

This is a very elegant diminutive 'wi tulang' with neat, broad, spatulate and cucullate dark green leaflets and regularly armed sheaths; the inflorescences are generally much shorter than the leaves. This is close to *C. myriacanthus* but differs in the much smaller size of all its parts, the very regular leaf sheath armature and the leaflet and inflorescence form.

Calamus sabalensis *J. Dransf.* sp. nov. a ceteris speciebus Borneensibus sectionis *Platyspathi* habitu acaulescenti caespitosa, foliolis paucis dissitis linearibus recedit. Typus: Borneo, Sarawak, *Dransfield et al.* JD 6133 (holotypus K; isotypi BH, L, SAR).

Clustering, acaulescent, undergrowth palm with short subterranean stem, c. 15 mm diam., with sheaths to c. 30 mm diam. Sheaths splitting opposite to the petiole for much of their length, dull mid-brown, sparsely armed with dark brown spines c. 3–15 mm, scattered or in groups of 2–4, largely confined to the mid-line, pale brown indumentum abundant between the spines, the leaf sheath mouth with irregular tattering ocrea to 10 cm, bearing minute spines arranged in horizontal rows or scattered. Whole leaf to c. 2 m, usually less, ecirrate, the petiole up to 1.25 m, \pm rounded in cross section, c. 5 mm diam. at the base, armed with grouped spines 5–15 mm long, spines becoming small and very sparse distally, the rachis unarmed; leaflets regularly arranged, distant, (5–) 10–15 on each side of the rachis, rather thin, drying dull greenish-brown, narrow linear-lanceolate, acuminate, the longest c. 30 \times 1.5 cm, the apical pair c. 20 \times 1 cm, armed with very sparse short bristles on 3 nerves on adaxial surface and one nerve abaxially, the margins bristly near the tips; transverse veinlets conspicuous, rather distant. Flagellum absent. Inflorescences to 1.3 m long, tending to arch out of the crown or flop on the forest floor, with 2–5 partial inflorescences; prophyll in robust inflorescences tightly sheathing the peduncle for c. 30 cm, armed with scattered spines to 10 mm, apically with a short triangular limb to 6 cm rather densely armed with brown spines to 15 mm, in smaller inflorescences the prophyll much smaller and more sparsely armed; primary bracts much smaller than the prophyll, sparsely armed or unarmed. Staminate inflorescence branching laxly to 3 orders, the proximal partial inflorescence up to 30 cm long with up to 8 distichous second order branches, the longest to 10 cm, bearing very short third order branches, the rachillae up to 4 mm, or third order branches lacking and flowers borne on branches of the second order; bracts on second and third order branches infundibuliform, striate, minutely scabrid, densely brown scaly. Staminate flower c. 3.2 mm long; calyx tubular, shallowly 3-lobed, 1.5 \times 1.5 mm, striate; petals highly polished, c. 3 \times 1 mm; filaments slender, c. 0.1 mm long, inflexed, anthers elongate, c. 1.5 \times 0.3 mm; pistillode c. 1 \times 0.2 mm, trifid. Pistillate inflorescence branching to 2 orders, the proximal partial inflorescence to c. 14 cm with about 5 distant, slightly reflexed rachillae to 70 \times 2 mm; rachilla bracts as in the staminate. Sterile staminate and pistillate flowers at anthesis not available; calyx in fruit striate, c. 2 mm, irregularly lobed; petals 2 \times 1 mm. Mature fruit spherical, 9 mm diam., tipped with a beak to 2 \times 1 mm, covered in 15 vertical rows of red-brown scales. Seed rounded, c. 7 mm diam., slightly flattened on one side; endosperm homogeneous. (Fig. 3).

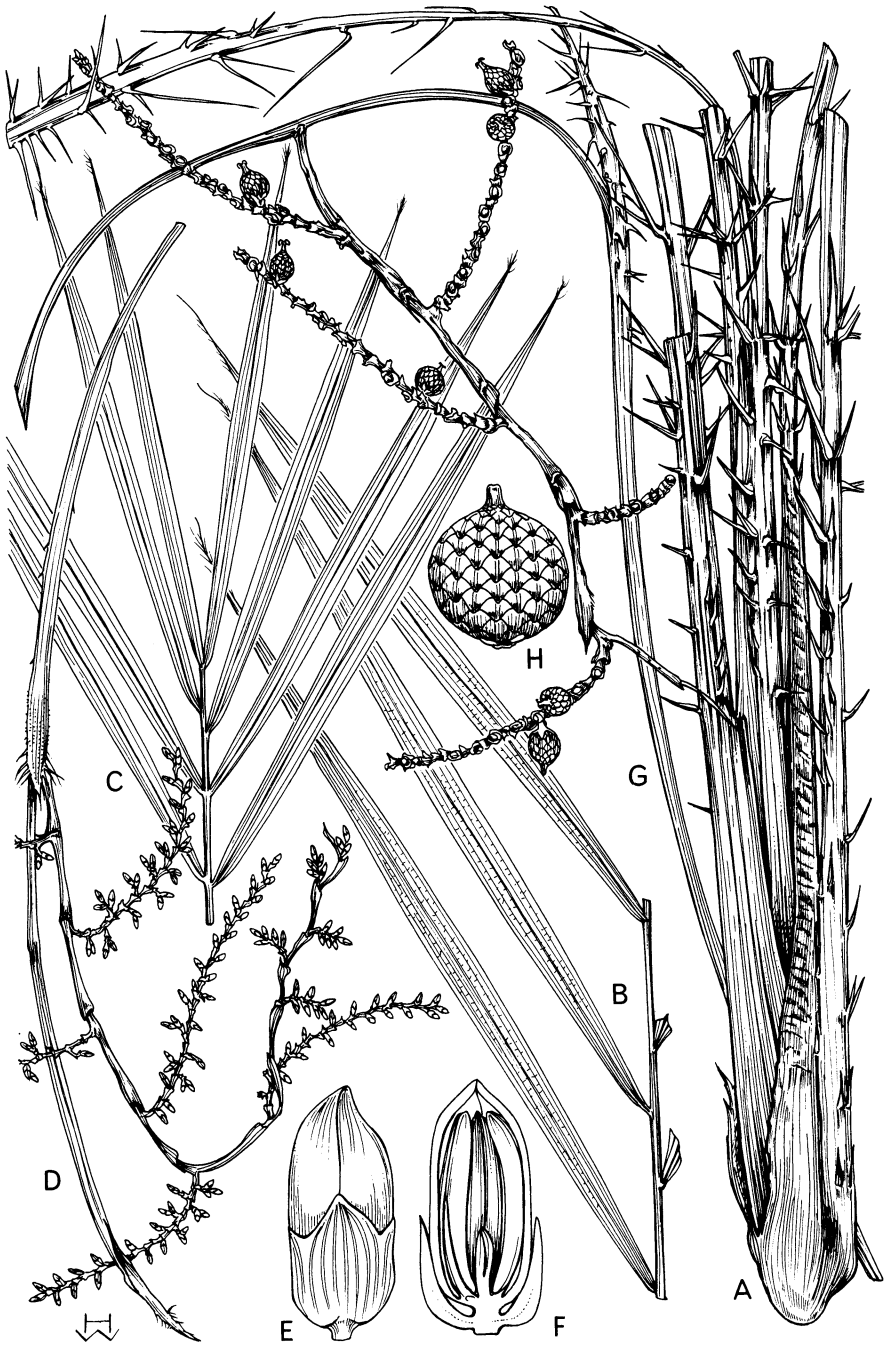


FIG. 3. *Calamus sabalensis*. **A** portion of sheathed stem $\times \frac{2}{3}$; **B** mid-section of leaf $\times \frac{1}{3}$; **C** apex of leaf $\times \frac{2}{3}$; **D** part of staminate inflorescence $\times \frac{2}{3}$; **E** staminate flower bud $\times 10$; **F** staminate flower bud in section $\times 10$; **G** part of infructescence $\times \frac{2}{3}$; **H** fruit $\times 2$. **A-C, G** from Dransfield *et al.* JD 6133, **D-F** from Dransfield *et al.* JD 6132. **H** from Dransfield *et al.* JD 6096. Drawn by Heather Wood.

BORNEO. Sarawak: 1st Division, Serian District, Sabal Tapang Forest Reserve, Mile 74, *Dransfield et al.* JD 6133 (holotype K; isotypes BH, L, SAR), JD 6132 (K, SAR); Mile 70, JD 6086 (BH, K, SAR); G. Gaharu Summit Ridge, JD 6096 (BH, K, SAR).

Calamus sabalensis is a stemless palm of 'kerangas' forest at altitudes of 20–650 m. It forms small thickets of leaves. It is probably most closely related to *C. bacularis* but differs in the clustering, stemless habit, the very few leaflets and the leaflet armature, and the very sparsely branched inflorescence with much more slender rachillae.

Calamus acanthochlamys *J. Dransf.* sp. nov. ad sectionem *Platyspathum* pertinens *C. myriacantho* affinis sed foliolis pluribus lineari-lanceolatis, spathis inflorescentiae spinis rigidis dense armatis, rachillis pistillatis crassis reflexis distincta. Typus: Borneo, Sarawak, *Ilias Paie* S 39160 (holotypus K; isotypi BH, L, SAR).

Stout, solitary rattan, climbing to 7 m tall; stem without sheaths up to 2.5 cm diam., with sheaths to 5 cm diam.; internodes short, about 5 cm long. Leaf sheaths bright green armed with robust brown spines, to 25 × 4 mm, scattered and arranged in partial whorls; pale brown indumentum abundant between the spines; knee absent; spines around the leaf sheath mouth enlarged, crowded, ± horizontal or porrect, 20–50 × 4 mm, intergrading with those of the petiole. Flagellum absent. Leaf ecirrate to 3 m including the petiole to 1.5 m; petiole 1.5 × 3 cm diam. at the base, abaxially ± bare of spines, laterally armed with regularly arranged horizontal spines 20–50 × 4 mm, armature decreasing in size and abundance distally; rachis armed with short reflexed, bulbous-based spines c. 4 mm long; leaflets regularly arranged, 40–75 on each side of the rachis, stiff, narrow, linear-lanceolate, the longest ± in mid-leaf, c. 50 × 2.5 cm, the apical c. 12 × 1 cm, somewhat divaricate, drying dull reddish or dirty brown, adaxially unarmed, abaxially armed with abundant short regular bristles on 3 nerves. Inflorescences from 1 to at least 1.5 m long, arching out of the crown; number of partial inflorescences not known; prophyll very robust, armed with lateral groups of spines and abundant pale brown tomentum, apically expanded into an irregularly tattering limb to at least 15 × 4 cm bearing abundant long brown spines to 10–40 × 3 mm; primary bracts tubular at the base, splitting longitudinally and expanded to form a long lanceolate blade, up to 40 × 3 cm, sparsely to heavily armed with spines 1–15 × 2 mm, and caducous tomentum, the whole limb ± as long as or exceeding the partial inflorescence. Staminate inflorescence branching to 3 orders; partial inflorescence ± triangular in outline, up to c. 35 × 24 cm, 2nd order branches held ± at right angles to the first order, the longest ± 12 cm long, bearing distichously arranged, rather congested, ± reflexed short rachillae, the longest c. 12 × 2 mm, decreasing distally; rachilla bracts densely tomentose. Staminate flower c. 5 × 1.5 mm; calyx tube faintly striate, c. 1.75 × 1.5 mm with lobes c. 0.75 × 1 mm; filaments 2 × 0.2 mm, inflexed in bud, anthers 1.5 × 0.4 mm; pistillode conical, c. 1 × 0.2 mm. Pistillate inflorescence branching to 2 orders; partial inflorescence ± oblong in outline, 17–30 × 3–6 cm, bearing strictly distichous, low, ± horizontal bracts 5 × 6 mm; rachillae strictly distichous, stiff, ± reflexed, held in one plane,