

LOPHOPYXIDACEAE (H. Sleumer, Leyden)

1. LOPHOPYXIS

HOOK. *f. Ic. Pl.* 18 (1887) t. 1714; SLEUM. *Blumea* 16 (1969) 322. — *Combretopsis* K. SCH. in K. Sch. & Hollr. *Fl. Kais. Wilh. Land* (1889) 69. — *Treubia* PIERRE *ex* BOERL. *Handl.* 1, 2 (1890) 445. — Fig. 1.

Scandent or liana-like shrubs or small trees, with interxylary bast elements, watch-spring tendrils (modified leaves or subtending leaves of inflorescences), and umbrella-like branching. *Leaves* spiral, simple, serrulate to crenulate, stipulate. *Flowers* small, regular, monoecious, in glomerules on the branches of loose axillary panicles. *Sepals* 5, valvate, shortly united basally, persistent. *Petals* 5(–6), much smaller than the sepals, free. *Stamens* 5(–6), opposite to the sepals, with filiform filaments and subglobose introrse, almost basifixed anthers, alternating with 5(–6) oppositipetalous cordate glands, these in the ♂ ± adnate to the subtending petal, and in the ♀ ± concrescent into a 5(–6)-lobed disk (the glands or lobes opposite the ovary cells); pollen grains ± ellipsoidal, tricolporate, exine reticulate. *Ovary* superior, conical, shallowly 5-ribbed, 5(–4)-celled, with 5(–4) sessile subulate stigmas; ovules 2 per cell, pendulous, apical, axile, anatropous, epitropous, bitegmic, each surmounted at the micropyle by a small obturator-like appendage coming from the funicle. *Fruit* obovoid or ellipsoid, indehiscent, fusiform, 1-locular, 1-seeded, with 5 broad stramineous wings. *Seed* oblong, with endosperm; embryo erect, with oblong cotyledons and a short erect radicle.

Distribution. Monotypic, in *Malesia*, Melanesia, and Micronesia. Fig. 2.

Anatomy. Stem. Anomalous secondary growth: ENGLER, *Sitz. Ber. Preuss. Ak. Wiss. Berl.* 18 (1893) 265–266; HANDA, *Bot. Mag. Tokyo* 54 (1940) 41–47; PFEIFFER, *Rev. Sudam. Bot.* 10 (1951) 3–6; SLEUMER in E. & P. *Nat. Pfl. Fam. ed.* 2, 20b (1942) 393, f. 118.

The young stem has five ribs with a continuous xylem cylinder enclosing a pentagonal pith with a central portion of thick-walled parenchyma cells and a marginal area of thin-walled cells, erroneously referred to by ENGLER (*l.c.*) as intraxylary phloem. This thin-walled tissue may become caducous, at least in herbarium specimens. Between the ribs the secondary xylem has numerous vessels; in the ribs the vessels are narrower and scarcer. Vessel perforations are simple. Through anomalous activity of the cambium, 5 phloem strands become enclosed within xylem in the young shoot. Later interxylary phloem is formed as continuous bands alternating with secondary xylem. The phloem is stratified into soft and fibrous portions. Axial xylem parenchyma is scarce and paratracheal (only seen in young twigs). The ground tissue of the xylem is composed of fibres with numerous minutely bordered pits. Rays vary from 1–6-seriate in the young stem. The outer phloem is surrounded by a cylinder of fibres and stone cells. Cork arises in the layer below the epidermis.

The anatomy of the leaf has hitherto never been described. The petiole shows a strongly incurved arc of separate vascular bundles and two additional latero-dorsal bundles as seen in transverse section through the distal end. The vascular system forms a closed flattened cylinder in the midrib. The stomata, confined to the abaxial surface, are paracytic. Crystals are present as solitary rhomboids and clusters. The hairs are unicellular.

To evaluate the taxonomic significance of the vegetative anatomy of *Lophopyxis* with regard to the affinities of the genus more research is still needed. The only straightforward conclusion to be drawn at present is that *Lophopyxis* is anatomically entirely different from *Gouania* (*Rhamnaceae*), to which AIRY SHAW (in Willis *Dict. ed.* 7, 1966, 668) related it. *Gouania* differs *e.g.* in having anomocytic stomata, styloids, un lignified perivascular fibres and exclusively narrow rays. Dr. C. R. METCALFE (Kew) kindly put slides and anatomical information of *Lophopyxis* and *Gouania* at my disposal. — P. BAAS.

Taxonomy. This genus was tentatively ascribed to the *Euphorbiaceae* by HOOKER *f.*, but removed from this family by PAX (1890). ENGLER (1893) accommodated it as a distinct subfamily *Lophopyxidoideae* within *Icacinaeae*, from which I rejected it in 1942. HUTCHINSON (*Fam. Flow. Pl.* 1959) placed it in the *Celastraceae*.

Its gross morphology, wood anatomy, embryology and pollen morphology is well known and it is

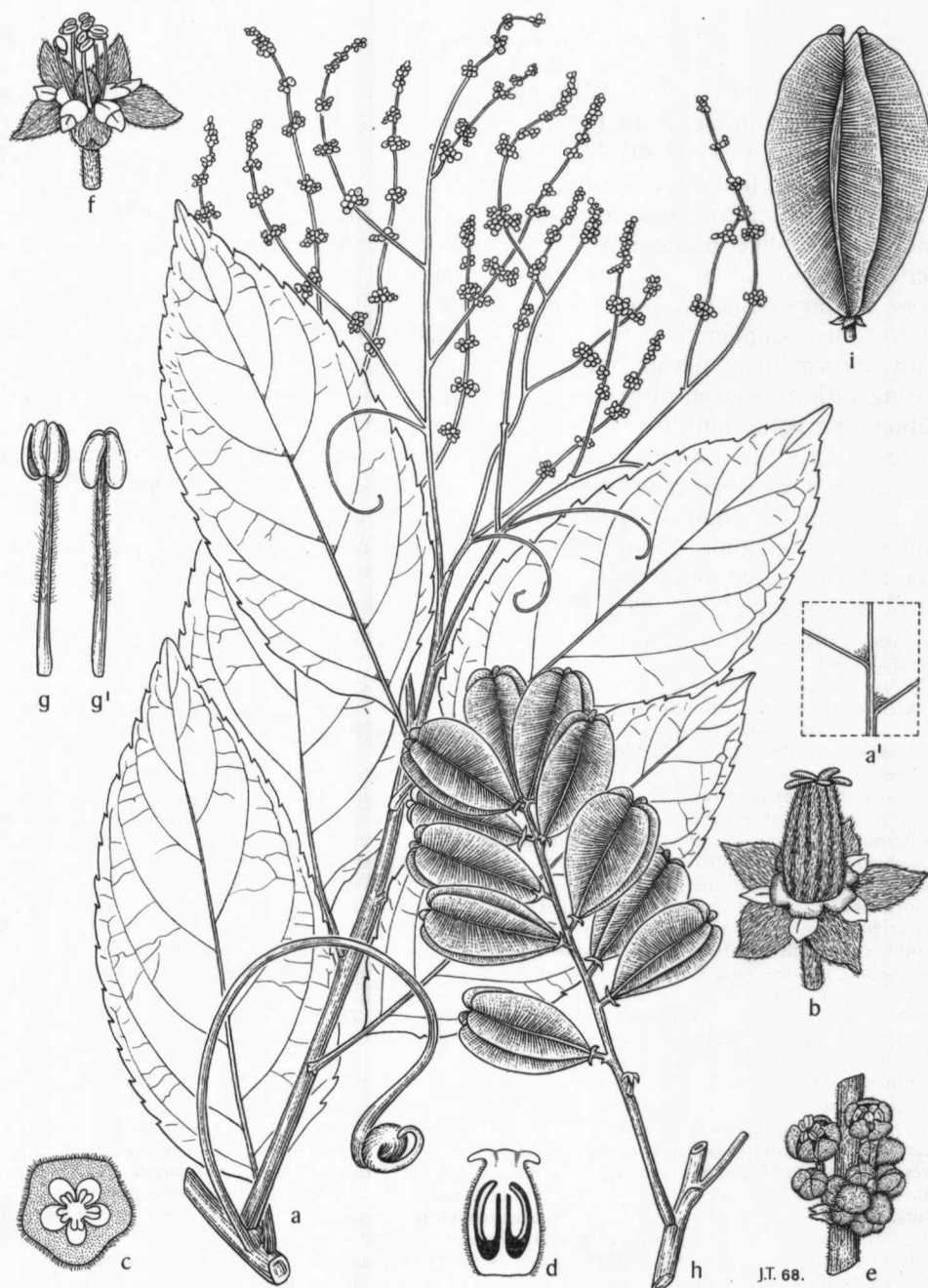


Fig. 1. *Lophopyxis maingayi* HOOK. *f. a.* Habit, $\times \frac{1}{2}$, *a'*. showing domatia in the axils of lateral nerves, $\times 2\frac{1}{2}$, *b.* ♀ flower, $\times 7$, *c.* ovary, cross-section, $\times 7$, *d.* ovary, longit. section, $\times 7$, *e.* ♂ flower buds, $\times 2\frac{1}{2}$, *f.* ♂ flower, $\times 5$, *g.* stamen, front view, $\times 15$, *g'*. stamen, back view, $\times 15$, *h.* infructescence, $\times \frac{3}{8}$, *i.* fruit, $\times \frac{1}{8}$, (*a-d, h-i* KANEHIRA (1938), partly altered, *e-g* SLEUMER (1942)).

now apparent that it should be placed within the *Geraniales-Sapindales-Celastrales*. It seems, however, that it does not fit in any of the established families of these orders. Its relation to *Rhamnaceae*, suggested by SHAW (1966) rests on a superficial habit similarity with *Gouania*, as shown by BAKHUIZEN & VAN STEENIS, Fl. Mal. Bull. 21 (1966) 1426 (see also *sub Anatomy*).

The best solution is to regard it as the type of a family of its own, as has been casually proposed by VAN TIEGHEM (1897) and PIERRE (1897), and formally by PFEIFFER (1951). I have this more fully explained in my precursory paper in *Blumea* 16 (1969) 320.

1. *Lophopyxis maingayi* Hook. f. Ic. Pl. 18 (1887) t. 1714; Fl. Br. Ind. 5 (1888) 673; PAX in E. & P. Nat. Pfl. Fam. III, 5 (1890) 117; ENGL. *ibid.* (1893) 238, 257; HALL. f. Med. Rijksherb. 1 (1910) 9; RIDL. Fl. Mal. Pen. 1 (1922) 435; SLOOR. Bull. Jard. Bot. Btzg III, 7 (1925) 364; HOLTH. & H. J. LAM, *Blumea* 5 (1942) 205, f. 7; SLEUM. in E. & P. Nat. Pfl. Fam. ed. 2, 20b (1942) 393; Fl. Males. I, 5 (1954) 63; *Blumea* 16 (1969) 322, with extensive bibliogr. — *Combretopsis pentaptera* K. SCH. in K. Sch. & Hollr. Fl. Kais. Wilh. Land (1889) 69. — *Treubia combretocarpa* PIERRE ex BOERL. Handl. 1, 2 (1890) 445. — *L. pierrei* BOERL. l.c. 673, *nom. ill.*; HEYNE, Nutt. Pl. 1 (1950) 987. — *L. schumannii* BOERL. Handl. 1, 2 (1890) 674, *nom. ill.* — *L. combretocarpa* (BOERL.) ENGL. in E. & P. Nat. Pfl. Fam. III, 5 (1893) 257. — *L. pentaptera* (K. SCH.) ENGL. Sitz. Ber. Kön. Preuss. Ak. Wiss. (1893) 265, t. 2, f. 6 & 7; SLEUM. in E. & P. Nat. Pfl. Fam. ed. 2, 20b (1942) 393, f. 117 (habit) & 118 (wood anat., embryol.); DAHL, J. Arn. Arb. 36 (1955) 160, 161 f. 2 & 2A (pollen); PEEKEL, Fl. Bismarck Arch. MS p. 1083, fig. — *Homalium gilgianum* LAUT. in K. Sch. & Laut. Nachtr. (1905) 320. — *Sinapistrum* RUMPH. Herb. Amb. 5 (1747) 73, t. 39, f. 1. — Fig. 1.

Vigorous woody vine or climbing shrub, 3–8(–30) m; stem up to 7 cm \varnothing , bark whitish. Branches virgate, youngest parts longitudinally grooved, with elliptic lenticels in the grooves, puberulent. Leaves ovate to oblong, apex \pm acuminate, acutish, base cuneate to obtuse, rarely rounded or subcordate, subequal, chartaceous to subcoriaceous, caducous-puberulous especially at the nerves beneath, the hairs persisting in the nerve axils as domatia, serrulate-crenulate or crenate, sometimes subentire, 8–18(–24) by 4–8(–10) cm, nerves 1(–2) basal or slightly supra-basal, and 3–4 upper pairs, all arched and steeply ascending, veins and veinlets densely reticulate, slender but prominent on both faces; petiole c. 10 by 1 mm. Stipules small, knob-like. Axillary branchlets metamorphosed into strong woody tendrils coiled only at the end, often bearing a bud. Panicles loose, composed of a few axillary or terminal spike-like racemes, pendent, puberulous, 10–25 cm. Flowers solitary, or mostly crowded into glomerules, these spaced along the slender to filiform rachis. Pedicels very slender, up to 2 mm. Bract at the base of the inflorescences often metamorphosed into a weak flat completely coiled tendril. Sepals ovate, greenish white or yellowish, hairy on both sides, c. 1.5 mm. Petals ovate, thin,

c. 1 mm. Disk yellowish. — δ Flowers: filaments hairy, 2 mm; anthers subglobose, 0.5 mm; rudiment of ovary subglobose, shallowly 5-ribbed, hairy. — φ Flowers: ovary ovoid, whitish-yellowish puberulent, 2 mm. Capsule obovoid-ellipsoid in outline, 5-winged, green, later dark brown, caducous-pubescent, 2.2–3(–3.5) by 1.3–1.8 cm; wings chartaceous, 5–8 mm wide, with irregularly crenulate margin; pedicel short, subtended by the non-acrescent calyx. Seed 1, subcylindrical, acuminate, lengthwise grooved, 12–15 by 5–6 mm.

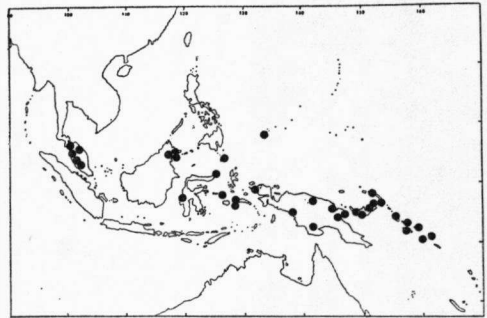


Fig. 2. Distribution of *Lophopyxis maingayi* Hook. f.

Distr. Micronesia (Palau Is.), Melanesia (New Ireland, Duke of York I., New Britain, Solomon Is.), in *Malesia*: Malay Peninsula (Penang to Malacca), North Borneo, W. Central and N. Celebes, Moluccas (Talaud Is., Ceram, Sula Is., Ambon), New Guinea. Fig. 2.

Ecol. Straggling climber in canopy or edge of primary lowland forest, both in well drained and in swampy riverine forest, in littoral forest and even sometimes in the mangrove, also in disturbed gully forest or forest regrowths, seaside scrub; scattered, though locally not too rare, from sea-level up to c. 300 m, often on alluvial soil.

Uses. The rather hard stem splits easily into pieces, and apparently for this reason is used in New Britain for tying thatch. RUMPHIUS under his '*Sinapistrum*' says, that crumpled leaves give a strong smell of mustard, and are used to cure ulcers.

Vern. *Akar b'limbing hutan*, Brunei (Kinabatangan), *simpuru*, Celebes, *taburuh*, Talaud, *tali sasawi*, Ambon (*sec.* RUMPHIUS).