

## ***Stemonoporus* Thw. (*Dipterocarpaceae*) : a monograph**

(part 2)

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**Summary :** The first part of this revision, concerning 13 species, has been published in this review (*Bulletin du Muséum, Adansonia* 3 (3) : 321-358, 1982). 13 other species, including 3 new ones, are described and illustrated in the present paper.

**Résumé :** La première partie de cette révision (traitant de 13 espèces) a été publiée dans le *Bulletin du Muséum, Adansonia* 3 (3) : 321-358 (1982). 13 autres espèces (dont 3 nouvelles) sont décrites et illustrées ici.

A. J. G. H. Kostermans, Department of Botany, University of Peradeniya, Sri Lanka (1978-1980).

### 14. *Stemonoporus petiolaris* Thwaites. — Pl. 14.

Enum. Pl. Zeyl. : 38 (1858) and 403 (1864), as a synonym of *Vateria petiolaris* Benth. ; TRIMEN, Handb. Fl. Ceylon 1 : 135 (1893) ; BRANDIS, J. Linn. Soc. 31 : 141 (1895) ; LEWIS, Veget. Prod. Ceylon : 47 (1934), *quoad nomen tantum* ; ALSTON, in TRIMEN, l.c. 6 (Suppl.) : 26 (1931), *quoad nomen tantum* ; ASHTON, in DASSANAYAKE (editor), Revised Handb. Fl. Ceylon 1 (2) : 192 (1977), *pro minime parte, quoad C.P. 3151 tantum, cæt. exclud.*

— *Vateria petiolaris* (THW.) BENTH. ex THW., Enum, l.c. : 403 (1864) ; DYER, in HOOKER f., Fl. Brit. Ind. 1 : 315 (1874) ; TRIMEN, Syst. Catal. : 10 (1885) ; Handb., l.c. (as a synonym of *Stemonoporus petiolaris*) ; ASHTON, l.c.

— *Vatica petiolaris* (THW.) A. DC., Prodr. 16 (2) : 621 (1868) ; DYER, l.c.

TYPUS : C.P. 3151, Kitulgalle, May 1853 and 1854, fl. (PDA, 2 sheets).

Tree 10 m, dbh. 25 cm. Bark smooth, grey, thin, hoop-ringed. Live bark brown. Branchlets slender, glabrous or apically with a sparse indumentum of microscopical hairs. Terminal bud small. Leaves chartaceous, oblong, (10-)14-25 × (3-)3.5-6.5 cm, abruptly acuminate (acumen rather slender, with parallel margins, obtuse, up to 2 cm long), base rarely subcuneate ; above rather dull, smooth, glabrous or the secondary nerves and lateral nerves faint, impressed, midrib thin, prominulous, below more glossy, paler, very rough (cystoliths), glabrous, except a sparse, powdery microscopic indumentum on the main nerves, midrib prominent, lateral nerves (10-)13-15 pairs, slender, prominent, erect-patent, near margin rather abruptly arcuately ascendent (not connected), secondary nerves at right angles to midrib, slender, prominulous, towards margin perpendicular to the lateral nerves, in between an obscure reticulation. Petioles slender, straight, 2-7.5 cm long, apical part slightly thickened and with sparse pulverulent indumentum in young leaves.

Inflorescences axillary and extra-axillary on very short (2-5 mm long) thick, minutely

puberulous peduncles, bearing 1-4 flowers in axils of awl-shaped tiny bracts. Pedicels thickish, puberulous, 2 mm long. Sepals ovate, acutish, thickish, up to 7 mm long, outside densely sericeous puberulous. Petals white, obovate-subspathulate, up to 1 cm long, obtuse, longitudinally veined. Stamens 10, minutely puberulous. Fruit globose, smooth.

DISTRIBUTION : Kitulgalle area.

NOTES : The material (apart from the *C.P. 3151*) enumerated by ASHTON, does not belong here ; it differs by thicker leaves with closely packed numerous secondary nerves and different much longer hairs.

ALSTON mentioned a LEWIS specimen from the same area, S.W. Ceylon with a fruit. I have not seen this but I suspect it to be *S. scalarinervis*.

LEWIS's description contains contradictions : he states that the tree is 20 feet high, but in the discussion of the timber, that it attains considerable size. A tree of 20 ft. is hardly a timber tree. Apparently he confused it with another species. He mentioned : Gongalle Range (repeated by ALSTON).

The species was only known from the type locality by a single collection. In April 1980 I rediscovered two tree near Kitulgalle.

MATERIAL STUDIED : *C.P. 3151*, Kitulgalle, 1852 or 1853 (PDA, 2 sheets) ; *Kostermans 28388*, valley of Kelaniya R., near Kitulgalle, alt. ca. 300 m, April, fl. (AAU, G, L, PDA).

#### 15. *Stemonoporus wightii* Thwaites. — Pl. 15.

Enum. Pl. Zeyl. : 37 (1858) and 403 (1864), as a synonym. of *Vateria wightii* Benth. ; A. DC., Prodr. 16 (2) : 620 (1868), as a synonym. of *Vatica wightii* ; DYER, in HOOKER f., Fl. Brit. Ind. 1 : 314 (1874), as a synonym. of *Vateria ceylanica* Wight ; HEIM, Recherches Diptér. : 89 (1892) ; Bull. Soc. Bot. France 39 : 153 (1892) ; TRIMEN, Handb. Fl. Ceylon 1 : 132 (1893) ; BRANDIS, J. Linn. Soc. 31 : 138, tab. III, 26 (1895) ; LEWIS, Trees and flow. Pl. W. and Sabaragamuwa Prov. : 36 (1902) ; Veg. Prod. Ceylon : 44 (1934) ; ALSTON, in TRIMEN, Handb. Fl. Ceylon 6 (Suppl.) : 26 (1931), as a synonym. of *Stemonoporus ceylanicus* ; ASHTON, in DASSANAYAKE (editor), Revised Handb. Fl. Ceylon 1 (2) : 189 (1977), as a synonym. of *S. ceylanicus*.

— *Vateria wightii* (THW.) BENTH. ex THW., Enum., l.c. : 403 (1864) ; DYER, l.c. : 314 (1874), as a synonym. of *Vateria ceylanica* ; TRIMEN, Syst. Catal. : 9 (1885) ; Handb., l.c., as a synonym. of *Stemonoporus wightii* ; ASHTON, l.c.

— *Vatica wightii* (THW.) A. DC., Prodr. 16 (2) : 620 (1868) ; DYER, l.c., as a synonym. of *Vateria ceylanica*.

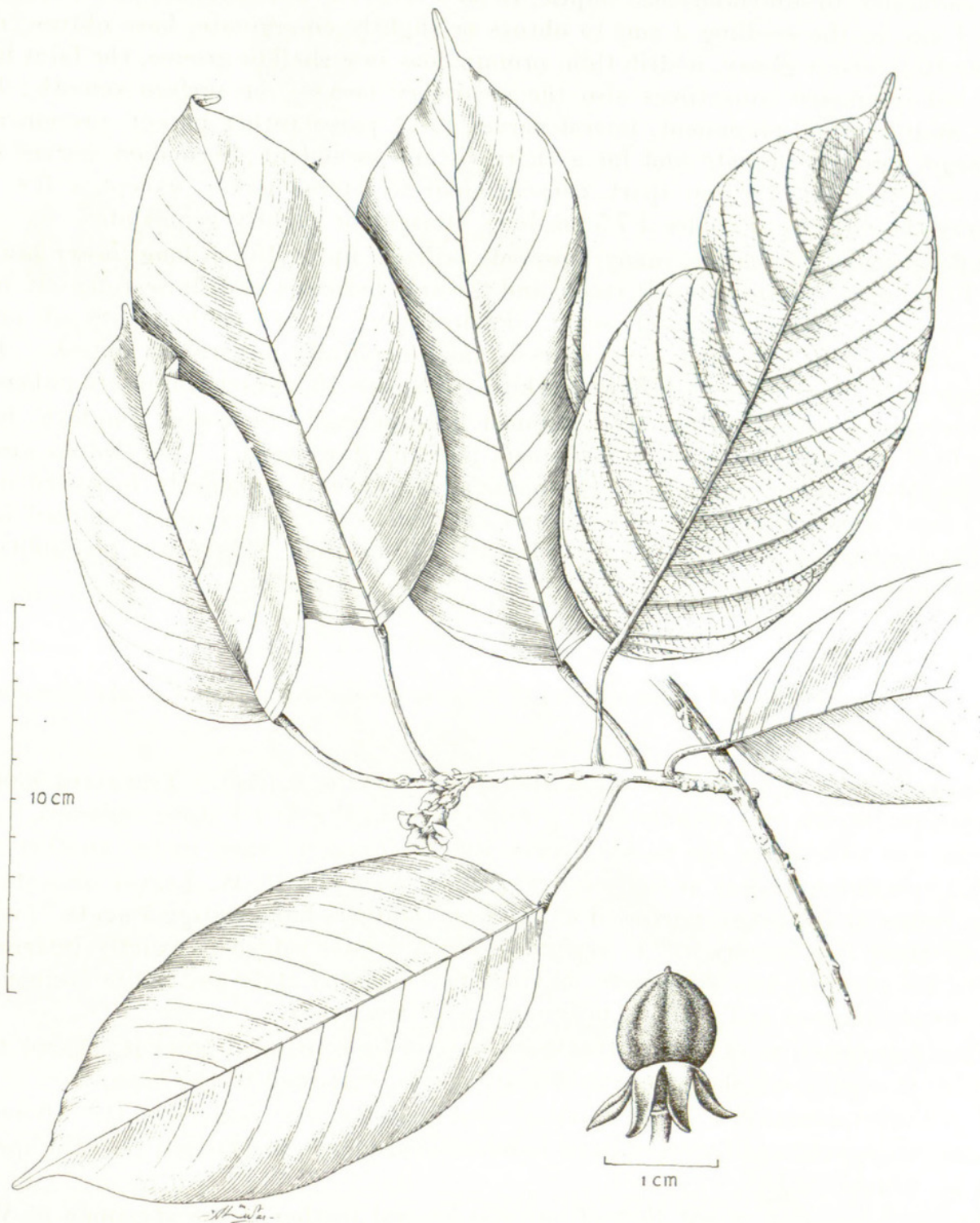
— *Vateria ceylanica* WIGHT, Illustr. Ind. Bot. 1 : 88 (1840) ; THWAITES, Enum., l.c. : 37 (1858), with question mark ; A. DC., Prodr., l.c. : 620 (1868) ; DYER, l.c. : 314 (1874) ; TRIMEN, Syst. Catal. Ceylon : 9 (1885) "*ceylanica*" ; Handb., l.c. : 132, as a synonym. of *Stemonoporus wightii* ; ALSTON, l.c. ; typus : Specimen, seen by DYER (Cal? K?).

— *Stemonoporus ceylanicus* (WIGHT) ALSTON, in TRIMEN, Handb. Fl. Ceylon 6 (Suppl.) : 26 (1931) "*zeylanicus*" ; ASHTON, l.c. : 189 (1977).

— *Stemonoporus macrophyllus* THW., mss. in Herb. Hooker, ex THW., Enum., l.c. : 37 (1858) ; HEIM, Recherches Diptér. : 89 (1892) ; Bull. Soc. Bot. France 39 : 153 (1892).

LECTOTYPUS PROPOSITUM : *C.P. 3415*, Sinharaja, Sept. 1855, fl. (PDA).

Tree, up to 23 m tall (usually up to about 10 m) and dbh. 35 cm. Bark smooth, grey, thin, hoop-ringed. Live bark 4 mm thick, pale yellow. Sapwood pale yellowish.



Pl. 14. — *Stemonoporus petiolaris* Thwaites.

Branchlets thick, angular, glabrous with large, protruding round leaf scars. Leaves glabrous, coriaceous to sub-coriaceous, elliptic,  $15-35 \times 8-15$  cm, apiculate or shortly acuminate (up to 1 cm, in the seedling 3 cm) to obtuse or slightly emarginate, base obtuse (rarely sub-cuneate); above glossy, midrib thin, prominulous in a shallow groove, the faint lateral nerves sub-impressed (sometimes also the secondary nerves), or surface smooth; below glossy, midrib stout, prominent, lateral nerves 15-21 pairs, rather patent, prominent, at the margin strongly arcuate and for a short distant ascendent; secondary nerves scalariformous, numerous, 2-4 mm apart, perpendicular to lateral nerves, except a few short ones near the midrib. Petioles 3-7.5 cm long, straight or slightly geniculate.

Inflorescences paniculate, many-flowered, axillary, up to 15 cm long (lower branches up to 3 cm long). Main peduncle stout, and towards branches and flowers densely microscopically puberulous and minutely scaly. Pedicel stout, up to 1 cm long. Sepals oblong-ovate, acutish, 8-10 mm long, very sparsely microscopically puberulous outside. Petals ovate, up to 15 mm long, pale yellowish white. Stamens 15, densely minutely puberulous.

Fruit globose-ovoid, rather thick-skinned, longitudinally furrowed, roughish, brown, 1.5 cm high (immature), the sepals hardened, pointing downward. "Cotyledons unequal, outer slightly concave, smooth on the outside, deeply and irregularly furrowed on the inside; inner divided into 3 or 4 lobes and between both cotyledons, a ramified fibrous mass the remains of placenta and dissepiments" (BRANDIS). There is a possibility that the fruit opens by valves.

DISTRIBUTION : Wet lowlands, near rivers, S.W. Ceylon, from Colombo southwards.

VERNACULAR NAME : Hal mendora (Hal = *Vateria copallifera*, the fruit is like that one, but smaller and not edible).

NOTES : There is confusion about the proper specific epithet. THWAITES named it *Stemonoporus wightii* and included with a question mark WIGHT's *Vateria ceylanica*. Apparently he was not sure of the conspecificity and described it hence under another name.

WIGHT's description is as follows : "*V(ateria) ceylanica* R. W. Leaves obovate, very obtuse, retuse at the point, narrowed at the base; anthers hairy; stigma acute", whereas on p. 87 there is a remark : "*V. ceylanica* which I have added is exactly intermediate between his (Arnot) two subgenera, having the elongated style and acute stigma of the one and the stamens and axillary inflorescence of the other."

This description is so vague, that nothing can be concluded from it, except that it cannot be *S. wightii*, which has never obovate leaves, narrowed to the base.

DYER saw apparently a WIGHT specimen (not quoted where), which had the inflorescence of *Vateria acuminata* and leaves of some indetermined plant; he thought that the specimen might be misticketed.

As the description is not that of our species and neither is the specimen of WIGHT, I follow THWAITES and TRIMEN and refer *Vateria ceylanica* to the category of an obscure and unidentifiable plant, likely to be a mixture of more than one species.

THWAITES described the leaves as oblong (which means elliptic and linear-oblong), which I do not understand.

LEWIS described the leaves as ovate-oblong and gave the number of laterals as 22-



Pl. 15. — *Stemonoporus wightii* Thwaites.

25 pairs, this is perhaps not this species (there are more examples of such errors in LEWIS' book).

"The petiole of *S. wightii* at the base of the blade has an outer horseshoe of vascular bundles with 16, an inner semicircle with 6 and a central mass with 11, total 33 ducts" (BRANDIS).

MATERIAL STUDIED : *Ashton 2059*, Colombo Distr., Kalutara area, 100 m, March, fl. (PDA); *Kostermans 27899*, Bulathsinhala near Horana, marshy forest, low alt., ster. (G, L, PDA); *Meijer 397*, Labugama, W. of Kalutara Reservoir, along river, ster. (PDA); *Kostermans 27228*, Gilimale forest, Ratnapura Distr., low, Dec., after anthesis (K, L, PDA); *C.P. 3415*, Sinharaja forest, Sept. 1855, young fl. (PDA); *sine coll., sine loc., C.P. 3415* (PDA); *Lewis & J.M.S. s.n.*, Ellaboda Kande, seedling, March 1919 (PDA); *Lewis & J.M.S. s.n.*, March, fl. (PDA); *Lewis*, repeated by ASHTON, Ellaboda Kande and Yatipauwa.

16. *Stemonoporus gilimalensis* Kostermans, *sp. nov.* — Pl. 16.

— *Stemonoporus petiolaris* Auct. (*non* THWAITES), ASHTON, in DASSANAYAKE (editor), Revised Handb. Fl. Ceylon 1 (2) : 192 (1977), *quoad specimen Meijer 404*.

*Arbor mediocris ramulis crassis apicem versus dense minutissime pilosis, foliis coriaceis oblongis vel elliptico-oblongis magnis apiculatis vel obtusis basi rotundatis, supra nervo mediano prominulo, nervis lateralibus tenuibus sub-impressis subtus sparse minutissime pilosis, glabrescentibus, nervo mediano valde prominenti, nervis lateralibus patentibus prominentibus sat numerosis, marginem versus abrupte arcuatis nec connectis, nervis secundariis conspicuis scalariformibus, petiolis crassis longis; floribus paucis, glomerulatis in internodiis, dense minutissime pilosis, pedicellis brevibus, sepalis coriaceis, oblongis, dense pilosis, petalis ellipticis obtusis, staminibus 15, angustis acutis.*

TYPUS : *Meijer 404* (PDA).

Tree 5-8 m tall, dbh. 7.5-25 cm. Bark smooth, grey, hoop-ringed. Branchlets thick, angular, apically densely, microscopically light brown pilose. Leaves coriaceous, elliptic-oblong to oblong, 22-35 × 10-15 cm, apiculate or obtuse, base rounded, above smooth, midrib thin, prominulous (in young leaves so in a groove), lateral nerves very thin, slightly prominulous in a groove; below glossy, paler, with few, very minute hairs, glabrescent, midrib stout, prominent, lateral nerves rather patent to patent, prominent, near the margin abruptly over a short distance ascendent, not connected, 16-18 pairs, from the midrib short, horizontal secondary nerves; secondary nerves numerous, conspicuous, scalariformous, perpendicular to the lateral nerves, reticulation very obscure. Petiole stout, 6-11 cm long, slightly thickened apically, not geniculate.

Flowers few, glomerulate on small burs at the internode, densely, minutely pilose, hairs straight, adpressed. Pedicel thick, 2-3 mm long. Sepals coriaceous, oblong, 7 mm long, densely pilose. Petals elliptic, obtuse, 1 cm long. Stamens 15; anthers very narrow, pointed, with a narrow, oblique aperture apically and slit further down, densely pilose. Stigma included. Fruit unknown.

DISTRIBUTION : Only known from Gilimale forest near Ratnapura.

NOTES : The holotype specimen was identified as *S. petiolaris* by ASHTON, the latter is quite different, with thin, smaller leaves with long slender acumen and very slender



Pl. 16. — *Stemonoporus gilimalensis* Kostermans.

petioles and smaller flowers. It is in leaf characters very much like *S. wightii*, but the leaves are more oblong with more lateral nerves, the sessile inflorescence is quite different from the large panicle of *S. wightii*.

The sterile material was from a larger tree (8 m, dbh. 25 cm), but conforms otherwise very well with the type specimen, but the branchlets and leaves are completely glabrous.

MATERIAL STUDIED : *Meijer 404*, Ratnapura Distr., Gilimale forest, alt. low, wet, evergreen, July, fl. (PDA) ; *Kostermans 27227*, *ibid.*, also along river, ster. (L, PDA).

17. ***Stemonoporus scalarinervis*** Kostermans, *sp. nov.* — Pl. 17.

- *Stemonoporus petiolaris* Auct. (non THWAITES), ALSTON, in TRIMEN, Handb. Fl. Ceylon 6 (Suppl.) : 26 (1931) ; ASHTON, in DASSANAYAKE (editor), Revised Handb. Fl. Ceylon 1 (2) : 192 (1977), p.p., quoad Ashton 2014, 2038 (in PDA = 2138).  
— *Stemonoporus gardneri* Auct. (non THWAITES), ASHTON, l.c. : 190, p.p., quoad specimen Lewis s.n., Wallankande, Dec. 1893 ; LEWIS, Veg. Prod. Ceylon : 45 (1934).

*Arbor, ramulis sat crassis minutissime puberulentibus, foliis coriaceis vel rigide coriaceis, oblongis vel ellipticis, breve et late acuminatis, basi plerumque rotundatis, supra nervo mediano tenue prominulo, nervis secundariis et lateralibus subimpressis vel nullis, subtus sparse minutissime adpresse scabriusculis, nervo mediano valde prominenti, nervis lateralibus erecto-patentibus, prominentibus, ad marginem abrupte breve adscendentibus, nec connatis, nervis secundariis numerosis scalariformibus, prominulis, rete obscuro, petiolis longis, juvenilibus dense adpresse puberulis ; inflorescentis axillaribus vel extra-axillaribus, brevissimis, 1-3 floribus, pedicellis nullis, sepalis oblongo-ovatis sparsissime puberulis, petalis obovato-spathulatis, staminibus 15, fructus ignotus.*

Typus : Ashton 2138 (L).

Tree up to 15 m high and ca. 20 cm diam. (ASHTON). Young branchlets rather thick, microscopically puberulous. Terminal bud small. Leaves coriaceous to rigidly coriaceous, oblong to elliptic, 15-23 × 5-8.5 cm (in juvenile leaves up to 30 × 10, base cuneate), broadly shortly acuminate, tip obtuse, base rounded ; above rather glossy, midrib thin, prominulous, lateral nerves impressed, secondary nerves faint, impressed or inconspicuous, below paler, rather glossy, midrib strongly prominent, lateral nerves prominent, 10-16 pairs, erect patent, near margin over a short distance arcuately ascendent, not connected, secondary nerves scalariform, numerous, closely packed, the ones near the midrib at right angles to it, the others more or less at right angles to the lateral nerves, reticulation in between obscure with a sparse, minute indumentum of adpressed scabrous hairs. Petiole slender, 2-5 cm long, juvenile ones densely adpressed puberulous, straight.

Inflorescences axillary and extra-axillary consisting of a very short (up to 3 mm) thickish peduncle and 1-3 (?) sessile flowers, their base with narrowly ovate, acute thickish minute bracts. Sepals ovate-oblong, acutish, 7 mm long, outside very sparsely microscopically puberulous to glabrous. Petals pale yellow, obovate-spathulate, ca. 1 cm long, longitudinally veined. Stamens 15, anthers puberulous. Fruit unknown.

DISTRIBUTION : Adam's Peak jungle, Gilimale forest near Ratnapura, alt. ca. 100 m.

NOTES : A species not recognized by ASHTON, who included it in *S. petiolaris*. It differs by its much thicker and broader leaves, the short, broad acumen and especially



Pl. 17. — *Stemonoporus scalarinervis* Kostermans.

by the closely packed scalariform secondary nerves. The flowers are sessile and the sepals not sericeous as in *S. petiolaris*. As most material collected under the Smithsonian Flora Project is badly curated and treated, the scrap material of the broken flowers in the type specimen, is not easy to describe.

It might be only a form of *S. lanceolatus*, but the leaves are larger with many more lateral nerves and denser intercostals.

The specimen of LEWIS from Walankande forest, wrongly identified by ASHTON as *S. gardneri*, had once a fruit, according to the label.

MATERIAL STUDIED : *Lewis s.n.*, Sabaragamuwa Prov., Walankande forest, Dec. 1893, fr. (PDA); *Ashton 2138*, Gilimale forest near Ratnapura, 100 m, May, fl. (PDA, in his paper enumerated as 2038); *Ashton 2014, ibid.*, mile 6, culvert 17, sappling of 7 cm and up to 10 cm diam., smooth, grey bark (PDA); *Waas 438, ibid.*, Febr., fl. (PDA), flowers disappeared.

# 18. *Stemonoporus lanceolatus* Thwaites. — Pl. 18.

In HOOKER's Kew J. Bot. 6 : 68 (1854) ; Enum. Pl. Zeyl. : 38 (1858) and 403 (1864), as a synonym. of *Vateria lanceolatus* Benth. ; HEIM, Recherches Diptér. : 89 (1892) ; Bull. Soc. Bot. France 39 : 153 (1892) ; TRIMEN, Handb. Fl. Ceylon 1 : 134 (1893) ; BRANDIS, J. Linn. Soc. 31 : 140 (1895) ; LEWIS, Veget. Prod. Ceylon : 46 (1934) ; ASHTON, in DASSANAYAKE (editor), Revised Handb. Fl. Ceylon 1 (2) : 191 (1977).

— *Vateria lanceolatus* (THW.) BENTH. ex THW., Enum., l.c. : 403 (1864) ; DYER, in HOOKER f., Fl. Brit. Ind. 1 : 315 (1874) ; TRIMEN, Syst. Cat. : 10 (1885) ; Handb., l.c. (as a synonym. of *Stemonoporus lanceolatus*) ; ASHTON, l.c.

— *Vatica lanceolata* (THW.) A. DC., Prodr. 16 (2) : 621 (1868) ; DYER, l.c.

TYPE : C.P. 2658, Ratnapura, Kuruwita, March 1853, fl. (PDA).

Tree, up to 7 m tall, bole 10 cm diam. Branchlets and terminal small bud either completely glabrous or densely, microscopically puberulous. Leaves subcoriaceous, lanceolate to narrowly elliptic, 7-20 × 2-8 cm, base obtuse to shortly acute, apex abruptly shortly obtusely acuminate to subcaudate-acuminate (acumen 5-25 mm long) ; above glossy, glabrous, obscurely, smoothly reticulate, midrib slender, prominulous, lateral nerves slightly impressed, below initially densely, microscopically puberulous, glabrescent, midrib prominent, the 7-12 pairs of lateral nerves erect-patent, towards the margin strongly, arcuately ascendent, prominent, secondary nerves scalariformous, distinct, in between a lax reticulation. Petiole slender, usually not geniculate, 12-25 mm long, glabrescent.

Flowers few, solitary or two together, axillary or supra-axillary. Pedicel pubescent, 5-10 mm long. Sepals lanceolate-linear, concave, acute, up to 8.5 mm long, outside microscopically densely puberulous, ca. 2 mm wide at the base. Petals white, up to 8 mm long, oblong to subspathulate-oblong, obtuse. Stamens 15, microscopically pubescent. Style included in the anthers.

Fruit sub-globose, roughish with rather thin pericarp, brown, up to 2.5 cm diam., the partly reflexed, partly patent sepals up to 12 mm long.

DISTRIBUTION : So far only known from the Kuruwita area at 500 m alt. and from Gilimale forest in wet, evergreen forest.



Pl. 18. — *Stemonoporus lanceolatus* Thwaites.

NOTES : The original description does not mention fruit, hence the holotypus is the sheet in flower from Kuruwita near Ratnapura, fl., March 1853. On the same sheet is a specimen from the same locality, collected Sept. 1859, after the publication had appeared. The fruiting sheet of *C.P. 2568* is marked *Vateria lanceolata* Thw. and hence must be of a later date than the sheet with two flowering branches.

ASHTON's label of his specimen 2014 (not mentioned in his paper) from Gilimale indicated as a sapling collection of trees of 7 m and 10 cm diam., which implies that the full grown trees might be even taller. The number *Ashton 2010* is not represented in PDA, although indicated as such by ASHTON.

The sapling collection shows a dense pubescence on lower leaf surface and twigs. The specimen *Huber 527* is completely glabrous, although in flowering stage. It has a sparser indumentum on the sepals which are somewhat longer ; at this stage I have included it in *S. lanceolatus*.

Most leaves are not geniculate.

MATERIAL STUDIED : *C.P. 2568*, Ratnapura Distr., Kuruwita, March 1853 and Sept. 1859, fl. (PDA, 2 sheets) ; *Silva 114*, below Kuruwita & Eratna, Febr., fl. (PDA) ; *Huber 527*, Ratnapura, Distr., Sudugala near Kuruwita, 520 m, Nov., fl. (PDA).

19. ***Stemonoporus latisepalum*** Kostermans. — Pl. 19.

*In Liber gratulat. de Wit* : 227, fig. 4 (1980).

TYPE : *Wass 1688* (PDA).

Tree 15 m tall, bole 8 m, dbh. 23 cm. Main branches mostly horizontal. Apical part of branchlets, petioles of young leaves, inflorescence and sepals densely minutely puberulous, the indumentum fugaceous except in inflorescence and sepals. Leaves glabrous, rigidly coriaceous, oblong-elliptic, 11-14 × 6-8 cm, shortly, bluntly, rather broadly acuminate, base rounded ; above smooth, midrib slender, prominulous in a shallow depression, lateral nerves slightly impressed, causing bullateness between the lateral nerves ; below paler, midrib strongly prominent, lateral nerves 8-10 pairs, erect-patent, arcuate towards the margin, not connected into a marginal vein ; secondary nerves close to the midrib slender, prominulous, horizontal, the others scalariform and ultimately perpendicular to the lateral nerves, reticulation none. Petioles 2-3 cm long, often slightly swollen apically.

Inflorescences extra-axillary, sub-paniculate, 1.5 cm long, flowers and short branches very few. Pedicel thickish, 3 mm. Sepals rather thin, elliptic, concave, 5-6 mm long, 3-3.5 mm wide. Petals yellow, only slightly larger. Stamens 15 ; filaments short, in groups of three connate at the base. Style slightly exserted. Fruit unknown.

DISTRIBUTION : Sub-montane forest, only known from the type locality.

NOTES : Resembles *S. kanneliyensis* by the venation, but less lateral nerves, a short, broad, obtuse acumen and not impressed midrib. The lateral nerves are not forming a marginal vein. Moreover the inflorescence is paniculate and the sepals unusually broad and resemble the petals. Also near *S. affinis*, but inflorescence longer, the leaves larger and differently shaped ; the acumen short and broad.



Pl. 19. — *Stemonoporus latisepalum* Kostermans.

MATERIAL STUDIED : *Wass* 1688, Ratnapura Distr., Mangadala Oya forest, along trail to Maskeliya from Malibode, 700 m, June, fl. (PDA).

20. *Stemonoporus affinis* Thwaites. — Pl. 20.

In HOOKER's Kew J. Bot. 6 : 68 (1854) ; Enum. Pl. Zeyl. : 38 (1858) and 403 (1864), as a synonym. of *Vateria affinis* Benth. ; A. DC., Prodr. 16 (2) : 621 (1868), as a synonym. of *Vatica thwaitesii* A. DC. ; DYER, in HOOKER f., Fl. Brit. Ind. 1 : 314 (1874), as a synonym. of *Vateria affinis* ; TRIMEN, Handb. Fl. Ceylon 1 : 134, tab. 15 (1893) ; ALSTON, in id. 6 (Suppl.) : 26 (1931) ; BRANDIS, J. Linn. Soc. 31 : 140 (1895) ; ASHTON, in DASSANAYAKE (editor), Revised Handb. Fl. Ceylon 1 (2) : 189 (1977). — *Vateria affinis* (THW.) BENTH. ex THW., Enum., l.c. : 403 (1864) ; A. DC., l.c. ; DYER, l.c. : 314 ; TRIMEN, Syst. Catal. : 10 (1885) ; Handb., l.c. (as a synonym. of *Stemonoporus affinis*) ; ASHTON, l.c. — *Vatica thwaitesii* A. DC., Prodr. 16 (2) : 621 (1868) ; DYER, l.c. ; TRIMEN, l.c. ; ASHTON, l.c.

TYPUS : C.P. 2430, Hunasgiriya, at about 4000 ft. (PDA).

Tree, 8-13 m high, dbh. up to 40 cm, coppicing at base. Bark smooth, grey. Branchlets of flush and midrib of flush leaves underneath very sparsely microscopically puberulous, soon glabrous. Terminal bud small. Branchlets thickish. Leaves stiffly coriaceous, glabrous, subovate-elliptic to elliptic, (4-) 6-11 × (2-) 3-7 cm, rounded and abruptly acuminate (acumen slender, obtuse, up to 1 cm long, in saplings up to 2.5 cm), base rounded ; above glossy, midrib thin, prominulous in a shallow groove, lateral nerves thin, obscurely impressed, sometimes the impressed secondary nerves visible, the leaves bullate, below glossy, midrib strongly prominent, lateral nerves 7-8 (-11) pairs, erect-patent, slender, prominent, near margin for a short distance arcuately ascendent, not connected, secondary nerves very slender, scalariformous, in between a dense reticulation. Petioles rather slender, 1-3 cm long, straight, apical part slightly thickened.

Inflorescence axillary, 0-5 mm long, bearing one or two flowers ; bracts large, narrowly oblong, acutish, 5 mm long. Pedicels thickish, 5-7 mm long, sparsely, minutely puberulous. Sepals rather fleshy, narrowly oblong to subovate-oblong, rather obtuse to acutish, up to 8 mm long, outside sparsely, microscopically puberulous. Petals whitish yellow (fresh), subovate-orbicular, 1 cm long, obtuse, fleshy. Stamens 15, 4 mm long.

Ripe fruit depressed globose, thick-skinned, smooth, initially slightly ribbed, up to 3 cm in diam. and 2.5 cm high, roughish, brown, the petals hardened, pointing downward. "Embryo bright pink" (TRIMEN). "Embryo bright pink, cotyledons divided into numerous lobes" (BRANDIS).

DISTRIBUTION : Knuckles Mts., according to LEWIS also on Meriacotte Peak (S. and W. flank), upper Bambarabotuwa, upper Atakalan Korale and Rakwana (according to LEWIS, repeated by ASHTON).

Ecology : Reaches canopy size in the low mountain forest.

NOTES : The ripe fruit is smooth and not grooved as stated by TRIMEN and is irregularly dehiscent.

The base of the leaves was correctly described by TRIMEN, they are not subcordate or broadly cuneate as stated by ASHTON. They are not scabrous below as stated by TRIMEN.



Pl. 20. — *Stemonoporus affinis* Thwaites.

ASHTON's remark, that the localities enumerated by ALSTON (which ALSTON copied from LEWIS, a book, which ASHTON did not see) appears to be based on wrong identifications, has no base. The identifications are of LEWIS, not of ALSTON; no specimens are extant.

There are two sheets of *C.P. 2430* in Peradeniya, one has the pencilled notes : Hunasgiriya at 4000 ft., April 1851 and Oct. 1850, with two flowering branches and a package of fruit, and also another pencilled note : Knuckles, Sept. 1858, in fl. The other sheet is a fruiting specimen and is unmarked.

Some mistake is evident in the notes. THWAITES described a flowering specimen in 1854 from Hunasgiriya. Hence the flowering specimen is the holotypus and the attached fruit package belongs to the other unmarked sheet, which was apparently from the Knuckles.

“ In receptacle large cavities, filled with resin ” (BRANDIS).

MATERIAL STUDIED : *Ashton 2055*, Knuckles Mts., Rangala-Corbett's Gap road, 1500 m, March, fr. (PDA) ; *2056, ibid.*, seedling (PDA) ; *Nooteboom 3055*, Rangala to Looloowatte, Sept., fr. (L, PDA) ; *Balasubramaniam 2192*, Rangala, Oct., fl. (G, L) ; *Kostermans 27524*, fr. (PDA) ; *sine coll.*, Sept. 1888, ster. (PDA) ; *Silva 15*, Knuckles, Nov., fr. (PDA) ; *C.P. 2430*, Knuckles, Sept. 1858 (?), fl. (PDA) ; *C.P. 2430*, Hunasgiriya, April 1851, fr. (PDA).

## 21. *Stemonoporus acuminatus* (Thw.) Beddome. — Pl. 21.

Fl. Sylvat. : 100 (1870) ; TRIMEN, Handb. Fl. Ceylon 1 : 133 (1893), *p.p., quoad forma a, exclud. C.P. 3595*, but *includ. C.P. 3474* ; PIERRE, Fl. for. Cochinch. 17 : tab. 258, *g* (1893) ; BRANDIS, J. Linn. Soc. 31 : 139 (1895) ; LEWIS, Trees & Fl. Pl. W. & Sabaragamuwa Prov. : 37 (1902) ; Veget. Prod. Ceylon : 45 (1934), localities doubtful ; the note : rare species, apparently found below Badulla under *S. gardneri*, belongs here ; ALSTON, in TRIMEN, Handb. Fl. Ceylon 6 (Suppl.) : 26 (1931) ; ASHTON, Blumea 20 : 365 (1973) ; in DASSANAYAKE (editor), Revised Handb. Fl. Ceylon 1 (2) : 188 (1977), *p.p., exclud. C.P. 3595* and *Ashton 2121, 2122, 2123, 2124, 2125, 2126*.

- *Vateria acuminata* THW. (non HAYNE), Enum. Pl. Zeyl. : 403 (1864), *p.p., exclud. C.P. 3595* ; DYER, in HOOKER f., Fl. Brit. Ind. 1 : 314 (1874), as a synonym of *Vateria jucunda* Thw. ex Dyer, *p.p., exclud. cit. Medamahanuswara* ; TRIMEN, *l.c.* ; ASHTON, *ll.cc.*
- *Vateria acuminata* (THW.) A. DC., Prodr. 16 (2) : 622 (1868), *p.p., exclud. C.P. 3595* ; DYER, *l.c.*
- *Vesquella acuminata* (THW.) HEIM, Recherches Diptér. : 90 (1892), combination not printed ; Bull. Soc. Bot. France 39 : 153 (1892) ; DYER, *l.c.* : 383 ; BRANDIS, *l.c.* ; ASHTON, *ll.cc.*
- *Vateria jucunda* THW. ex DYER, in HOOKER f., Fl. Brit. Ind. 1 : 314 (1874) ; TRIMEN, Syst. Catal. : 10 (1885) ; Handb. Fl. Ceylon, *l.c.* (as a synonym of *Stemonoporus acuminatus*) ; ASHTON, *ll.cc.*
- *Sunapteopsis jucunda* (THW.) HEIM (combination not printed), Recherches Diptér. : 92 (1892) ; DYER, *l.c.* ; BRANDIS, *l.c.* ; ASHTON, *ll.cc.*

LECTOTYPUS : *C.P. 3687* ; syntypus : *C.P. 3474* (later included in *3595*).

Tree 12-20 m tall, dbh. 20-40 cm. Branchlets thickish with microscopical scales and simple hairs or glabrous. Leaves coriaceous, glabrous (in very young leaves midrib below puberulent), varying from lanceolate-oblong to elliptic-oblong to ovate-oblong, 7-17 × 2.5-7 cm, gradually acuminate to acuminate (acumen with broad base, 0.5-3 cm long), base rounded to obscurely sub-cordate, above glossy, smooth to obscurely densely reticulate, midrib thin, prominulous or so in a slight depression ; below glossy, densely, microscopically, obscurely reticulate, midrib prominent ; lateral nerves 8-12 pairs, slender, erect-

patent, arcuate (especially at the margin), connected by obscure but distinct scalariform secondary nerves. Stipules (THWAITES) falcate-lanceolate, 7.5 mm, caducous (might be also *S. laevifolius*). Petiole slender, 3-7 cm, straight.



Pl. 21. — *Stemonoporus acuminatus* (Thwaites) Beddome.

Inflorescences axillary and extra-axillary, consisting of bundles of few-flowered, 1-5 cm long racemes or the slender, puberulent peduncles having a few short branchlets. Pedicels microscopically puberulous, *ca.* 5 mm long. Sepals oblong to subovate-oblong, acutish, sparsely puberulous (denser at base), up to 7 mm long, acutish. Petals slightly longer, oblong, yellowish. Stamens 15.

Fruit depressed globose, rusty, roughish, rather thin-skinned, up to 3 cm diam., 2.5 cm high; the sepals not enlarged, hardened, turned downwards. "Cotyledons thin, flat, much folded and crumpled. Unripe seed with some gelatinous albumen. The embryo does not fill up the cavity completely, at the base of the pericarp inside is a fleshy, lacinate cup" (BRANDIS).

DISTRIBUTION : S.W. Ceylon, Sinharaja forest, Rakwana part, and Ambagamuwa Prov. Wet forest.

NOTES : As discussed under *S. laevifolius*, TRIMEN already recognized two forms in the classical material of *S. acuminatus* at his disposal. This was confirmed by ASHTON, who collected additional material. *S. acuminatus* proper I have restricted to *C.P.* 3687 (PDA) and the sheet originally *C.P.* 3474, later included (PDA) in *C.P.* 3595, marked Badulla. It is easily separable from *S. laevifolius* (formerly *S. acuminatus*, *C.P.* 3595) by the conspicuous more erect and more arcuate and less numerous lateral nerves (on the lower leaf surface) and by the puberulous sepals. One sheet of *C.P.* 3687 (PDA) bears a flowering branchlet with much broader leaves, corresponding with those collected by ASHTON on Kiribatgale. With the scanty material at hand, I have left all collections together. ASHTON has selected *C.P.* 3687 as the lectotype, in which I agree.

In the treatment by LEWIS (Useful plants, *l.c.*) there are discrepancies. The quotation Badulla, belonging to this species is mentioned under the foregoing *S. gardneri*. Furthermore he says that the species is rare, but then enumerates a host of localities, which I have hence not repeated here.

The Badulla specimen, mentioned by THWAITES, is quoted by TRIMEN as collected by J. BAILEY. It was apparently first numbered *C.P.* 3474, but mentioned by THWAITES in brackets (I cannot explain why), TRIMEN left the brackets out. In Peradeniya it is numbered *C.P.* 3595. It might have been collected from a locality in the utmost western part of the Badulla Distr., which conforms with the localities, enumerated here.

The broader leave specimens show much likeness to *S. affinis*, but the leaves have many more lateral nerves. It is certainly related to *S. gardneri*.

"The sepals are slightly imbricate (in fig. 11 of PIERRE incorrectly valvate)" (BRANDIS).

HEIM based *Vesquella* on the fibrous, lacinate cup at the base inside of the pericarp; this was found later by BRANDIS also in *S. canaliculatus*.

*Sunapteopsis* Heim was published in a way not common and not advisable in taxonomy: "Genre ? *Sunapteopsis* Heim, vel *Stemonopor.* sect." He said that he wanted to create a new name for *Vateria jucunda* Thw. *fide* DYER, but failed also to print that new name.

HEIM saw no flowers and created his doubtfull genus mainly on the characters : large, non reflexed unequal sepals under the fruit. Furthermore he quoted erroneously 25 instead of 15 stamens. In the subsequent publication in Bull. Soc. Bot. France, the genus has disappeared noiselessly and appears the name *Vesquella acuminata* Heim.

BEDDOME's plate has the stamens wrongly drawn. They are much longer and only the tip of the style emerges. Furthermore the anthers have the normal shape of those of *Stemonoporus* : the margins of the larger valve touch each other and leave an oblique apical aperture, the lower valve, clasped by the margins of the larger valve, closes the basal part of the anther.

THWAITES — after having named the species *Vateria acuminata* — discovered that the specific epithet was occupied by *Vateria acuminata* Hayne and changed the name in mss. to *Vateria jucunda*. The latter name was taken up by DYER (not by TRIMEN, as ASHTON says) and validly published, not a nomen as erroneously quoted by ASHTON. As *Vateria acuminata* Hayne is based on a specimen, different from that of *Vateria acuminata* Thw., the specific epithet can be used in *Stemonoporus*.

MATERIAL STUDIED : Ashton 2122 and 2123, Pelmadulla, Kiribatgalle, bamboo forest, rocky, 900 m, March, fl. (PDA) ; 2124, *ibid.*, sapling of 2 m, leaves  $16 \times 6$  cm, petiole 7 cm long (PDA) ; Kostermans 28032, *ibid.*, ster. (L) ; Waas 1756, Marathagaa, Ratnapura Distr., 1200 m, June, fr. (PDA) ; J. Bailey s.n., Badulla Distr., fl. (PDA = C.P. 3474, later in PDA : C.P. 3595) ; C.P. 3687, Ambagamuwa Prov., Nov. 1850 or 1852, fl. (PDA, 2 sheets) ; W. of Eldorado Estate, Rakwana (LEWIS and quoted also by ASHTON ; no specimen) ; Gunatilleke 6091 A, Deniyaya side of Sinharaja forest, 900 m, Dec., fl. (G, L, PDA) ; Kostermans 28100, *ibid.*, March, young fr. (L).

## 22. *Stemonoporus moonii* Thwaites. — Pl. 22.

Enum. Pl. Zeyl. : 39 (1858), with question mark ; *ibid.* : 403 (1864), as a synonym of *Vateria moonii* ; A. DC., Prodr. 16 (2) : 622 (1868), as a synonym of *Vatica moonii* ; TRIMEN, Handb. Fl. Ceylon 1 : 137 (1893) ; ALSTON, *in id.* 6 (Suppl.) : 27 (1931) ; BRANDIS, J. Linn. Soc. 31 : 142 (1895) ; LEWIS, in the Ceylon Observer (date unknown, quoted by ALSTON) ; ASHTON, Blumea 20 (2) : 366 (1972), as an exclud. species ; in DASSANAYAKE (editor), Revised Handb. Fl. Ceylon 1 (2) : 193 (1977), *idem*.

— *Vateria moonii* (Thw.) BENTH. ex Thw., Enum., l.c. : 403 (1864) ; DYER, in HOOKER f., Fl. Brit. Ind. 1 : 316 (1874) ; TRIMEN, Syst. Cat. : 10 (1885) ; Handb., l.c. ; LEWIS, Veget. Prod. Ceylon : 49 (1934) ; ASHTON, *ll.cc.*

— *Vatica moonii* (Thw.) A. DC., Prodr. 16 (2) : 622 (1868) ; DYER, l.c.

TYPE : C.P. 1792 (PDA).

Small, slender tree, up to 4 m tall with few, short branches, the bole up to 4 cm in diam. with grey, smooth bark, the tree resembling strongly *Agrostistachys* (*Euphorbiaceae*) and equally called in Sinhala : *beroo*. The stems often flopped over and the side branches curved upwards. Branchlets thick with large, round, protruding leaf scars, apically densely brown pilose (hairs long, simple). Stipules persistent, linear or very narrowly lanceolate-linear, acute, 1.5-4 (flush) cm long, initially densely pilose, soon glabrous. Flush leaves pendulous, stiff, completely enrolled, greyish brown. Leaves aggregate at the apex of the branches, stiffly coriaceous, narrowly subobovate oblong,  $14-48 \times 2.5-8$  cm, rather obscurely to distinctly acuminate, gradually tapered to the rounded base ; above glabrous, glossy, smooth or obscurely reticulate, the lateral nerves and their accessory ones impressed, midrib thin, prominulous ; below paler, glossy, midrib prominent, lateral nerves 12-30 pairs, slender, prominent, erect-patent, strongly arcuately sub-ascendent, the lowest pair sometimes more erect ; in between much shorter accessory lateral nerves ; secondary nerves thin, prominulous, near the midrib perpendicular to the midrib, towards the margin perpendicular to the lateral nerves, parallel, in between rather lax, obscure, minute reticulation. Petioles 6-20 mm long, thickish, densely pubescent, glabrescent.

Flowers solitary or in bundles of 1-3 in the axils of fallen leaves just below the leaves. Pedicel up to 2 mm long, densely pubescent, subtended by linear, long bracts. Sepals narrowly lanceolate, acutish, up to 12-13 mm long, outside densely or sparsely light brown

pubescent. Petals elongate-ovate, acute, up to 11 mm long, inside white, outside with a central light red longitudinal band. Style thin, 2 mm long, the minute stigma visible above the cone of 15 stamens. Stamens white with short filaments, the upper anther valve bulging in the centre, folded, resulting in an oblique tubular slit apically and one slit below the bulge.

Fruit sub-globose, 3 cm diam., light brown, pericarp thin (1 mm), divided into polygonal "fields", scurvy; cotyledons very large, folded, conduplicate, green; radicle 1 cm long, 4 mm diam., red, with minute appressed hairs, except the tip; sepals linear, appressed to the fruit base.

DISTRIBUTION : Marshy, periodically inundated land along slow running streamlet in lowland in Kalutara Distr., Matugama area near Bulatsinhala near Honaka.

NOTES : THWAITES commented on this species, of which at that time (1858) only two specimens were known, collected by MOON around about 1820-25, one according to THWAITES was sterile, the other had flower buds, which he dissected and found to his surprise that this was a *Stemonoporus* with the correct number of stamens, etc., but because of the peculiar long numerous stipules, he included it in *Stemonoporus* with an interrogation mark and mentioned its locality as Maturata, likewise with an interrogation mark. TRIMEN in 1893 described the pedicels and sepals. He had apparently at hand the sole sheet, now in the Peradeniya Herbarium. He commented on the species as : "It is greatly to be hoped, that this curious plant may be rediscovered."

ASHTON failed to look in the convolute, attached to the Peradeniya sheet, which he annotated and stated erroneously, that the sheet was now sterile, although it had still two flowers without corolla and stamens.

Not taking heed of THWAITES's remarks, he opinioned that this was not *Stemonoporus* but likely *Sterculiaceæ* or even *Euphorbiaceæ*.

ALSTON produced some confused statements. "It is scarcely likely to belong to *Stemonoporus* and may not even be a *Dipterocarp* at all" and then some lines further : "should probably form a separate genus" (in *Dipterocarpaceæ*). THWAITES thought that MOON's specimen perhaps was from Maturate, which is in the mountains near Nuwara Eliya. I am sure that this is a mistake for Matugama in the lowland, Kalutara District, near the place where we found the tree.

LEWIS noted, that he had seen it in the Maguru Ganga valley near Honaka, on waturana land, but unluckily had not collected it (waturana is wet land).

Following this tip of LEWIS I started investigations on Maguruganga near Honaka and by a lucky coincidence, this was also the home site of Dr. GUNATILLEKE, who approached a rubber planter in the Bulatsinhala area, who informed him that he was the private owner of a small patch of marshy forest along a streamlet.

Dr. GUNATILLEKE and I explored this mosquito infested, degraded forest, but failed to find *Stemonoporus moonii*, although several other very rare trees were discovered.

Not wanting to give up, I suggested to follow the rivulet and our perseverance was rewarded and many specimens of *Stemonoporus moonii*, believed to be extinct, were discovered along a muddy depression with *Areca coccinea* (in itself a rare tree) and along the stream-

let. Some weeks later I could manage to collect the flowers, which corroborated my previous opinion that this was a "good" *Stemonoporus*.

I wrote a personal letter to the President of Sri Lanka (Mr. JAYAWARDHANA) to ask his help to protect this costly piece of swampy forest, perhaps the last, not converted into paddy fields, and received immediately strong support.

MATERIAL STUDIED : *Kostermans* 27857, Kalutara Distr., Bulatsinhala, near Honaka, rubber estate Walauwewatte, ca. 25 miles E. of Kalutara, along muddy, swampy rivulet, 7 Oct. 1979, ster. (G, L, PDA) ; 27961, Dec., in flush (G, L) ; 27880, 19 Oct., fl. (AARH, G, L, PDA) ; *Moon* s.n., C.P. 1792, near Matugama, fl. (PDA).



Pl. 22. — *Stemonoporus monii* Thwaites.

**Subgenus *Monoporandra* (Thw.) Kostermans, subg. & stat. nov.**

- *Monoporandra* THW., in HOOKER's Kew J. Bot. 6 : 69 (1854).
- *Stemonoporus* sect. *Monoporandra* (Thw.) HEIM, Recherches Diptér. : 89 (1892).

Stamens 5. Ovary 2, rarely 3-celled. Species 4.

**23. *Stemonoporus cordifolius* (Thw.) Alston. — Pl. 23.**

In TRIMEN, Handb. Fl. Ceylon 6 (Suppl.) : 27 (1931) ; WORTHINGTON, Ceylon Trees : 71 (1959) ; ASHTON, in DASSANAYAKE (editor), Revised Handb. Fl. Ceylon 1 (2) : 190 (1977), *exclud. Lewis* s.n., Meddakande, Balangoda, *quoad S. angustisepalum*.

- *Monoporandra cordifolia* THW., in HOOKER's Kew J. Bot. : 6 : 70 (1854) ; Enum. Pl. Zeyl. : 39 (1858) ; A. DC., Prodr. 16 (2) : 637 (1868) ; BEDDOME, Fl. sylv., tab. 101 (1870) ; DYER, in HOOKER f., Fl. Brit. Ind. 1 : 317 (1874) ; PIERRE, Fl. for. Cochinch. 17 : tab. 258, F (1892) ; TRIMEN, Syst. Catal. : 10 (1885) & Handb. Fl. Ceylon 1 : 137 (1893) ; BRANDIS, J. Linn. Soc. 31 : 142 (1895) ; ASHTON, l.c.
- *Vateria cordifolia* (THW.) THW., Enum., l.c. : 404 (1864) ; A. DC., l.c. : 637 ; DYER, l.c. : 317 (as a synonym of *Monoporandra cordifolia*) ; TRIMEN, l.c. ; ASHTON, l.c.

TYPUS : C.P. 2647, Ambagamuwa & Saffragam Distr., 1000 m, fl. (PDA, 2 sheets).

Tree, up to 15 m tall, bole up to 6 m and 35 cm in diam. Flush yellowish. Bark smooth, grey, obscurely fissured, strips somewhat wavy, 1-2 mm wide. Live bark 3 mm, pale. Branchlets slender, puberulous or glabrous. Terminal bud small. Leaves coriaceous, glabrous (except midrib below in young leaves), ovate or oblong-ovate, 3-11 × 1-5.5 cm, conspicuously acuminate (acumen obtuse, slender, 1-3 cm long), base rounded to subcordate and here with slightly incurved margins, both sides glossy, upper surface with thin, impressed midrib, the laterals faint, sometimes in an obscure groove, very minutely areolate-reticulate, below midrib prominent, the 6-7 erect-patent lateral nerves thin but very distinct, arcuate near the margin, secondary nerves parallel, horizontal, the basal ones more perpendicular to the lateral nerves, reticulation with a very fine mesh. Pedicel very thin and long, usually strongly geniculate, 1-2.5 cm long, glabrous or sparsely puberulous.

Panicles axillary, glabrous to minutely puberulous, up to 2.5 cm long with thin peduncles and short, thin branches, up to 6-flowered. Pedicel filiform, 1 cm long. Sepals narrowly ovate-lanceolate, up to 4 mm long, acute. Petals lemon-yellow, oblong, up to 10 mm long. Stamens 5, densely puberulous, narrowly ovate, acute, the apical marginal parts of the large valve completely touching each other, forming a tube with oblique opening at apex. Ovary 2-3-celled, puberulous. Style slightly shorter than the stamens. Fruit globose, thick-skinned, 1-1.5 cm diam., red-brown, scabrous, the sepals not enlarged, pointing downward.

DISTRIBUTION : Southern slopes of Adam's Peak, between 700 and 1000 m approx., locally not uncommon.

NOTES : The species is very close to *S. elegans* and could be considered to be only a variety, but the acumen is not so pronounced and slender, the reticulation is finer, the petioles are longer and thinner, the inflorescences are paniculate with 6 flowers (sometimes also paniculate in *S. elegans*, but with less flowers). The main difference, however, are the conspicuous lateral nerves on the lower leaf surface (in *S. elegans* very obscure).

ASHTON called the lateral nerves first obscurely elevated above, but some lines further he calls them shallowly impressed, actually they are slightly prominulous, but often in a slight depression ; the secondary nerves are only scalariform in part of the leaf.

DE CANDOLLE called the inflorescence a raceme, however, they are paniculate. The petals are much longer than indicated by ASHTON.

The species occurs also in secondary forest and in non-Dipterocarp forest.

The specimen *Lewis s.n.* from Meddakande, Balangoda, enumerated by ASHTON, represents *S. angustisepalum*.



Pl. 23. — *Stemonoporus cordifolius* (Thwaites) Alston.

MATERIAL STUDIED : *C.P. 2647*, Ambagamuwa, Dec. 1852, fl., fr. (PDA, 3 sheets); *ASHTON 2139* and *2140*, Balangoda-Bogawantalawa Rd., 1600 m, May, buds (PDA); *Meijer 963*, *ibid.*, ster. (PDA); *Bernardi 15994*, *ibid.*, 1800 m, Dec., fr. (PDA); *Nooteboom 3393*, *ibid.*, 1470 m, Oct., fl. (PDA); *Worthington 3232*, Balangoda Estate Forest, 1400 m, Oct., fl. (PDA); *770*, *ibid.*, 1300 m, ster. (PDA); *6546*, *ibid.*, Galbodde, ster. (PDA); *Ashton 2114*, above Carney Estate, Gilimale forest, Apr., buds (PDA); *Huber 535*, mountains N. of Maratenne, Nov., fl. (PDA); *844*, Aug., fl. (PDA); *Waas 1728* and *1730*, 1000 m, June, fl. (PDA).

24. *Stemonoporus elegans* (Thw.) Alston. — Pl. 24.

In TRIMEN, Handb. Fl. Ceylon 6 (Suppl.) : 27 (1931); ASHTON, in DASSANAYAKE (editor), Revised Handb. Fl. Ceylon 1 (2) : 190 (1977).

— *Monoporandra elegans* THW., in HOOKER's Kew J. Bot. 6 : 69, tab. 2, fig. B (1854); Enum. Pl. Zeyl. : 39 (1858); A. DC., Prodr. 16 (2) : 636 (1868); DYER, in HOOKER f., Fl. Brit. Ind. 1 : 317 (1874); TRIMEN, Syst. Catal. : 10 (1885); Handb. Fl. Ceylon 1 : 138 (1893); BRANDIS, J. Linn. Soc. 31 : 142 (1895); ASHTON, *l.c.*

— *Vateria elegans* (THW.) THW., Enum., *l.c.* : 404 (1864); TRIMEN, *l.c.* : 138; ASHTON, *l.c.*

TYPE : *Gardner s.n.*, *C.P. 371*, Base of Adam's Peak, fl. (PDA, 2 sheets).

Small to medium sized tree (cf. notes), glabrous in all its parts. Branchlets thin, glossy; terminal bud small. Leaves coriaceous slightly concave, oblong to elliptic, very rarely subovate-oblong, 5-9 × 1.5-3 cm, caudate-acuminate (acumen slender, obtuse, 5-20 mm long), base shortly acutish to rounded and here the margins often revolute, both sides glossy, obscurely smoothly reticulate, above the thin midrib impressed, below midrib prominent, the 6-8 pairs of erect-patent lateral nerves thin, prominulous, as strong as the intermediate reticulation, but visible, lateral nerves at margin strongly arcuate. Petiole thin, not geniculate, 5-10 mm long.

Racemes subterminal and axillary, sometimes paniculate, few-to 6-flowered, peduncle thin, up to 15 mm long; pedicel thin, 5-10 mm long. Sepals narrowly ovate, acute, up to 5 mm, microscopically sparsely adpressed puberulous. Petals oblong, longer than sepals, yellowish white to lemon yellow; buds yellow. Stamens 5, the large flap with completely closed margins, forming a tube with a terminal oblique opening. Ovary 2-celled. Style obscured by the stamens, stigma punctate. Fruit globose, thin-skinned, 10-15 mm diam., the 3-5 mm long thin sepals turned downward. "Unripe seeds have thin fleshy cotyledons emarginate at apex" (BRANDIS).

DISTRIBUTION : Southern slopes of Adam's Peak, at about 1000 m altitude, rather common.

NOTES : Most labels give the tree as from 3-8 m high, *Ashton 2915* states that it is 20 m high and 30 cm in diam. (in his paper he states 20 m, but only 20 cm diam.). The leaves are certainly not ovate as described by ASHTON, or lanceolate as described by TRIMEN. DE CANDOLLE described them correctly as oblong to sub-elliptic.

WAAS indicates the petals as white, ASHTON as dark lemon yellow, DAVIDSE as yellowish white. Unluckily the Flora Project material is so badly conserved and mounted that not a single flower is present.



Pl. 24. — *Stemonoporus elegans* (Thwaites) Alston.

MATERIAL STUDIED : *Gardner s.n.*, C.P. 371, Adam's Peak, at ca. 700 m, fl., fr. (PDA, 2 sheets) ; *Davidse & Sumitrarachchi 8742*, N.E. of Carney, S. approach of Adam's Peak, Nov., fl. (PDA) ; *Bernardi 15789*, *ibid.*, Dec., fr. (PDA) ; *Meijer 509*, *ibid.*, 1000 m, July, fl. (PDA, in package wrong flower) ; *Ashton 2915*, *ibid.*, 900 m, Apr., fl. (PDA), quoted as 2115 ; *Waas 1833*, *ibid.*, Dotalugale forest, 1000 m, Aug., fl., fr. (PDA).

25. *Stemonoporus angustisepalum* Kostermans. — Pl. 25.

*In Liber gratulat. de Wit* : 208 (1980).

— *Stemonoporus cordifolius* Auct. (non ALSTON) ASHTON, in DASSANAYAKE (editor), Revised Handb. Fl. Ceylon 1 (2) : 190 (1977), quoad *Lewis s.n.*, in adnot.

— *Stemonoporus affinis* Auct. (non THWAITES), ASHTON, l.c.

TYPE : *Waas 1608* (PDA).

Tree up to 15 m high with up to 8 mm long bole, up to 25 cm diam. Bark smooth, grey with longitudinal rows of lenticells. Apex of branchlets and the small terminal bud with fugaceous, extremely short rather sparse indumentum. Leaves rigidly coriaceous, glabrous, elliptic, 5-15(-17) × 2-8 cm, shortly, abruptly bluntly acuminate, acumen slender, 4-10 mm long, base rounded ; above bullate to sub-bullate, midrib, lateral and usually secondary nerves impressed ; below paler, midrib strongly prominent, the 8-11 pairs of erect-patent lateral nerves prominent, near the margin arcuate and in the upper half of the lamina often arcuately connected, forming there an intramarginal vein ; secondary nerves prominent, scalariformous, perpendicular to the lateral nerves, reticulation of similar pattern, obscure. Petiole slender or thickish, 2-4.5 cm long.

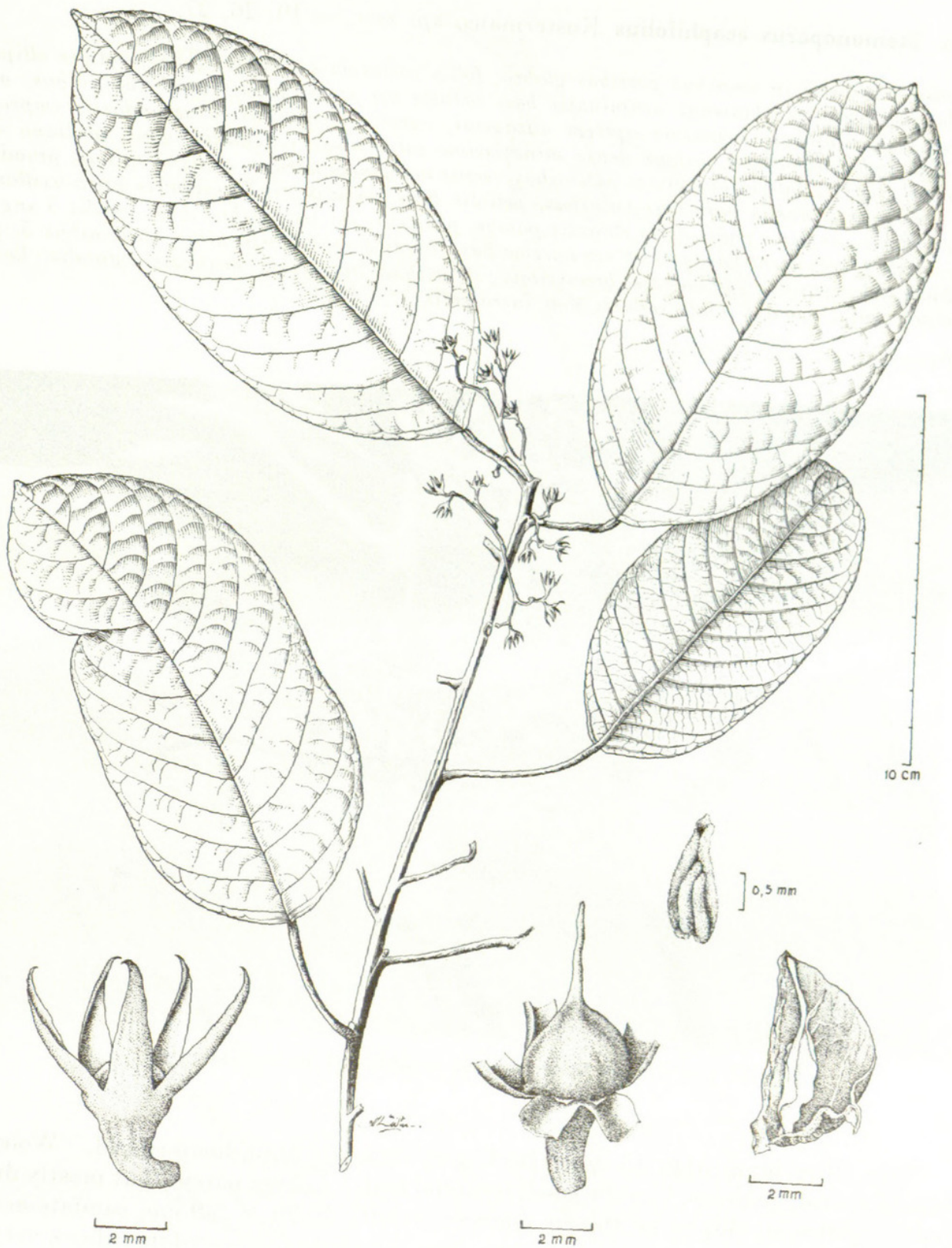
Inflorescences axillary or extra-axillary, paniculate, few-flowered, laxly, extremely minutely puberulous. Pedicels thickish, 2-3 mm long. Sepals narrowly lanceolate, acute, 4 mm long, at base 1.5 mm wide, in sicco rolled up and looking linear, outside sparsely puberulous. Petals yellow, oblong, glabrous, 4 mm long. Stamens 5, 2.5 mm long, obscuring the slightly shorter style. Ovary glabrous.

Fruit globose, 1.5 cm diam., thin-skinned, rusty, roughish (tiny flat scales). Cotyledons not folded.

DISTRIBUTION : Ratnapura and Balangoda Districts, lower montane forest in Adam's Peak jungle.

NOTES : The leaves resemble those of *S. bullatus*, but are much smaller. It has an impressed midrib on the upper leaf surface, and can, apart from the number of stamens (5) easily be distinguished from *S. canaliculatus* and *S. bullatus* by the paniculate inflorescence. Two collections (*Lewis s.n.* and *Waas 1721*) have much smaller leaves (5-8 × 3-4.5 cm) than the other three collections (10-17 × 5.5-7 cm), but otherwise I cannot find any difference.

MATERIAL STUDIED : *Lewis s.n.*, Balangoda Distr., Medde Kande, March, fl. (PDA) ; *Kostermans 24460*, above Balangoda, Tumbagoda Road, Tamanawatte to Masenna, Adam's Peak Jungle, 600 m, June, fr. (G, K, L, PDA, US), distributed as *Aporosa* ; *Waas 1721*, Ratnapura Distr., Malaboda forest, 1800 m, June, fl. (PDA) ; *1580*, Kuttapitiya, 1100 m, June, fl. (PDA) ; *1608*, Agars Land forest, 800 m, May, fl. (PDA).



Pl. 25. — *Stemonoporus angustisepalum* Kostermans.

26. **Stemonoporus scaphifolius** Kostermans, *sp. nov.* — Pl. 26, 27.

*Arbor mediocris in omnibus partibus glabra, foliis coriaceis scaphiformibus pendulis ellipticis vel oblongis, perlonge obtuseque acuminatis basi obtusis vel subcordatis, supra sublævibus, nervo mediano valde impresso acuminis apicem attingenti, nerviis lateralibus et secundariis impressis, foliis hinc inde subbullatis, subtus dense minutissime sat obscure reticulatis, nervo mediano valde prominenti, nerviis lateralibus erecto-patentibus versus marginem abrupte adscendentibus, prominentibus, nerviis secundariis parallelis tenuibus, petiolis bene evolutis; inflorescentiis extra-axillaribus sat paucifloris, anguste paniculatis ramulis paucis, pedicellis sat crassis brevibus, sepalis 5 anguste-triangularibus, persistentibus, petalis vix longioribus, elliptico-spathulatis, albis, staminibus 5, parte apicalibus dehiscentibus, filamentis brevissimis; fructibus immaturis brunneis rotundis, lævibus pericarpio tenui, tepalis valde reflexis non incrassatis.*

TYPUS : Kostermans 28458 (G).



Pl. 26. — **Stemonoporus scaphifolius** Kostermans.

Tree 10 m high, dbh. 15 cm. Bark grey, smooth, thin, hoop-ringed. Wood white. Branchlets stiff, glabrous, like the small terminal bud. Leaves patent, but mostly drooping, concave, glabrous, elliptic or oblong, coriaceous, stiff, 15-25 × 5-9 cm, caudate-acuminate (acumen slender, obtuse, up to 4 cm long), base rounded or sub-cordate; above very glossy, rather smooth, midrib strongly impressed (up to the tip of the acumen), lateral and secondary nerves impressed, making the leaf bullate; below paler, glossy, midrib strongly prominent, lateral nerves slender, prominent, erect-patent, near the margin abruptly arcuately ascen-



Pl. 27. — *Stemonoporus scaphifolius* Kostermans.

dent, 9-12 pairs, secondary nerves thin, parallel (those off the midrib horizontal). Petiole rather slender, 2-4 cm long, slightly thickened apically.

Inflorescences extra-axillary, rather few-flowered, few-branched panicles, up to 4 cm long, glabrous, the lowest branch long, the other very short. Pedicels thickish, 1.5-2 mm long, subtended by a tiny bract. Sepals 5, narrowly elongate triangular, acute, fleshy, stiff, 4-5 mm long. Petals white, elliptic-spathulate, rather fleshy, up to 5 mm long, obtuse. Stamens 5, on very short filaments, opening in the usual way by an apical slanting aperture and one somewhat lower down, formed by the incurved margins of the large valve.

Fruit (immature) rusty brown verruculous because of small polygonal areas, 1.5 cm diam., the unaltered sepals stiff, pointing downwards.

DISTRIBUTION : Only known from the type locality.

NOTES : The 5 stamens places this in subgenus *Monoporandra*. From the other representatives of that subgenus it differs considerably in leaf size, texture and shape. Peculiar are the folded, scaphiform leaves, which occur also in *S. revolutus* (this has obtuse, erect, much smaller leaves). I know only *Vatica scaphifolia* from East Indonesian Borneo with similar strongly concave pendulous leaves. This is the normal situation, the tree was very healthy, the climate very wet.

MATERIAL STUDIED : *Kostermans 28458*, Ratnapura Distr., N. of Bamberabotuwe For. Res., alt. ca. 400 m, May, fl., young fr. (AAU, G, L, PDA).

#### SPECIES EXCLUDENDÆ

1. *Vateria (Stemonoporus) disticha* Thw., Enum. Pl. Zeyl. : 404 (1864) = *Stemonoporus distichus* (Thw.) Heim, Recherches Diptér. : 72 (1892) = *Sunaptea (?) disticha* (Thw.) Trimen = *Doona disticha* (Thw.) Pierre = *Vatica disticha* (Thw.) A. DC. = *Shorea disticha* (Thw.) Ashton.
2. *Vateria (Stemonoporus) scabriuscula* Thw., Enum. Pl. Zeyl. : 404 (1864) = *Stemonoporus scabriusculus* (Thw.) Heim, Recherches Diptér. 89 (1892) = *Vatica scabriuscula* (Thw.) A. DC. = *Sunaptea scabriuscula* (Thw.) Trimen = *Dyerella scabriuscula* (Thw.) Heim = *Cotylelobium scabriusculum* (Thw.) Brandis.
3. *Stemonoporus "roseus"* Trim., Handb. Fl. Ceylon 1 : 136 (1893) ex Durand & Jackson, Index Kewensis Suppl. 1 : 400 (1906) (*sphalm.* = *S. nervosus*). — *Vateria "rosea"* Thw. l.c. (*sphalm.* = *Vateria nervosa* Thw.).
4. *Stemonoporus lewisianus* Trimen ex Hooker f., in Trimen Handb. Fl. Ceylon 5 : 383 (1900) ; Lewis, Trees & fl. Pl. of W. and Sabaragamuwa Prov. 37 (1902) ; Veget. Prod. Ceylon 49 (1934) ; E. J. Livera, in Ann. Roy. Bot. Gard. Peradeniya 9 : 97 (1924) (as a synonym of *Vatica lewisiana*) ; Alston, in Trimen, Handb., l.c. 6 (Suppl.) : 25 (1931) (as a synonym of *Vateria ? lewisiana*) ; Ashton, in Blumea 20 : 358 (1972) and in Dassanayake (editor), Revised Handb. Fl. Ceylon 1 (2) : 167 (1977) (as a synonym of *Cotylelobium lewisianum*). — *Vateria ? lewisiana* (Trimen ex Hooker f.) Alston, l.c. : 25 ; Ashton, ll.cc. (as a synonym of *Cotylelobium lewisianum*). — *Vatica lewisiana* (Trimen ex Hooker f.) Livera, l.c. plate XI C, 1-4 ; Lewis, Veget. Prod., l.c. ; Alston, l.c. (as a synonym of *Vateria ? lewisiana*) ; Ashton, ll.cc. (as a synonym of *Cotylelobium lewisianum*). — Typus : *Lewis s.n.*, Jan. 1893 (K ; PDA, 2 sheets).

Ashton's typification of this species is wrong. Hooker cited the specimen as : Hunawalkande near Pelmadulla, F. C. Lewis, January 1893 (not April 1893, as Ashton says). This is

a specimen in flower (PDA, 2 sheets). The specimen April 1893, not mentioned by HOOKER, is in fruit (PDA, one sheet). In PDA there is moreover a sterile branch with large leaves collected by LEWIS in November 1891.

HOOKER gave the number of stamens as 25, which — according to me — is simply a misprint, as is evident from HOOKER's remark that "if this species is to be retained in the genus *Stemonoporus*, the generic character of the latter must be modified to include a plant with a long subulate process, terminating the anther". The aberrant number of stamens is nowhere mentioned.

LIVERA moved the species to *Vatica* and stated the correct number of stamens (15). He presented the following arguments: 1. Calyx enlarged in the fruit; 2. Stamens not monadelphous (slightly or hardly so in *Stemonoporus*); 3. Anthers dehisce laterally; 4. Connective prolonged to an apiculum.

The most important arguments are the connective appendage (already stressed by HOOKER) and the dehiscence. But LIVERA mentioned also the valvate calyx, an important argument for *Vatica*. The fruit sepals are indeed enlarged, but they are very young and all infested (galls).

ALSTON's discussion must have been written in a moment of aberration. First he says: Stamens 15 in 2 rows. Then in the discussion: Stamens 25. ALSTON's only argument to move it to *Vateria* is that *Vateria* had been suggested by TRIMEN in *mss.*

ASHTON's arguing is also confused. He says: "The previous incorrect placing of this species was partially because of the undue emphasis placed on the value of the characters of the fruit calyx (sic!, the entire system of *Dipterocarpaceæ* is mainly based on calyx characters) and partially because the number of stamens was miscounted as 25 in the original description". The latter can have been only an argument to move it to *Vateria* (ALSTON), who moreover stated also 15 as the number and is certainly not an argument for *Stemonoporus* and *Vatica*. Moreover the move to *Vatica* was based on the correct number (LIVERA). The argument of the valvate sepals, mentioned by LIVERA is not mentioned by ASHTON, who considers this an important character (cf. his Manual of Dipterocarp trees of Brunei).

The shape of the flower, calyx and corolla (petals drop separately), the shape of the anther with appendix, number of stamens, valvate sepals and enlarging fruit sepals point all to *Vatica* and I believe that LIVERA was right, that the species belongs in *Vatica*. It has nothing in common with *Cotylelobium*.

#### COLLECTOR'S NUMBERS

(The collectors' numbers refer to the species numbers)

Ashton 2003 : 6 ; 2007 : 13 ; 2010 : 18 ; 2014 : 17 ; 2038 (2138) : 17 ; 2041 : 4 ; 2046 : 3 ; 2048 : 4 ; 2055 : 20 ; 2056 : 20 ; 2059 : 15 ; 2073 : 2 ; 2092 : 4 ; 2109 : 7 ; 2110 : 7 ; 2111 (2911) : 13 ; 2112 (2912) : 7 ; 2114 : 23 ; 2115 (2915) : 24 ; 2121 : 7 ; 2122 : 7 ; 2123 : 7 ; 2124 : 21 ; 2125 : 10 ; 2126 : 10 ; 2138 (2038) : 17 ; 2139 : 23 ; 2140 : 24 ; 2911 (2111) : 13 ; 2912 (2112) : 7 ; 2915 (2115) : 24.

Bailey s.n., Badulla, C.P. 3474, later 3595 : 21 ; Balakrishnan 179 : 4 ; 343 : 6 ; Balasubramaniam s.n., Kanneliya : 3 ; 179 : 4 ; 2147 : 3 ; 2192 : 20 ; Bernardi 15477 : 3 ; 15788 : 7 ; 15789 : 24 ; 15994 : 23 ; Bremer 940 : 6.

C.P. 371 : 24 ; 1792 : 22 ; 1920 : 7 ; 2430 : 20 ; 2645 : 12 ; 2646 : 13 ; 2647 : 23 ; 2658 : 18 ; 3151 : 14 ; 3412 : 1 ; 3413 : 8 ; 3414 : 11 ; 3415 : 15 ; 3474 (later 3595) : 21 ; 3483 : 9 ; 3595 : 10 ; 3687 : 21 ; 3885 : 1 ; Cramer 3071 : 4.

Davidse & Sumithraarachchi 8742 : 24.

Gunatilleke s.n., Sinharaja : 8 ; B 741 : 11.

Huber 527 : 18 ; 535 : 23 ; 613 : 7 ; 844 : 23.

Jayasuriya & Kostermans 2352 : 4 ; Jayasuriya & Sumithraarachchi 1561 : 13 ; 1572 : 13 ; 1574 : 13.

Kostermans s.n., Sinharaja : 8 ; s.n., Kitulgalle : 6 ; s.n., Moray Estate : 13 ; 24155 : 13 ; 24178 : 13 ; 24259 : 13 ; 24460 : 25 ; 24787 : 13 ; 24933 : 13 ; 24995 : 4 ; 27018 : 7 ; 27051 : 13 ; 27227 : 16 ; 27228 : 15 ; 27234 : 7 ; 27524 : 20 ; 27642 : 3 ; 27650 : 4 ; 27651 : 4 ; 27653 : 4 ; 27654 : 3 ; 27655 : 4 ; 27840 : 11 ; 27856 : 22 ; 27876 : 8 ; 27880 : 22 ; 27898 : 11 ; 27899 : 15 ; 27960 : 13 ; 27961 : 22 ; 28388 : 14 ; 28458 : 26.

Lewis s.n., Weddekande : 25 ; s.n., Kukul Korale : 5 ; s.n., Walankande : 5 ; s.n., Walankande : 17 ; s.n., Ellebodekande : 15 ; Livera s.n., Kiribatgala : 5.

*Meijer* 397 : 15 ; 404 : 16 ; 509 : 24 ; 540 : 4 ; 545 : 3 ; 963 : 23 ; 990 : 4.  
*Nooteboom* 3055 : 20 ; 3393 : 23.  
*Silva* 15 : 20 ; 114 : 18 ; *Sine coll.*, Rangale-Corbet's Gap : 20 ; March 1881 : 8 ; *Sohmer & Waas* 8687 : 7 ; 10435 : 7 ; 10460 : 7.  
*Trimen s.n.*, Maskeliya : 7.  
*Waas* 438 : 17 ; 1479 : 7 ; 1580 : 25 ; 1608 : 25 ; 1688 : 19 ; 1721 : 25 ; 1728 : 23 ; 1730 : 23 ; 1754 : 8 ; 1756 : 21 ; 1770 : 5 ; 1833 : 24 ; 2064 : 10 ; *Worthington* 770 : 23 ; 3232 : 23 ; 6546 : 23.

## ADDENDUM

ASHTON's *Neobalanocarpus* (*Garden's Bull.*, 1981) published as a *nomen novum* to contain *Balanocarpus heimii*, is invalid as the name is not a *nomen novum*, but a *genus novum* and needs moreover a latin description.

After the manuscript was submitted for printing, ASHTON's revision of *Stemonoporus* was reprinted verbatim in DASSANAYAKE (editor), Revised Handb. Fl. Ceylon 1 : 404-418 (1980).

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Kostermans, A. J. G.H. 1981. "Stemonoporus Thw. (Dipterocarpaceæ) : a monograph (part 2)." *Bulletin du Muse*

*um National d'Histoire Naturelle Section B, Adansonia, botanique, phytochimie* 3(4), 373–405.

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