

MORINGACEAE (C. G. G. J. van Steenis, Buitenzorg)

1, MORINGA

Juss. Gen. (1789) 348; Endl. Gen. Pl. (1840) no 6811, p. 1321; B. & H. Gen. Pl. 1 (1862) 430; E. & P. 3, 2 (1891) 244.

Small trees, mostly deciduous, bark gummy, wood soft, roots thickened, pungent; trunk often inflated. *Leaves* spread, imperfectly 2-4-imparipinnate; tissue with myrosin cells; pinnae opposite, provided with stipitate glands at the base of the petiolules and pinnae. Leaflets small, opposite, entire, all articulated. Stipules represented by blunt knobs. *Flowers* bisexual, zygomorphic, white (or yellow streaked red), in axillary panicles. Calyx tube short, as a hypanthium; lobes 5 imbricate, spreading or reflexed, separately dropping. Petals 5 free, anterior one largest and erect, others reflexed, posterior smallest. Disk lining the calyx tube, with a short free margin bearing the androecium. Perfect stamens 5 epipetalous; anthers dorsifixed, 1-celled, oblong, when lengthwise opened broader. Staminodes 5, subulate, with or without rudimentary anthers. Ovary superior, shortly stalked, 1-celled with 3 parietal placentas. Style filiform, stigma small. Ovules ∞ , in 2 series on each placenta. *Capsule* linear, beaked, 3-6-angled; valves thick, spongy, on the inside with pitted cavities in 1 row along the median line. Seeds 3-winged (or exalate), body roundish large. Embryo exalbuminous, straight, containing oil.

Distr. *Ca* 10 spp., confined to the semi-arid countries of Somaliland, Madagascar, SW. Africa, NE. Africa, Asia Minor, 2 spp. in India.

Ecol. Said to be deciduous, but *M. oleifera* is to my knowledge in Malaysia never wholly so, thriving both under wet and seasonal conditions. As far as is known *M. oleifera* never runs wild.

Uses. Numerous uses, cf. under *M. oleifera*.

Notes. Very different opinions have been advanced on the affinity of *Moringa*. DALZELL arranged it with the *Bignoniaceae*; even recently HALLIER f. (Rec. Trav. Bot. Néerl. 15 (1918) 60, 99) followed BENTHAM, MIQUEL and others in assigning *Moringa* to the *Leguminosae* as a syncarpous remote member; GRIFFITH, however, had already predicted (Posth. Pap. 2 (1839) p. xiv, 1849) that polycarpous *Leguminosae* should be apocarpous (as now described in *Archidendron* &c.). The genus is now universally adopted as allied to the *Capparidaceae*. In Malaysia one species occurs, only cultivated.

1. *Moringa oleifera* LAMK, Encycl. 1 (1785) 398; —*Morunga* RUMPH. Herb. Amb. 1 (1741) 184 t. 74/5.—*Gulandina moringa* LINNÉ, Sp. Pl. 1 (1753) 381; HORSF. Verh. Bat. Gen. 8 (1816) 107.—*Hyperranthera moringa* VAHL, Symb. bot. 1 (1790) 30; THUNB. Fl. Jav. (1825) 19; JUEL, Pl. Thunb. (1918) 248.—*M. pterygosperma* GAERTN. Fruct. 2 (1791) 314; HASSK. Pl. Jav. Rar. (1848) 413; MIQ. Fl. Ind. Bat. 1, 1 (1855) 350; Suppl. (1860) 115; GRESH. Schetsen (1895) 63, t. 17.—*M. nux-ben* PERROTTET, Mém. Soc. Linn. Paris 3 (1824) 129; C. B. ROB. Philip. J.Sc. 3 (1908) Bot. 305.—*M. polygona* DC. Prod. 2 (1825) 478; MIQ. Fl. Ind. Bat. 1, 1 (1855) 350, Suppl. (1860) 115.—Fig. 1.

Rapid-growing often crooked tree 3-10 m, stem 10-30 cm diam., crown thin, bark with coarse fibre. *Leaves* somewhat crowded towards the twig-ends; twigs lenticellate, with distinct scars; innovations pubescent. Petiole thickened at the base incl. the rachis 25-60 cm, all stalks articulated hence caducous, provided with linear or clavate often curved glands; jugae 8-10. Petiolules 1-6 mm, blades ovate, obovate or oblong, 9-20(-30) by 5-12(-18) mm, tip rounded or slightly emarginate, lower surface pale green, nerves obscure not prominent. Panicles erect, 10-30 cm; bracts small. *Flowers*

white with greenish base, fragrant; pedicels 7-11 mm, articulated under their tip. Calyx tube 3-4 mm high; posterior sepal 7-10, anterior 10-14 mm long. Petals hairy towards the base, anterior one 14-17 by 6-8 mm, posterior ones 10-13 by 5-8 mm. Stamens and staminodes with hairy base, directed to the largest petals, apex of the filaments recurved. Gynophore 2-3 mm. Ovary 3-4 mm high, densely hairy; style upwards glabrous with hollow stigma. *Capsule* pendent, dagger-shaped, subtorulose, 18-45 cm long, valves with 3 strong blunt ribs. Seeds 10 mm diam., wings 25 by 4-7 mm, subsequent ones partly overlapping; testa reticulate.

Distr. Indigenous in NW. India, in *Malaysia* introduced at an early date, now planted throughout the settled areas in all tropics, not run wild, sometimes found as a culture relic in abandoned places, up to ca 500 m.

Ecol. Flowers throughout the year, fr. mostly Sept.-Nov. Exclusively propagated by cuttings. Germination hypogaic. Colibris, and in India honeysuckers, are reported to visit the flowers. Once coralloid twig-galls 10-30 cm diam. were found in W. Java. Damage of the stem by insects causes quick exudation of gum.

Vern. *Horse radish tree* (Engl.), *kèlor*, J, M, Md,

maronghi, Md, *marunga* (Timor), *k(o)lèntang* (fruct.), *malungay*, Tag. Philip., *gemunggai*, *meringai* (Mal. Pen.), and many others.

Uses. Many: flowers, leaves and immature fruits as vegetable. Leaves and bark (specially of the roots) medicinal. Bark-gum and seed-oil not

valuable. Treelet sometimes used for living fences or as supporting tree for pepper vines (cf. RUMPHIUS, GRESHOFF, HEYNE, BURKILL, &c.).

Wood anat. *M. sp.*: MOLL & JANSSONIUS Mikr. Holzes 2 (1908) 513; *M. oleifera*: TANG, Bull. Fan Mem. Inst. of Biol. 6 (1935) 153. Both microsc.



Fig. 1. *Moringa oleifera* LAMK, $\times \frac{1}{3}$.