

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,

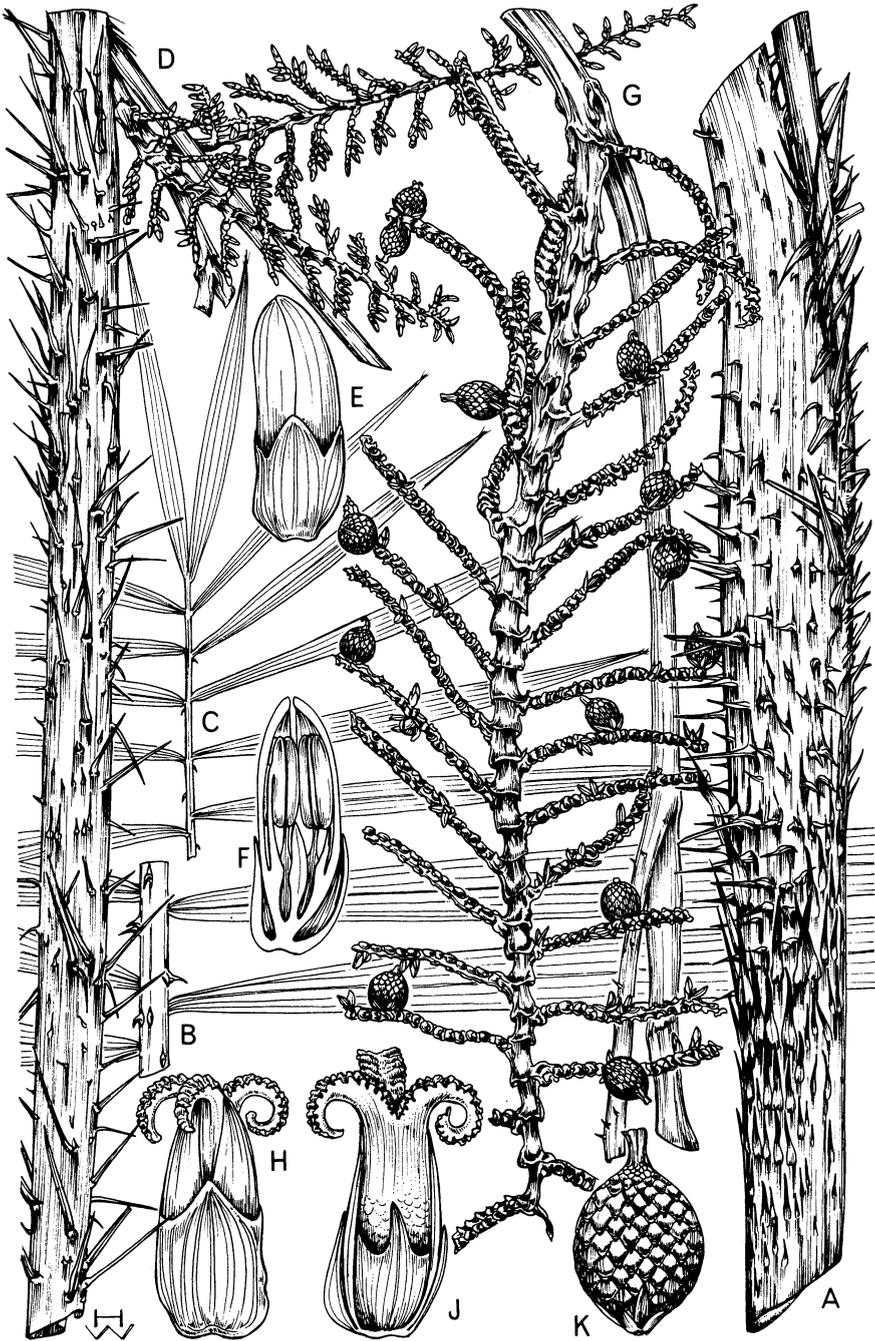


FIG. 4. *Calamus acanthochlamys*. **A** portion of sheathed stem $\times \frac{2}{3}$; **B** mid-section of leaf $\times \frac{1}{3}$; **C** apex of leaf $\times \frac{2}{3}$; **D** part of staminate inflorescence $\times \frac{2}{3}$; **E** staminate flower bud $\times 7\frac{1}{2}$; **F** staminate flower bud in section $\times 7\frac{1}{2}$; **G** part of infructescence $\times \frac{2}{3}$; **H** pistillate flower $\times 7\frac{1}{2}$; **J** pistillate flower, one petal removed $\times 7\frac{1}{2}$; **K** fruit $\times 2$. **A-C**, **G-K** from *Ilias Paie* S 39160, **D-F** from *Richards* 2333. Drawn by Heather Wood.

20–50 × 4 mm; rachilla bracts densely tomentose. Sterile staminate flower 4 × 1.5 mm, as the fertile but with empty anthers. Pistillate flower 5 × 2.5 mm; calyx tube 2 × 2.5 mm, the lobes c. 0.4 × 1.5 mm; petals 4 × 1.5 mm; staminodal ring c. 1 mm high bearing filaments c. 0.75 mm and empty anthers 1.5 mm; ovary c. 1 mm diam., tipped with divergent stigmas to 3 mm. Mature fruit ± broad-ellipsoid, 10 × 8 mm, tipped with a beak 2 × 1.5 mm, and covered with 18 vertical rows of chestnut-brown scales. Seed ellipsoid, c. 8 × 5 mm; endosperm homogeneous. (Fig. 4).

BORNEO. Sarawak. 4th Division, Miri Suai, Ulu Sg. Sibau, *Ilias Paie* S 39160 (holotype K; isotypes BH, L, SAR); Ulu Sinrok, Similajau Forest Reserve, *Ashton* S 16587 (K, SAR); Ulu Tinjar, G. Dulit, *Richards* 2333 (K); 7th Division, Ulu Belaga, Kuala Linau, Rumah Nyaving, *Dransfield et al.* JD 4701 (K, KEP, SAR).

Calamus acanthochlamys is one of the largest of the 'wi tulang'. It is most closely related to *C. myriacanthus* but differs in the numerous stiff narrow leaflets, the very congested strictly distichous, reflexed rachillae and the dense armature of the bracts.

5. The identity of *Calamus scabrifolius*

Beccari distinguished *C. scabrifolius* from *C. sarawakensis* by the regular rather than inequidistant leaflets. There is now sufficient material to show variation and I am unable to separate two species satisfactorily. *C. scabrifolius* is thus reduced to synonymy.

Calamus sarawakensis *Becc.* in *Rec. Bot. Surv. India* 2: 208 (1902) and *Ann. Roy. Bot. Gard. Calcutta* 11: 335 (1908). Type: Borneo, Sarawak, G. Matang, *Beccari* PB 1920 (holotype FI).

Calamus scabrifolius *Becc.* in *Ann. Roy. Bot. Gard. Calcutta* 11. *Suppl.*: 56 (1913). Type: Borneo, Sarawak, Puak, *Ridley* 12406 (holotype K); **synon. nov.**

6. The identity of *Calamus flabelloides*

I have already discussed the close similarity between *Calamus flabellatus* and *C. flabelloides* (*Dransfield* 1979), and I hinted that *C. flabellatus* might represent a juvenile form of *C. flabelloides*. I have never found *C. flabellatus* in a fertile state; intermediates bearing leaves with a terminal flabellum and one or two lateral leaflets have been collected (e.g. *Dransfield et al.* 6070, and *Ridley* s.n. at Puak, both in K) linking the two states represented by the two names. I now feel confident in reducing *C. flabelloides* to synonymy with *C. flabellatus*. It should be noted, however, that the form originally described by Beccari as *C. flabellatus* probably retains juvenile foliage longer than is normal in this species.

Calamus flabellatus *Becc.* in *Malesia* 3: 62 (1886) and in *Ann. Roy. Bot. Gard. Calcutta* 11: 176 (1908); *Furtado* in *Gard. Bull. Singapore* 15: 168 (1956); *Dransfield*, *Man. Ratt. Mal. Pen.* 195 (1979). Type: Borneo, Sarawak, G. Matang, *Beccari* PB 1911 (holotype FI).