale, Sinharaja, alt. 200 m, Febr., y. fr., *Waas 2067* (PDA); Galle Distr., Hinidumkande, alt. 200 m. July, fr., *Meÿer 578 & Waas 1356* (PDA) ; Kanneliya forest, April, y. fr., *Waas & al. 546* (PDA); Ambagamuwa, March 1883, buds, *W. Ferguson s.n.* (PDA);

Agalawatte, Pasdun Korale, Dec. 1893, fl., sine coll. (PDA); Morapitiya, Kalutara Distr., alt. low, April, fr., *Kostermans 24675* (K, L, PDA, US).

5. Mastixia montana Kosterm., *spec. nov.*

Bursinopetalum tetrandrum var. 6. Thwaites, Enum. PI. Zeyl. 42. 1858 — *Mastixia tetrandra* var. *thwaitesii* C.B. Clarke *in* Hooker f., Fl. Brit. Ind. 2: 745. 1879; Trimen, Handb. Fl. Ceylon 2: 287. 1894; Alston *in* id. 6 (Suppl.): 139. 1931; Lewis, Catal. Trees & flow. PI. W. & Sabaragamuwa Prov. 95. 1902; Wangerin *in* Engl. Pflanzen reich 4, 229: 21. 1910. — Typus: *C.P. 2542,* Maturata, Sept. 1857, buds (PDA).

Arbor mediocris in omnibus partibus glabris, foliis alternantibus rigide coriaceis anguste oblanceolatis vel oblanceolato-oblongis, obtusis vel breviter acuminatis, basi in petiolum sat brevibus decurrentibus, supra nervo mediano costisque et reticulatio impressis, subtus nervo mediano valde prominentibus, costis tenuibus arcuato adscendentibus, margine incurvis, paniculis pseudo terminalibus parvis paucifloris, floribus sessilibus, tubo calycinus obconicis, lobis latis obtusis, petalis 4, ovato-oblongis, staminibus 4, fructus sat parvis ellipsoideus laevibus.

TYPUS: *C.P. 2542* (PDA)

Tree up to 15 m tall and dbh. 60 cm, glabrous in all its parts. Bark smooth, soft, white, 1 mm thick; live bark pale orange yellow. Wood white, soft. Leaves sub-coriaceous to rigidly coriaceous, narrowly oblanceolate to oblanceolate- oblong, 1 x 3—21/2 X 6—1 x 5 cm, obtuse or acuminate (acumen c. 5 mm long), base tapered and slightly decurrent into the petiole; above smooth, the midrib, lateral nerves and reticulation slightly impressed; below midrib strongly prominent, the thin, 4—6 (-9) pairs of lateral nerves rather arcuately ascendent, prorninulous, reticulation lax, obscure; margins revolute. Petioles thin, 5—10 mm long, concave above.

Panicles pseudo-terminal, few-flowered, stiff, initially with few hairs, 2—4 cm long with long peduncle and few short branches, corymbiform, bracts minute, persistent. Flowers sessile; calyx obconical. 1—11/2 mm high, flaring into four, 1 mm high, obtuse, broader than long lobes. Petals 4, with few microscopical adpressed hairs or glabrous, oblong, 2—2 1/2 mm long, slightly cucullate. Stamens 4. Style short, conical.

Fruit ellipsoid, 1 x 2 cm, with apically ribbed disc, 5 mm in diam. and style remnant.

DISTRIBUTION: Only known from Maturata and Hakgalle, a mountain species.

Thwaites considered this a variety of *Bursinopetalum tetrandrum* and did not bother to give it a varietal name. Clarke coined the name

var. *thwaitesii* for it and remarked that it was quite different from *Mastixia tetrandra*, but as Thwaites had accepted it as a variety, Clarke followed suit. Also Trimen pointed to the different aspects of this variety.

Since more material has now become available, it is clear, that this tree deserves specific status; it not only differs in the size, shape and consistency of the leaves, but also the impressed venation on the upper surface is very striking. Moreover the flowers are practically glabrous, the calyx lobes have a different shape and the fruit is much smaller.

Wood soft, perhaps good for tea boxes (Lewis). Lewis' remark (I.e. 96) that the panicles can be very long, apparently refers to witches brooms.

Nuwara Eliya Distr., Hakgalie jungle behind the Botanical Garden, alt. 1500 m, **May,** fr., *Kostermans HI 87* (BO, K, L, **PDA,** US); ibid., 1900 m, Aug., fl., *Theobald* & *Grape 2398* (PDA); Maturata, Sept. 1857, fl., *C.P. 25 U2* (PDA); Watawala, March, ster., *Lewis s.n.* **(PDA).**

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