

KOSTERMANSIA SOEGENG
A NEW GENUS IN BGMBACACEAE (Durioneae)*

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INTRODUCTION.

In working up the genus *Coelostegia*, I received on loan from the Forest Research Institute at Kepong, Malaya abundant material of a species which Wyatt-Smith was unable to place. Dr. Kostermans pointed out to me that most likely the specimens belonged to a new genus, related to *Coelostegia*. I have taken the liberty to name the genus after Dr. A. J. G. H. Kostermans, who has been devoting time and energy teaching me taxonomy, and who has taken up the burden of the development of taxonomic botany in Indonesia.

I am indebted to Prof. Dr. C. G. G. J. van Steenis and to Dr. R. G. Bakhuizen van den Brink Jr., who have kindly helped me in preparing the Latin diagnoses.

Kostermansia Soegeng, gen. nov.

Genus novum e tribu Durionis, ex affinitate Durionis et Coelostegiae. A Durione differt: epicalyx alabastrum pro parte tantum obtegens; petala parva caduca; stamina ovario breviora; stigma peltatum magnum subsessile; fructus valvis basi connatis instructus; cotyledones tenues foliacei endospermio tenui vestiti. A Coelostegia differt: epicalyx maior; sepala reflexa non-saccate, non-septata; petala libera; stamina breviora; stigma subsessile; fructus valvis septo tenui munitis instructus; semina exarillata.

The genus is closely related to *Durio* and *Coelostegia*, but different in morphological characters as shown below:

Durio	Kostermansia	Coelostegia
1. Lower leaf surface covered by stellate hairs as well as scales.	1. Lower leaf surface covered by scales only.	1. Same as in <i>Kostermansia</i> .
2. Epicalyx completely enveloping the bud.	2. Epicalyx partly enveloping the bud.	2. Epicalyx reduced, subtending the calyx.

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** Ass. Botanist, Herbarium Bogoriense, Bogor.

Durio	Kostermansia	Coelostegia
3. Calyx-lobes valvate.	3. Same as in Durio, non-saccate.	3. Calyx lobes induplicate, saccate.
4. Corolla mostly conspicuous, more or less showy, longer than the calyx, free, rather long persistent, hypogynous.	4. Corolla shorter than the calyx, not showy, free, soon deciduous, hypogynous.	4. Corolla shorter than the calyx, calyptrate, perigynous.
5. Stamens always longer than the ovary.	5. Stamens shorter than the ovary.	5. Stamens longer than the ovary.
6. Ovary superior.	6. Ovary superior.	6. Ovary partly embedded in the receptacle.
7. Style well developed.	7. Style reduced, or very short, thick.	7. Style conspicuous, filiform.
8. Stigma small, capitellate.	8. Stigma large, convex, discoid, peltate.	8. Stigma discoid, peltate, conspicuous.
9. Fruit-valves at last free.	9. Fruit-valves connate at base, recurved.	9. Fruit-valves connate at base, erect.
10. Seeds mostly arillate.	10. Seeds exarillate.	10. Seeds carunculate.
11. Cotyledons thick, flat-convex; endosperm absent.	11. Cotyledons foliaceous, flat, covered by 2 parts of endosperm.	11. Cotyledons as in Kostermansia.

Kostermansia malayana Soengeng, *spec. nov.*—Fig. 1—4.

Arbor magnet, basi cum rhizomate tabulari giganteo; folia alterna coriacea rigida elliptica ovato-elliptica vel oblonga, supra fere glabra, subtus lepidota. Inflorescentiae axillares laxae; flores lepidoti; pedicelli longissimi; epicalyx ante anthesi cupuliformis, alabastrum in parte basali obtegens; sepala reflexa longa; petala erecta caduca sepalis minora; stamina ovario breviora; filamenta basi connata; ovarium superius globosum lepidotum; stigma subsessile peltatum magnum; fructus globosus multispinosus 5-valvatus valvis lignosis reflexis basi connatis non-caducis; semina exarillata; cotyledones plani; endospermium fere ad basin bilobum, lobis cotyledonibus similibus et eos obtegentibus.

Typus —Kep. 61085 (KEP); Para-typus — Kep. 61071 (KEP).

Tall tree, up to 50 m; bole often fluted, up to 1 m in diameter above the buttresses. Buttresses enormous, up to 7 m high, spreading, plank-like.

Bark either more or less smooth, lenticellate, or rough, scaly, thin, dark brown, sometimes peeling off, leaving red-brown spots. Living bark c. 1 cm thick, fibrous, red, shading to orange at cambium, breaking into distinct layers. Sapwood pale, heartwood light red. Branchlets terete, slender, with long (c. 3 cm) internodes, with circular stipule-scars, densely covered by dull, pale brown, adpressed, toothed scales.

Leaves alternate, rigid-coriaceous, penninerved, ovate or elliptic, rarely oblong, (6—) 9—13 (—19) cm by (2—) 4—6 (—9.5) cm, apex acute to acuminate, in the latter case the acumen up to 1 cm long, pointed, sometimes the apex obtuse or apiculate, base rounded, rarely slightly contracted into petiole; upper surface smooth, opaque, usually dark brown or grey-black when dried (the fallen leaves glossy red above), glabrous (except along the midrib), midrib channelled, often covered with minute, loose, stellate hairs or long-fimbriate scales, lateral nerves obscure, reticulation invisible; lower surface densely covered by adpressed, dull greyish-brown, fimbriate scales of various sizes (those of the lowest layer smaller, the largest ones (c. 0.1 mm) at the top layer), midrib strongly prominent, more or less angular, tapering towards apex, densely lepidote, lateral nerves 11—16 pairs, hardly prominent, near the margin becoming fainter, arcuate and anastomosing, reticulation invisible. Petioles 1.5—2 cm long (rarely up to 2.5 cm), thick, gradually slightly thickened towards apex, sulcate when dried, distinctly grooved above, densely lepidote. The apical and axillary leaf-buds enveloped each by 2 cone-shaped, lepidote stipules, soon caducous and leaving oblique circular scars.

Inflorescences lax, densely lepidote, axillary or pseudoterminal, peduncle greatly varying in length from almost absent to up to 7 cm long, simple or hardly branched, pedicel slender, 1.5—3 cm long. Flower-buds ovoid, 4.5 mm long, 3.5 mm in diameter. Epicalyx enveloping the basal part of the bud, usually soon deciduous, consisting of 2 ovate, acute, concave lobes, 3 mm long, 2.5 mm wide, which are connate at base; outside densely lepidote, inside densely covered with minute, silvery, stellate hairs. Calyx of 5 valvate, rigid-coriaceous, ovate-lanceolate, concave sepals, 6 x 2.5 mm, acute, first erect, later reflexed, which are connate at base; outside densely covered with large (c. 0.1 mm), yellowish-brown, fimbriate scales, inside papillose but for the base, which is densely covered by small, pale brown, fimbriate scales and apices which are pilose. Corolla imbricate, cone-shaped in bud, of 5, thinly papery, ovate, acute petals, 4.5 x 2 mm, truncate at base; outside densely covered by scales similar to those of the calyx, but paler, -inside at upper part covered with minute, whitish stellate hairs, the remainder glabrous. Petals at anthesis free, soon deciduous. Stamens about 20, the filaments flattened, of different length, 1.75—2.5 mm, connate at base, forming a short tube (c. 1 mm), splitting at different heights, each filament topped by 2 bean-shaped, basifixed, 2-celled anthers, which dehisce laterally by a longitudinal slit. Ovary globose, 4 mm in diameter, 5-sulcate, with numerous angular spines, each topped by a large peltate scale similar to that of the petals, 5-loculed; each locule with 2 obovoid, monoseriate, axillary, subhori-

zontally attached ovules. Stigma large, peltate, convex, discoid, 1.5 mm in diameter, subsessile, (or a very short and thick, lepidote style), below densely clothed with minute stellate hairs. Fruit globose, c. 5—6 cm in diameter, greenish grey, dehiscent (except base) while still attached on the branches into 5 completely recurved valves; valves elliptic, up to 7 cm long, greatest width 3 cm, pointed at apex, consisting of 2 layers: the inner woody layer, 2—3 mm, at apex hooked upwards, with an outer fibrous palisade layer of spines, 3—4 mm thick; inside smooth with thin, subcoriaceous, shredded width 3 cm, pointed at apex, consisting of 2 layers; the inner woody layer, septae (fleshy when fresh); outside with numerous angular, pointed spines of 1 cm long, 3—4 mm diameter at base (spines scarcely pungent, the tips being easily bent), densely covered with small, dull, greyish brown, fimbriate scales. Fruit-stalk cylindrical, 4 - 7 cm long, finely wavyly fissured, densely lepidote. Seeds exarillate, glossy, dark-brown (white when still fresh), somewhat flattened, obovoid-ellipsoid, c. 2.5 x 1.5 cm, with very rigid leathery testa; cotyledons flat, foliaceous, covered by 2 flatyconvex parts of endosperm.

Seedling of c. 30 cm height with 2 opposite, persistent, glabrous, coriaceous, broadly-obovate cotyledons, up to 8.5 cm long, 6.5 cm at the widest part, apex rounded or truncate, base emarginate, with flattened petiole, 5—7 mm long, 2.5 mm broad. Usually 5 nerves start from the apex of the petiole, viz. the midrib and 2 pairs of lateral nerves; on the upper surface the nervation is clearer than on the lower; leaves oblong-obovate, 10—14 x 4—5 cm, apex acuminate, acumen up to 1.2 mm long, pointed, base gradually contracted into petiole; stipules opposite, soon deciduous, lanceolate, 1 cm long, folded, densely lepidote.

Vernacular names. — Krepal or Krepau (Johore); Durian tuang or Durian tong (Perak).

Distribution. — Malay Peninsula.

Comer in his *Wayside Trees of Malaya* 1 : 437. 1940 (ed. 1) and 1952 (ed. 2), writes that there are abundant specimens in Johore of a tree called "Krepal" or "Krepau" which he referred to an unnamed species of *Coelostegia*; furthermore that it has many characters in common with *Durio*, so that it seems to be intermediate between the two. In 1932 he collected and identified the specimens S.F.N. 26060 as *Durio singaporensis* Ridley, later he referred the specimens S.F.N. 34673 and S.F.N. 37100 to an undescribed species. Wyatt-Smith was puzzled by these specimens and identified them as a *Coelostegia* spec.

Kostermans misidentified the specimen Kep. 26060 (in Comm. For. Res. Inst. Indonesia 62: 10. 1958) as *Durio singaporensis* Ridley; he was however, well aware that this specimen was rather aberrant. Bakhuizen v.d. Brink misidentified the same specimen as *Durio carinatus* Mast.

Specimens from Johore differ slightly from those of Perak in their leaves; Corner. S.F.N. 37100 has flowers with persistent epicalyx, a slightly longer style, the base of the calyx inside, besides the scales also with stellate hairs along the margin. The specimen Kep. 71313 bears old inflorescences of *Durio carinatus* Mast.; Wyatt-Smith stated on the label that something was wrong in preparing the specimen.

MALAYA. S. Perak, Bikan For. Res. Compt. 7, alt. c. 30 m, Oct., seedling-, *Symington*, Kep. 47303 (KEP); *ibid.*, June, seedling, *Embi bin Mohd. Noor*, Kep. 61080 (KEP); *ibid.*, Aug., fl., *Ismail bin Mat All*, Kep. 61085 (KEP), type!; *ibid.*, Oct., fl., *Ismail bin Mat AH*, Kep. 61086 (KEP); *ibid.*, March, fr., Kep. 61071 (KEP), para-type!; *ibid.*, Aug., fr., seedling, *Kep. s.n.* (KEP). Johore. Ulu Tiram, Sept., fr., *Corner*, S.F.N. 26060 (BO, KEP, SING); Kota Tinggi, Mawai Road, low alt., Febr., ster., *Corner*, S.F.N. 34673 (A, B, BM, BO, DD, E, K, L, SING); Mawai - Jemaluang Road, May, fl., *Corner*, S.F.N. 37100 (KEP, SING); Near Mawai, March, fl., (July, fr.), *Corner* S.F.N. 26998 (= 37111) (SING); S. Sedili, May, ster., *Corner s.n.* (SING); Sungai Kayu, Oct., ster., *Kiah s.n.* (SING). S e l a n g o r, Sungai Lalang, Kajang, March, ster., *Symington* 22805 (SING); *ibid.*; Apr., ster., *Symington* 24158 (SING); Mersing, Bukit Arang For. Res. Compt. 10, Oct., ster., *Wyatt Smith Kep. 71313* (KEP), p.p. (excl. the old inflorescences).



Fig. 1. — *Kostermansia malayana* Soeng, flowering branch (after Kep. 61085, holo-type, X 0.5).



Fig. 2. — *Kostermansia malayana* Soengeng, old fruit, seed, seeds without testa, showing endosperm and cotyledons (X 0.5).



Fig. 3. — *Kostermansia malayana* Soegeng, flowerbud, flowers ($\times 5$); ovary in cross-section ($\times 7.5$); stamen ($\times 10$).



Fig. 4. — *Kostermansia malayana* Soengeng, seedling (x 0.5).