

very similar in the field but is probably not closely related, as the rachillae are much more robust and in structure and armature quite different.

In Sabah, leaflet width seems to be quite variable; though most of the populations have rather broad leaflets, in some they are narrow; leaf sheath armature is also variable particularly between juvenile and adult climbing individuals.

The cane produced by this species is of quite good quality, fitting in the same size class as 'rotan sega' (*Calamus caesius*).

11. ***Calamus malawaliensis*** J. Dransf. sp. nov. ad sectionem *Phyllanthectum* pertinens hic palmijuncus gracillimus *C. microsphaerion* affinis sed vaginis foliorum sparsissime lepidotis, inflorescentia minuta, rachillis brevissimis, fructu squamis convexis nitentibus in ordinibus 13 verticalibus dispositis vice planis impolitibus in ordinibus 17–18 differt. Typus: Borneo, Sabah, *Phillipps & Dewol* SAN 89981 (holotypus SAN).

Very slender rattan with stems climbing to 7 cm; stem without sheaths to 4 mm diam., with sheaths to 7 mm; internodes to 11 cm. Leaf sheaths drying very pale bluish-green, with very sparse fugacious grey scales and armed with abundant short black-tipped spines to 5 mm with conspicuously swollen bases, the bases drying slightly paler than the body of the sheaths. Knee poorly developed, slightly swollen, inconspicuous. Ocrea membranous, unarmed, inconspicuous, to 1 mm. Leaf cirrate to 76 cm including the petiole to 18 cm and cirrus to 18 cm; petiole semi-circular in cross-section c. 3 × 2 mm, sparsely armed with the scattered black-tipped spines with pale bulbous bases; leaflets about 10 on each side of the rachis arranged irregularly in different planes in groups, for example, two followed by three followed by two followed by one followed by one, the groups about 8 cm distant; longest leaflets proximal, to 16 × 1.5 cm; mid-leaf leaflets to 13 × 1.1 cm, apical leaflets to 10 × 0.6 cm; leaflet drying pale bluish-green, unarmed; transverse veinlets short, invisible on abaxial surface, prominent on adaxial surface. Almost mature infructescence, only, known; erect, to 22 cm, unarmed throughout; prophyll to c. 4 cm, closely tubular; other primary bracts three in number, decreasing in size towards the apex of the infructescence; partial inflorescences four, c. 5 cm distant to 5 cm long; rachillae borne on the partial inflorescence, to 1 cm long; rachilla bract tightly sheathing c. 1 mm long with a very short triangular keeled point; involucrophore c. 0.5 mm high, with a mouth c. 1.5 mm wide and two minute points; involucre c. 0.5 mm high with a mouth c. 1.5 mm wide and bearing an oval cushion c. 0.7 × 0.3 mm, with the scar of attachment of the sterile staminate flower. Fruiting calyx tubular in basal 1.2 mm and with three explanate irregularly split sepals to 0.7 × 1.3 mm; corolla with three triangular petals to 2 × 1.2 mm. ± Mature fruit sphaerical, c. 7 mm diam., tipped with a beak to 0.8 × 0.8 mm, and covered in 13 vertical rows of convex, shiny straw-coloured scales with dark brown margins. Seeds two in each fruit (? always), hemisphaerical, c. 4 mm diam.; endosperm homogeneous, embryo on the flat face. Seedling leaf unknown.

SABAH. Kudat District, Malawali Is., *Phillipps & Dewol* SAN89981 (holotype SAN), and SAN89969 (SAN).

This extraordinarily slender rattan seems most closely related to *C. microsphaerion* Becc. It differs in the very small inflorescence with very short rachil-

lae, and the fruit with convex shiny scales in 13 vertical rows; *C. microsphaerion* in Sabah has fruit with \pm flat dull smaller scales in 17–18 vertical rows. The present species appears to have two seeds per fruit—they are like very small lentils, and must represent one of the smallest seeds in the genus; it is not known whether two seeds are always present. The variation in *C. microsphaerion* is not yet completely understood so it may seem premature to describe the present taxon as new; however the fruit and leaf sheaths appear very different when closely compared with those of *C. microsphaerion*.

12. ***Calamus laevigatus* Mart. var. *serpentinus* J. Dransf. var. nov.** a varietate typica colore viride-cinnamomeo, petiolo brevi, foliolis non reflexis, habitu saepe caespitoso, squamis fructus porphyreis differt. Typus: Borneo, Sabah, *Dransfield* JD5789 (holotypus K; isotypus SAN).

Solitary or clustering rather slender rattan with stems climbing to 10 m. Stem without sheaths c. 6 mm diam., with sheaths to 13 mm diam., internodes to 10 cm. Sheaths pale yellowish-green, armed with scattered or laterally grouped short bulbous-based triangular black-tipped spines to 3 mm frequently with apical tufts of brown hairs, and abundant pale to dark brown scales between the spines; where spines grouped laterally, their bases confluent into short collars bearing very small spines between the main spines. Knee rather poorly developed. Ocrea low, ciliate-fringed with pale brown hairs. Leaf cirrate to 115 cm including the cirrus to 60 cm; petiole 2–3 cm, semi-circular in cross-section armed with very few scattered bulbous-based spines; leaflets pale yellowish-green, 9–11 on each side of the rachis, grouped in 2's in distal area, solitary proximally, very narrow, linear, \pm pendulous, not reflexed across the stem, to 30 \times 1 cm, frequently narrower, all \pm the same length, margins somewhat thickened, armed with scattered inconspicuous bristles; transverse veinlets conspicuous. Staminate inflorescence to 1 m branching to three orders, as in type variety but rachillae shorter and more slender (to 7 \times 1.5 mm). Pistillate inflorescence to 75 cm, with four partial inflorescences, more slender and laxer than in the type; partial inflorescences with few distant rachillae to 70 \times 2 mm. Ripe fruit as in type variety but with scales reddish-brown. Fig. 8.

SABAH. Beluran District, Pulau Sapi, Bt. Merongo, *Dransfield et al.* JD5735 (K, SAN, SAR); Telupid District: slope of Bt. Tangkunan, *Dransfield et al.* JD5781 (K, L, SAN, SAR), JD5789 (holotype K; isotype SAN).

C. laevigatus var. *serpentinus* is conspicuously different from the other varieties of *C. laevigatus* in Sabah. It is confined to soils derived from ultrabasic rock, and it is thus possible that it is merely an ecotype of *C. laevigatus* var. *laevigatus*; yet it is so distinctive in its consistently pale brownish-green colour, its leaves with short petiole and not reflexed leaflets, and the frequent presence of suckers, that I feel it must receive some taxonomic status until experimental work can be done on the response of typical *C. laevigatus* to different soil types. The specific epithet refers to the habitat—soils derived from ultrabasic rock (serpentine).

13. ***Calamus diepenhorstii* Miq. var. *major* J. Dransf. var. nov.** a varietate typica et varietate *exulanti* Becc. habitu magno, vaginis foliorum in sicco