

with blackish brown indumentum; leaflets up to 30 on each side of the rachis, arranged regularly, close, the rachis abaxially armed with short, reflexed grapnel spines to 2 mm, sparse, blackish brown hairs also present; lowermost leaflets to  $190 \times 8$  mm; mid-lamina leaflets to  $220 \times 10$  mm; leaflets gradually decreasing in size distally, the uppermost to  $150 \times 5$  mm; adaxial surface unarmed except for a few distant bristles on the mid-vein; margins with distant very short bristles, 0.5 mm long, up to 5 mm long near the tip; abaxial surface proximally with blackish brown hairs, densely bristly along mid-vein and 2 lateral veins, the bristles brown, to 1 mm. *Staminate inflorescence* arcuate, flagelliform, to 150 cm; prophyll over 270 mm, closely tubular, densely armed with short, reflexed, brown grapnel spines to 2 mm, covered with blackish brown indumentum, prophyll subtending a partial inflorescence; partial inflorescences 5, very slender, distant to 260 mm, axis of partial inflorescence bearing up to 9 distichous 2nd order branches, each subtended by a tubular peduncular bract, sparsely armed with reflexed brown spines, covered with blackish brown indumentum, the most proximal to 110 mm; rachillae 3–20 mm long, subtended by tubular bracts with fimbriate margins, covered with papillose hairs, rachillae with strictly distichous bracts with fimbriate margins, each subtending one staminate flower. Only *staminate flowers* (still young) known, to  $2.5 \times 1$  mm; calyx cupular, glabrous, 1.3 mm long with 3 short triangular lobes; corolla glabrous, to 2 mm, split into 3 petals; stamens 6, briefly epipetalous, to  $1.5 \times 0.2$  mm, pistillode trifold to  $1 \times 0.2$  mm.

*Derivation* — The specific epithet refers to the dark-brown scales on leaf sheath, flagellum and petiole.

*Distribution* — Borneo: Kalimantan Timur (Wanariset).

*Note* — *Calamus nigricans* superficially resembles *C. pilosellus* and *C. sarawakensis*, but differs in armature of leaf sheath, the blackish brown hairs on the rachis, and staminate flowers that are very different. *Calamus nigricans* is related to *C. muricatus* and allied species but lacks the muricate armature.

*Other specimen examined* — BORNEO. Kalimantan Timur, Wanariset research station near Samboja 38 km N of Balikpapan,  $1^\circ$  S  $117^\circ$  E, alt. 50 m, *Ambri & Arifin W 908* (Wanariset, BO, L).

### ***Daemonorops pumilus* Valkenburg, *spec. nov.* — Fig. 3**

Species nova ad sectionem *Piptospatha* pertinens, speciebus palmijuncis quorum vaginae cuniculos formicarum incompletos ferentes (ut in *D. atra* Dransfield et *D. collarifera* Becc.) affinis; sed species nova foliolis aliquantum distantia regulariter dispositis internodiisque brevissimis — Typus: *van Valkenburg JVV 1396* (holo L; iso BO, K, Wanariset), Borneo, Kalimantan Timur, Long Sungai Barang in Apo Kayan region,  $1^\circ 40' N$   $115^\circ E$ , alt. 800 m.

Clustering, pleonanthic, dioecious, spiny, climbing palm. *Stems* short, climbing to 2 m, often scrambling and rooting at the nodes, resulting in reversal to juvenile state; stem without sheaths to c. 8 mm diameter, with sheaths to c. 15 mm diameter; internodes rarely exceeding 50 mm. *Sheath* brownish green when fresh, armed with up to 7, oblique (rarely complete), reflexed collars, to 1 mm, bearing brittle laminar, brown to blackish spines of very irregular size, varying from horsehair-like spicules to 4 mm, to broad spines  $20 \times 3$  mm; spines around the leaf sheath mouth mostly erect, to 50 mm long; sheaths, collars and spines covered with pale brown indumentum; knee inconspicuous, armed with smaller, very incomplete spine whorls. Ants

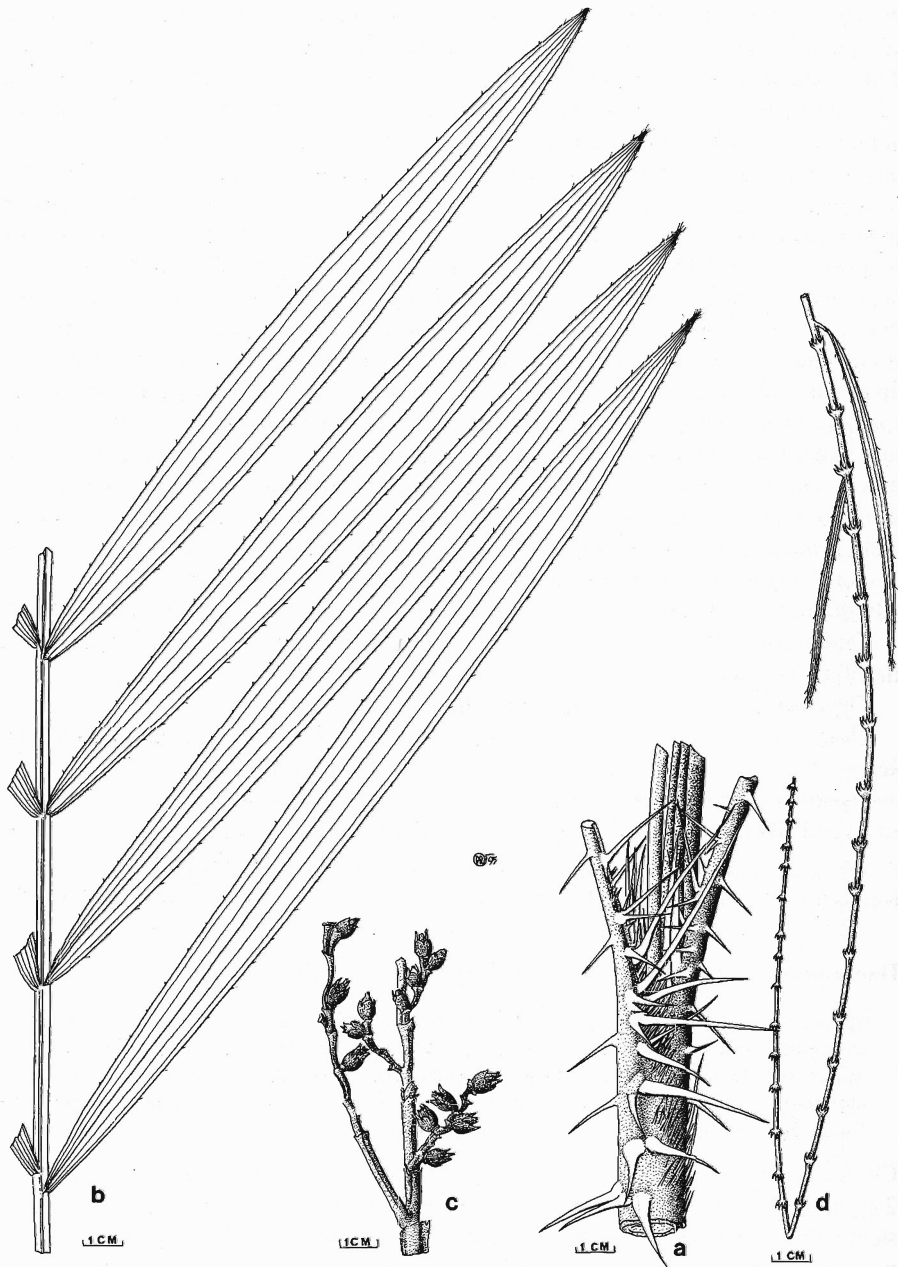


Fig. 3. *Daemonorops pumilus* Valkenburg. a. part of sheathed stem; b. mid-portion of leaf; c. part of inflorescence; d. leaf tip (all van Valkenburg JVV 1396).

frequently present between spines. Whole *leaf*, excluding sheath, to 1.5 m, including cirrus to 30 cm long; petiole oval in cross section, to 10 mm wide near base tapering to 5 mm, armed near the base with stiff, robust, rather distant, lateral and abaxial spines to 20 mm, frequently accompanied by much shorter spines; adaxial petiole surface  $\pm$  unarmed; spine length and density decreasing distally; leaflets long-acuminate, up to 18 on each side of the rachis, regularly arranged; proximal leaflets to  $210 \times 15$  mm, mid-lamina leaflets to  $270 \times 18$  mm, distal leaflets to  $150 \times 13$  mm; adaxial leaflet surface unarmed (except for midrib distally); abaxial surface armed with 3 rows of short brown bristles to 2 mm; leaflet margin very sparsely armed, bristles crowded near the tip. Pistillate *inflorescence* to 300 mm; peduncle short at anthesis, eventually to 300 mm, sparsely armed with lateral bristles, densely covered with pale brown indumentum; peduncular bracts deciduous prior to anthesis; up to 3 partial inflorescences, the longest to 10 cm; axis of partial inflorescences brown indumentose, bearing up to 11 distichously arranged rachillae, each subtended by a persistent but tattered triangular bract; rachillae to 35 mm. Sterile *staminate flower* curved, to 5 mm. Almost mature *pistillate flower* bud to  $6 \times 3$  mm; calyx with tube to 3 mm, and 2 or 3 lobes to 1 mm, corolla with short basal tube and 3 narrow, triangular lobes; staminodal ring epipetalous, with filaments joined to form a short ring 1 mm high, with staminodes to 1.5 mm; ovary tipped with 3 stigmas to 2 mm long. Fruits and staminate inflorescence not known.

**Derivation** — The specific epithet refers to the very short internodes, and the small stature of the plant.

**Distribution** — Borneo (Kalimantan Timur).

**Habitat** — Found on dry upper slopes in hill dipterocarp forest at 800 m above sea level.

**Vernacular name** — Uei metenda'an (Lepo Tukung Kenyah).

**Note** — *Daemonorps pumilus* differs from *D. atra* and *D. collarifera* in the regularly arranged leaflets. From *D. collarifera* the species differs in the smaller size of all its parts. From *D. atra* the species differs in the shorter internodes, the secondary bracts being inconspicuous, and the less developed armature of the leaf sheath.

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