Four New Taxa of Philippine Rattans (Palmae: Calamoideae)

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Abstract

Calamus aidae E. Fern., *C. balerensis* E. Fern., *C. ornatus* Blume var. *pulverulentus* E. Fern. and *Daemonorops polita* E. Fern. are described as new taxa of rattans from the Philippines.

Recent intensive collection of herbarium material of rattans in the Philippines has resulted in the discovery of undescribed taxa. There is need to provide names for these rattans as most of them are already being commercially exploited and their habitats are threatened. This paper is published to validate names for four new taxa.

Calamus aidae E. Fern., *sp. nov.* Fig. 1

Species distinctissima, inter species Philippinenses flagello cirroque carentibus, foliolis infra dense albide-farinosis setosisque, ocrea papyracea mox fatiscenti distinguibilis. *Typus:* Samar, Basey, Guirang, Rawis, *Baja-Lapis 123* (holotypus K; isotypus LBC).

Robust, solitary, pleonanthic, dioecious rattan. Stems climbing to 15 m; stem without sheaths 2.5–4.0 cm dia., with sheaths to 6 cm dia.; internodes to 18 cm long. Leafsheaths densely covered with creamish-green, mealy indumentum and armed with brown, slender, narrowly laminar and acicular spines to 6.5 cm long, arranged closely in partial whorls, those around leafsheath mouth longer, erect; the spines very brittle and readily breaking off; knee present although hardly developed, armed as the sheath but less densely so; ocrea to 40 cm long, 3 cm wide near the base, papery, creamish or dirty white in colour, the proximal portion sparsely covered with brownish indumentum and armed along the edges with acicular spines to 6 cm long, ocrea prominent in newly expanded leaves, but quickly tattering and disintegrating. Leaf subcirrate, to 3 m long, including petiole; cirrus none; petiole to 30 cm long, semi-circular in transverse section, flattened to slightly concave on adaxial side, convex on abaxial side, to 3.5 cm wide, 1.5 cm thick near base, armed with scattered, slender, laminar spines to 5 cm long on adaxial surface and along edges, the spines decreasing in size distally, abaxial surface generally smooth, except near the edges; petiole and rachis covered with brownish, mealy indumentum; rachis at mid-portion nearly triangular in section, bifacial above and armed along top edge with short rigid spines to 4 mm long, arranged 15–25 mm apart, flattened or convex below and armed with rigid and robust 3-hooked grapnel spines to 1.5 cm long, arranged 6–8 cm apart, becoming 2-hooked then single-hooked grapnel spines towards tip. Leaflets to 130 on each side of the rachis, coriaceous, stiff, regularly arranged to 3 cm apart, linear-lanceolate; adaxial surface drying pale or light greenish-yellow, glabrous, except for very short bristles to 2 mm long and spaced to 7 mm apart along margins, transverse veinlets prominent; abaxial surface covered with chalky-white indumentum and dense bristles along all costae, those along the mid-costa to 4 mm long, all others generally shorter;

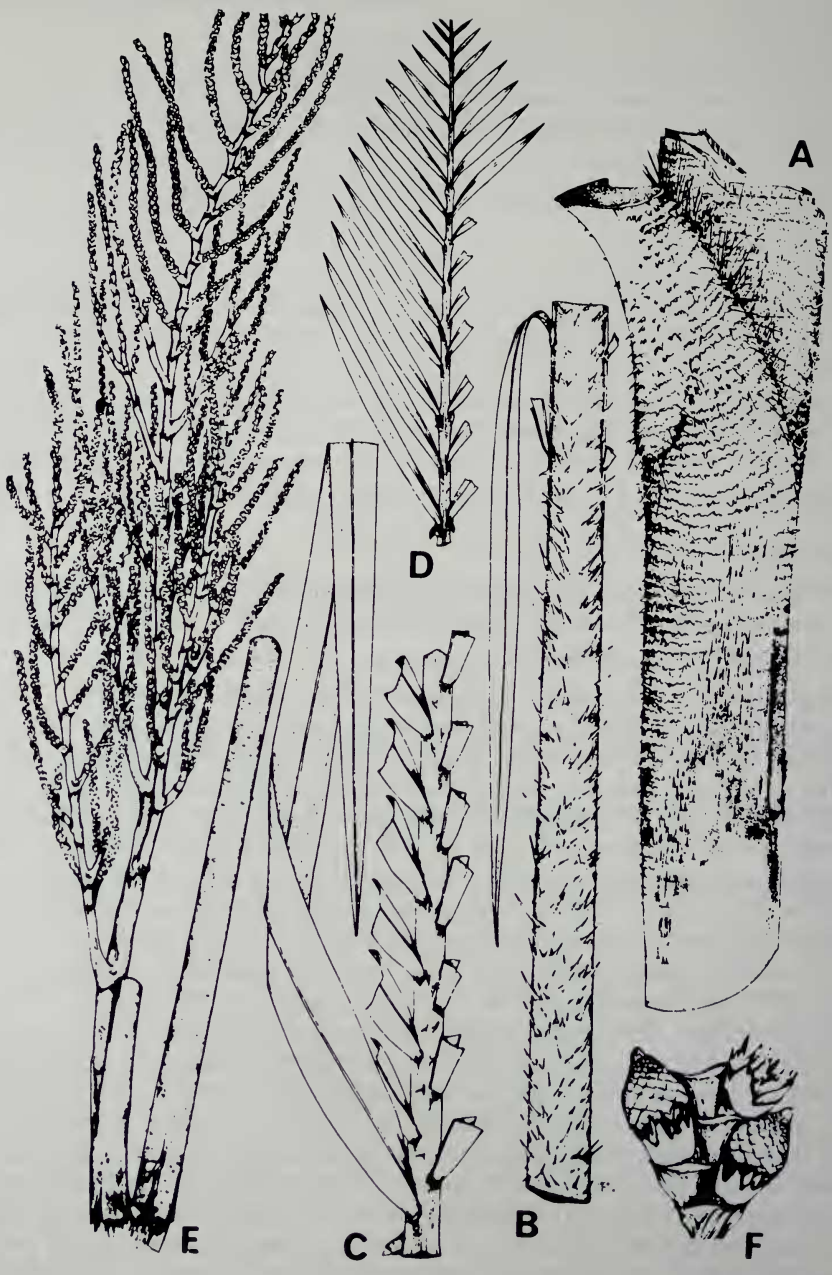

Fig. 1. *Calamus aidae* E. Fern. — A. leafsheath, ×2/5; B. petiole, ×2/5; C. mid-portion of leaf, ×2/5; D. leaf apex, ×2/5; E. portion of pistillate inflorescence, ×2/5; F. portion of rachilla with young fruits, ×2 1/2. A, E, F from *Baja-Lapis 123; B, C, D* from *Fernando 414.*

basal leaflets to 25 × 1.0 cm; mid-lamina leaflets to 49 × 2.2 cm, apical leaflets to 5.5 × 0.3 cm, smaller, rudimentary leaflets often present. Staminate inflorescence not known. Pistillate inflorescence generally ascending, to 2 m long, with up to 5 partial inflorescences spaced to 50 cm apart, decreasing in size distally; prophyll tubular, to 20 × 1.8 cm, elliptic in section, 2-keeled, armed with scattered laminar bulbous-based spines to 1.5 cm long, mouth of prophyll surrounded with bristles to 5 cm long; other bracts similar but decreasing in size distally and becoming less densely armed to glabrous; peduncle c. 12 × 1 cm to the prophyll scar; partial inflorescence to 35 cm long, bearing to 20 tubular bracts, each to 13 × 8 mm, the upper half often tattering, unarmed and covered with creamish-green indumentum, the proximal up to 7th bract bearing second-order branches, the succeeding and ultimate bracts bearing rachillae; second-order branches to 19 cm long, with up to 11 rachillae, each to 40–90 × 3 mm, generally erect, borne above subtending bract; rachilla bearing distichously arranged bracts, each subtending a flower pair, alveolus of sterile staminate flower c. 1 mm dia., that of pistillate flower c. 1.5 mm dia. Sterile staminate and pistillate flowers not known. Fruit (immature) globose, c. 7 × 6 mm, beaked; pericarp with scales arranged to 13 vertical rows, pale yellowish-green and with prominent mid-scale groove. Seed not known. Seedling leaf (eophyll) pinnate, with 5–7 pairs of leaflets, each to 35 × 2 mm, with chalky white indumentum and short bristles along margins and midcosta on undersurface.

Distribution and Habitat: Luzon (Sorsogon Prov.), Samar, Biliran, Dinagat, and Mindanao (Surigao Prov. and Agusan del Sur Prov.); in dipterocarp forest at c. 50–500 m alt. Endemic.

Vernacular names: Ulisi (Biliran), Ulasi (Samar), Inhian (Agusan del Sur).

Specimens examined: Luzon: Sorsogon Prov., Irosin, Mt Bulusan, *Elmer 16871* (BM, K); Samar: Basey, Guirang, Rawis, *Baja-Lapis 123* (holotype K; isotype LBC); Biliran: Naval, Mohon, *Fernando 679* (LBC); Dinagat: locality not known, *Ramos & Pascasio B.S. 35250* (in part, as to portion of inflorescence only) (K); Mindanao: Surigao Prov., locality not known, *Ponce F.B. 25070* (BM, K); Surigao del Sur Prov., Bislig, *Fernando 727* (LBC), Agusan del Sur Prov., Trento, *Fernando 414* (K, LBC).

Calamus aidae is an unusual and very distinctive Philippine rattan in the curious absence of either a cirrus or a flagellum, in the dense short bristles and chalky-white indumentum on the undersurface of leaflets, and in the long, papery ocrea which quickly disintegrates. Earlier collections of this species have been referred to either *C. discolor* Mart. or *C. bicolor* Becc. owing to its similarly discolorous leaflets, *C. discolor*, however, has distinctly ecirrate leaves and the leafsheath bears a flagellum; *C. bicolor*, on the other hand, has leaves with a prominent cirrus. Features of the inflorescence suggest that *C. aidae* may be related to *C. inops* Becc. ex Heyne of Sulawesi (Dransfield, pers. comm.).

This species is named for Mrs Aida Baja Lapis who collected the type specimen.

Calamus balerensis E. Fern., *sp. nov.* Fig. 2

C. usitato Blco. affinis sed foliis subsessilibus multo brevioribus, foliolis non nisi marginibus setosis, pagina adaxiali in sicco nitida, semine brunneo laeve differt. *Typus:* Luzon, Aurora Prov., Baler, *Fernando 478* (holotypus LBC; isotypus K).

Very slender, clustering, pleonanthic, dioecious rattan. Stems to 3 m long, without sheaths 3–4 mm dia., with sheaths to 6 mm dia., internodes to 8 cm long. Leafsheaths

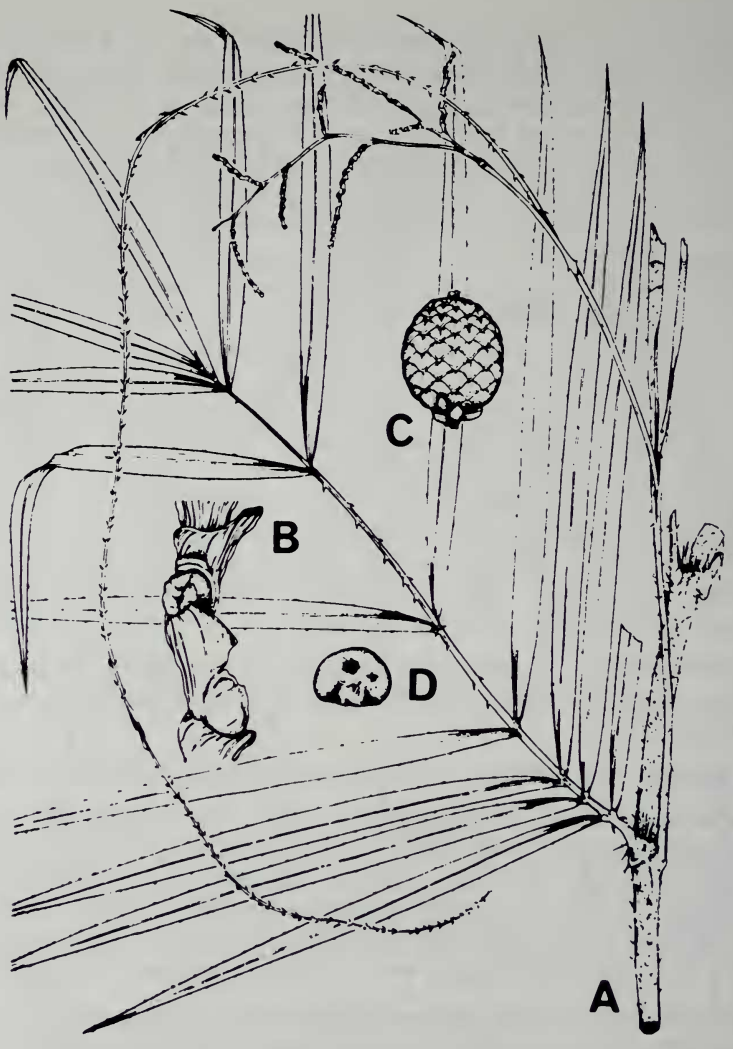

Fig. 2. *Calamus balerensis* E. Fern. — A. sheathed stem with one leaf and old infructescence, ×1/2; B. detail of rachilla, ×6; C. fruit, ×1 1/4; D. seed, ×1 1/4. All from *Fernando 478.*

bright green, armed with scattered, light-brown, slender, acicular spines to 7 mm, yellowish and broad at their base, those around leafsheath mouth longer to 18 mm, erect; knee conspicuous, armed as the sheath; flagellum to 50 cm long, armed with short rigid spines; ocrea inconspicuous. Leaf ecirrate, c. 14–18 cm long; petiole very short, to 5 mm, sometimes nil; rachis angular in section, bifacial above, flattened below and armed with solitary black-tipped, reflexed, rigid spines to 3 mm long. Leaflets up to 8 on each side of the rachis, pendulous, irregularly arranged 2–45 mm apart, singly or in groups of up to 4 and held in same plane, linear-lanceolate, adaxial surface drying glossy greyish-green, the costae on both surfaces unarmed, except for very short bristles along the margin, becoming more conspicuous near the leaflet tip, the bristles to 1 mm or often less; transverse veinlets prominent; basal leaflets to 16.8 × 0.7 cm, mid-lamina leaflets to 18.4 × 0.8 cm; apical leaflets to 1.2 ×

0.7 cm, the last pair joined to 6 mm along rachis tip. Staminate inflorescence not known. Pistillate inflorescence pendulous, to 60 cm long, with up to 3 partial inflorescences and terminating in a well-defined flagellum, the partial inflorescences spaced to 15 cm apart, decreasing in size distally; prophyll tubular, to 17 × 0.3 cm, armed with scattered short, black, rigid spines to 2 mm; other bracts similar but decreasing in size distally; peduncle c. 16 × 0.2 cm to the prophyll scar; partial inflorescence pendulous, to 12 cm long, with up to 6 second-order branches of which the proximate one often bearing up to 3 rachillae, succeeding and ultimate second-order branches as rachillae; rachilla to 25–35 × 2 mm, very slender, flexuous, bearing distichously arranged, striate bracts, each subtending a flower pair, alveolus of sterile staminate flower c. 0.5 mm dia., that of pistillate flower c. 1 mm dia. Sterile staminate and pistillate flowers not known. Fruit globose-oblong, to 1.5 × 1 cm when fresh, with a rather obtuse or blunt beak; pericarp with scales arranged in 15 vertical rows, dull light-green to creamish-yellow, with light brown margins and mid-scale groove. Seed plano-convex, to 1 × 1.2 × 0.8 cm when fresh, smooth, brown and glossy on surface; endosperm homogenous. Seedling leaf not known.

Distribution and Habitat: Luzon (Aurora Prov.); in forest with large boulders, facing the sea, c. 50 m alt. Endemic.

Specimens Examined: Luzon: Aurora Prov., Baler, Digisit, *Fernando 478* (holotype LBC; isotype K), Semento, *Hernaez 3874* (CAHP).

This species belongs to Section *Coleospathus* Furt. and is closely related to *C. usitatus* Blco. differing in the much shorter leaves with a very short and often absent petiole, in the leaflets armed with short bristles only along the margins and drying glossy on the adaxial surface, and in the seed which is brown and generally smooth on the surface. In contrast, *C. usitatus* generally has longer leaves with a distinct, well-developed petiole; the leaflets are armed with bristles on both surfaces and along margins, and drying dull on the adaxial surface; the seed is black and with rough, irregular surface. Furthermore, *C. usitatus* often has leafsheaths and petioles covered with dull greyish-brown indumentum, a feature not found in *C. balerensis.* Although *C. usitatus* is such a variable species, *C. balerensis* has characters which amply separate it as a distinct species.

The specific epithet refers to the type locality.

Calamus ornatus Blume var. **pulverulentus** E. Fern., *var. nov.* Fig. 3

A ceteris varietatibus vaginis foliorum semper inermibus et simul petiolis, rachidibus foliorum et bracteis inflorescentiae indumento cineraceo-brunneo dense tectis, et squamis fructu atratis differt. *Typus:* Mindanao, Zamboanga Peninsula, La Paz, *Fernando 599* (holotypus LBC; isotypus K).

Robust, clustering, pleonanthic, dioecious rattan. Stems climbing to 20 m, stem without sheaths to 2.5 cm dia., with sheaths to 5 cm dia.; internodes to 38 cm long. Leafsheaths completely inerm, densely covered with greyish-brown, mealy or powdery indumentum; knee very conspicuous, unarmed as the leafsheath; ocrea scarcely developed; flagellum to 5 m long, armed with rigid grapnel spines. Leaf subcirrate, rarely ecirrate, to 3 m long; petiole to 30 cm long, semi-circular in transverse section, flattened to slightly convex on adaxial side, convex on abaxial side, to 2.5 cm wide, 1.0 cm thick near base, armed with solitary rigid spines to 6 mm, only along edges and occasionally along mid-portion on abaxial surface; petiole and rachis covered with greyish-brown, mealy indumentum, rather thick below and along the edges; rachis at mid-portion triangular in section, bifacial and unarmed above, flattened or slightly convex below and armed with black, rigid, grapnel spines arranged to 4–8 cm apart.

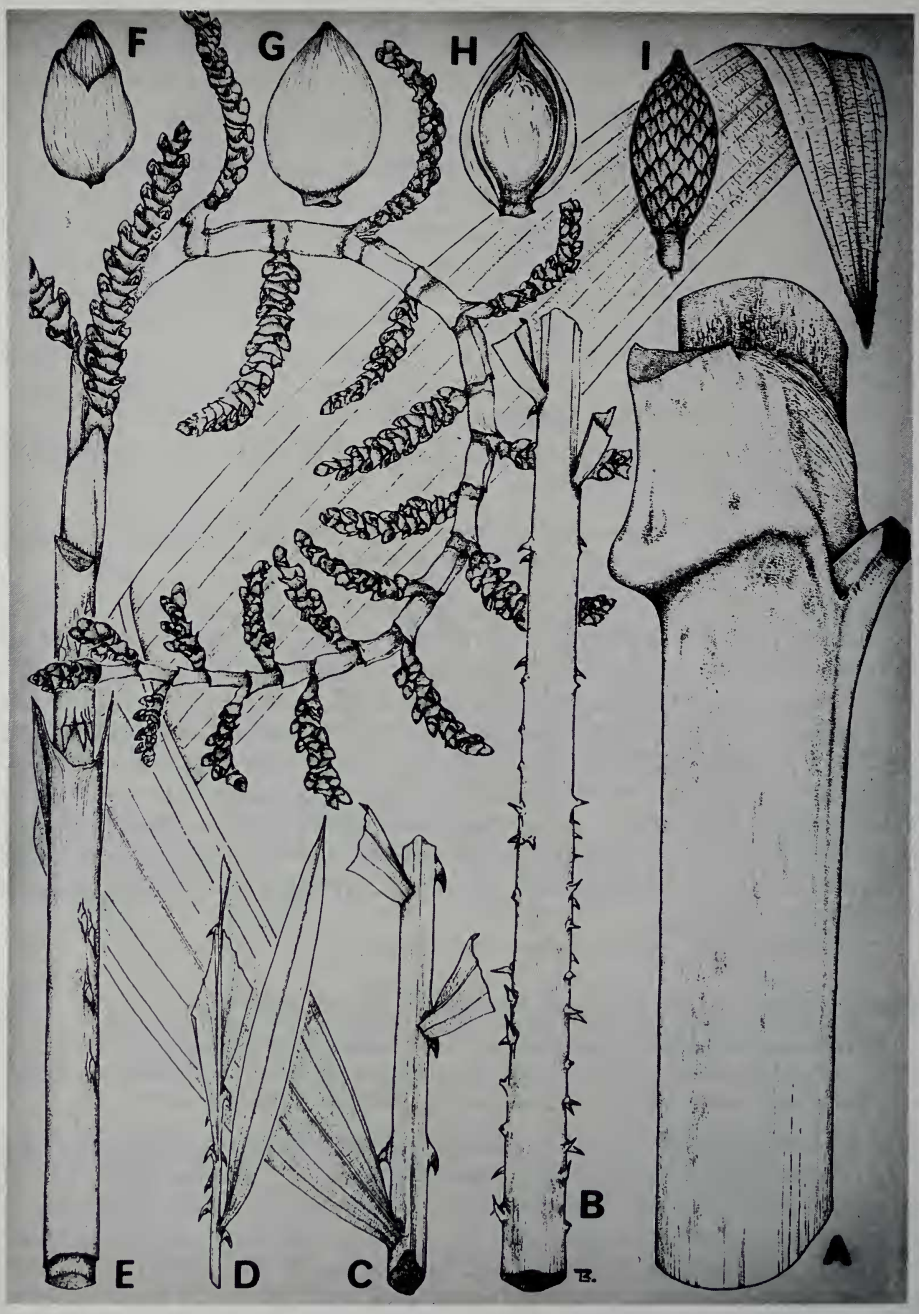

Fig. 3. *Calamus ornatus* Blume var. *pulverulentus* E. Fern. — A. leafsheath with base of flagellum, ×2/5; B. petiole, ×2/5; C. mid-portion of leaf, ×2/5; D. leaf apex, ×2/5; E. partial pistillate inflorescence, ×2/5; F. sterile staminate flower, ×3 1/3; G. pistillate flower in bud, ×3; H. vertical section of pistillate flower in bud, ×3; I. immature fruit, 3/5. All from *Fernando 599.*

Leaflets to 25 on each side of the rachis, arcuate, regularly arranged to 9–14 cm apart, broadly linear-elliptic to lanceolate, generally unarmed on both surfaces except near leaflet tip where midcosta on adaxial side and margins are armed with short spiculae to 1.5 mm, transverse veinlets prominent; basal leaflets to 57 × 6 cm; mid-lamina leaflets to 70 × 7 cm; apical leaflets to 15 × 1.5 cm, the terminal pair often fused to the tip of rachis. Staminate inflorescence not known. Pistillate inflorescence flagelliform, pendulous, to 3 m long, with up to 3 partial inflorescences and terminating in a well-defined flagellum, the partial inflorescences spaced to 55 cm apart, slightly decreasing in size distally; peduncle to 8 × 3 cm to the prophyll scar, laterally compressed and 2-keeled, unarmed, covered with greyish-brown, mealy indumentum; prophyll closely tubular to 56 × 3 cm, covered with greyish-brown, mealy indumentum and generally unarmed except along edges on proximal side where sparsely armed with bulbous-based laminar spines to 1.5 cm long; other primary bracts similar but decreasing in size distally and completely unarmed, all other bracts similarly covered with mealy indumentum and margins fringed with caducous cream-coloured hairs to 3 mm; partial inflorescences to 42 cm long, arcuate, bearing to 21 reflexed rachillae, each rachilla subtended by a tubular bract to 3.5 × 1.5 cm, decreasing in size distally; rachilla c. 9–20 × 1 cm, robust, decreasing in length distally, and bearing to 20 bracts, each subtending a flower pair, alveolus of sterile staminate flower c. 2 mm dia., that of pistillate flower c. 4 mm dia. Sterile staminate flower c. 6 × 3 mm; calyx 3-lobed, with basal tube to 4 mm and triangular lobes to 1.5 mm; corolla with very short basal tube and 3 petals to 4 × 2 mm; stamens 6, with filaments to 2 mm long and anthers 1.5 × 0.5 mm; pistillode trifid to 1 mm high. Pistillate flower c. 7 × 5 mm; calyx tubular in basal 4 mm with three triangular lobes to 3 × 2 mm; corolla with short basal tube and three petals to 5 × 2.5 mm; staminodal ring to 2.5 mm high bearing 6 minute triangular teeth; ovary c. 4 × 1.5 mm. Fruit (immature) obovoid-ellipsoid or spindle-shaped, c. 4.2 × 2 cm, tipped with a beak to 4 mm; pericarp with scales arranged in 15 vertical rows, dark brownish-black with darker margins and prominent mid-scale groove. Seed from immature fruit rather angular; sarcotesta sour; endosperm homogenous. Seedling leaf not known.

Distribution and Habitat: Palawan and Mindanao (Zamboanga Peninsula); in dipterocarp forest at c. 100–800 m alt. Endemic.

Vernacular names: Borongan (Zamboanga), Mananga (Palawan).

Specimens Examined: Palawan: Puerto Princesa, Bagumbayan, *Dransfield 5486* (K, LBC), Irawan, *Madulid 1007* (K, PNH); Aborlan, Talakigan River, *Hernaez 3875* (CAHP, LBC); Mindanao: Zamboanga Peninsula, Malayal, *Fernando 589* (K, LBC), La Paz, *Fernando 599* (holotype LBC; isotype K).

This new variety is distinguishable from all other varieties of *C. ornatus* Blume in the leafsheaths which are consistently completely unarmed and densely covered with greyish-brown, powdery indumentum, including petioles, leaf rachis, and inflorescence bracts, and in the dark brownish-black fruit scales. The other endemic variety of *C. ornatus* in the Philippines, *C. ornatus* Blume var. *philippinensis* Becc., is more widespread in the islands and differs from *C. ornatus* var. *pulverulentus* in the leafsheaths being dark green and armed with laminar spines and in the fruit scales which are yellowish with blackish margins.

The varietal epithet refers to the powdery indumentum on the leafsheaths.

Daemonorops polita E. Fern., *sp. nov.* Fig. 4

Structura inflorescentiae et bracteis secondariis tertiariisque saepe findentibus *D. ruptili* Becc. var. *ruptili* affinis sed habitu solitario, vagina folii spinis complanatis latioribus basi tumidis in verticillis partialibus dispositis, geniculo conspicuo, foliolis confertioribus, subtus 3-nervis setosis, fructu rotundiore differt; *D. ruptili* Becc. var. *acaulescenti* Dransf. idemque affinis sed habitu et folio differt. *Typus:* Mindanao, Zamboanga Peninsula, La Paz, *Fernando 575* (holotypus LBC; isotypi BH, K).

Robust, clustering, pleonanthic, dioecious rattan. Stems climbing to 15 m, stem without sheaths to 2.5 cm dia., with sheaths to 4 cm dia., internodes to 22 cm long. Leafsheaths covered with reddish-brown indumentum and armed with pale yellowish, laminar spines to 4 cm long, to 1 cm broad at base, rigid, arranged in partial whorls, generally horizontal or reflexed; knee conspicuous, only sparsely armed with shorter laminar spines, or generally smooth; ocrea inconspicuous. Leaf cirrate to 3 m long including cirrus to 1 m long; cirrus armed with grapnel spines; petiole yellowish in colour, to 20 cm long, semi-circular in section, slightly concave on adaxial side especially near base, convex on abaxial side, to 2.5 cm wide, 1 cm thick near base, armed with laminar spines to 3 cm long, arranged in groups along the edges and abaxial surface and with shorter spines to 1.5 cm long on adaxial surface, all spines on petiole decreasing in size distally; abaxial surfaces of petiole and rachis yellowish, covered with indumentum as the leafsheath; rachis at mid-portion nearly triangular in section, bifacial above, smooth or only sparsely armed with short spines, flattened or convex below and armed with rigid grapnel spines to 8 cm apart. Leaflets to 85 on each side of the rachis, coriaceous, stiff, regularly arranged, rather closely set to 1.7–2.0 cm apart, linear-lanceolate, bright green, concolorous; adaxial surface glabrous to sparsely bristly along mid- and side costae, especially toward leaflet tip, the margins armed with short bristles to 1 mm, often in pairs, transverse veinlets rather indistinct; abaxial surface armed with bristles to 2 mm long, very closely set along mid-costa and sparsely set to 3–20 mm apart along two side costae; basal leaflets to 15 × 0.8 cm; mid-lamina leaflets to 32 × 2.7 cm, the tips often with a brittle mucro to 1.5 cm long; apical leaflets to 25 × 1.0 cm, smaller, rudimentary leaflets occasionally present. Staminate inflorescence erect, to 70 cm long, with up to 14 partial inflorescences spaced to 4–8 cm apart, decreasing in size distally; peduncle c. 10 × 1.3 cm to the prophyll scar, flattened and 2-keeled, covered with reddish-brown indumentum and armed with rigid laminar spines to 1.5 cm long; prophyll c. 32 × 2 cm, ± woody-textured, but brittle when dry, very densely covered with reddish-brown indumentum, only sparsely armed with short spines to 8 mm and mainly along edges, splitting down middle portion; other primary bracts decreasing in size distally, ± armed as the prophyll but even more sparsely so, covered with indumentum as the prophyll; prophyll and other primary bracts subtending a partial inflorescence, all caducous at anthesis; basal partial inflorescence to 10 cm long with up to 12 crowded rachillae, each 2.5–3.0 cm long × 0.6 cm wide, subtended by a persistent bract with a distinct triangular limb to 1.5 cm long, often tattering, each rachilla bearing up to 15 distichously arranged bracts, each subtending a flower, alveolus of flower to 3 mm dia., apical partial inflorescence simple, unbranched. Staminate flower to 6 × 3 mm, cylindrical in bud; calyx greenish, 3-lobed, with basal tube to 3 mm, and triangular lobes to 1.5 mm; corolla yellowish-brown, with short basal tube and 3 petals to 5 × 2.5–3.0 mm; stamens 6 with free filaments, white, to 6 mm long at anthesis, anthers yellow to 3 × 1 mm; pistillode to 2 mm long, trifid. Pistillate inflorescence as the staminate but more robust, peduncle slightly longer, and prophyll does not subtend a partial inflorescence; whole inflorescence arching when in fruit; rachilla c. 4 × 0.8 cm, covered with reddish-brown indumentum, rachilla bracts with a prominent triangular limb to 6 mm; alveolus of sterile staminate flower c. 2 mm

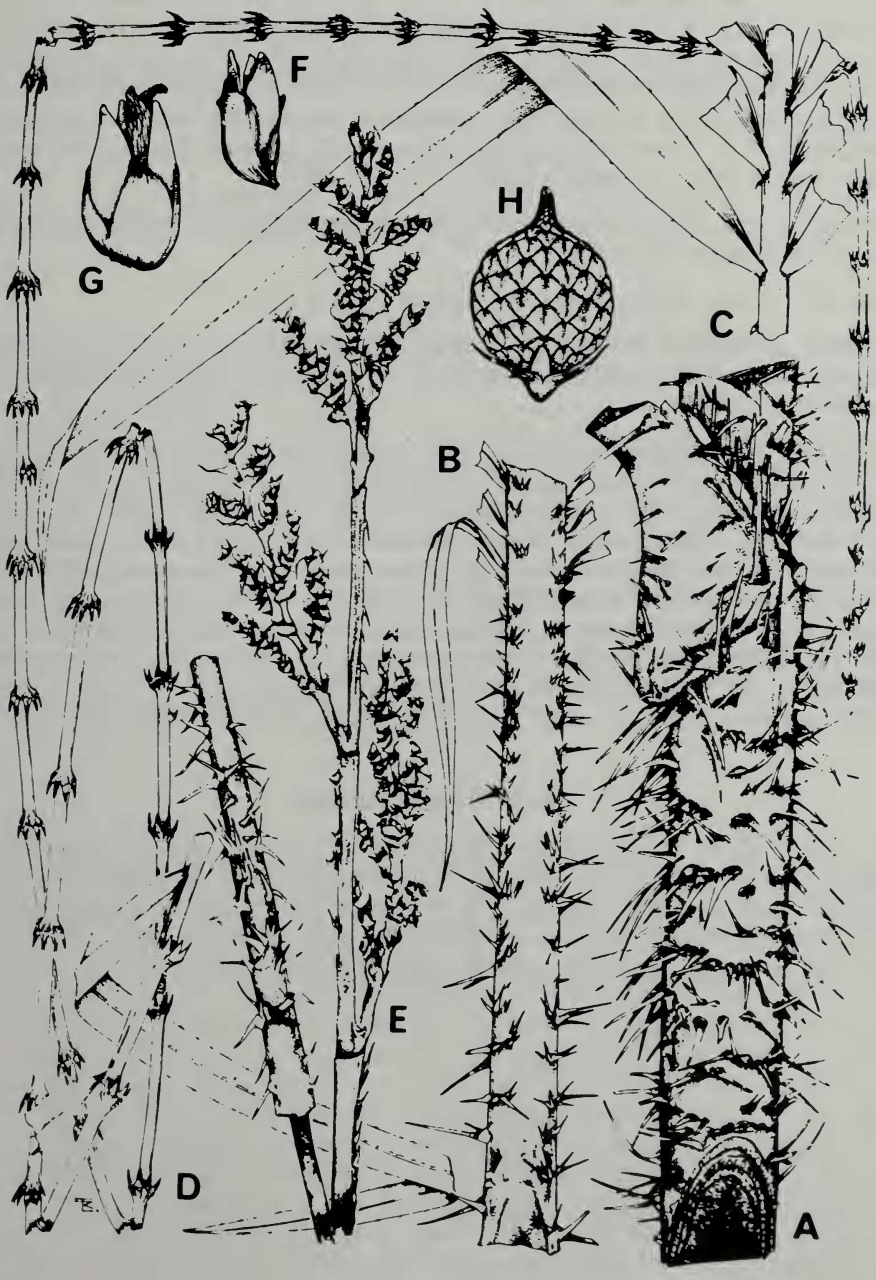

Fig. 4. *Daemonorops polita* E. Fern. — A. sheathed stem, ×2/5; B. petiole, ×2/5; C. mid-portion of leaf, ×2/5; D. leaf apex with cirrus, ×2/5; E. portion of infructescence, ×2/5; F. sterile staminate flower, ×3; G. pistillate flower, ×3; H. immature fruit, ×1 1/4. All from *Fernando 575.*

dia., that of pistillate flower c. 5 mm dia. Sterile staminate flower as the fertile but with undeveloped anthers. Pistillate flower c. 8 × 4 mm; calyx tubular in basal 4 mm with three triangular lobes to 2 × 2.5 mm; corolla with basal tube to 2 mm and three petals to 4 × 3 mm; staminodal ring bearing 6 teeth to 2 mm long; ovary c. 3 × 2.5 mm with three reflexed stigmas to 2 mm long. Fruit (immature) globose, c. 1.3 × 1.4 cm, tipped with a beak to 5 mm; pericarp with 15 vertical rows of glossy, yellowish scales with prominent reddish-brown margins and mid-scale groove. Seed globose, c. 1 × 1 cm; endosperm ruminate; embryo basal. Seedling leaf (eophyll) pinnate with 6 pairs of leaflets, each c. 40 × 4 mm.

Distribution and Habitat: Mindanao (Zamboanga Peninsula); in dipterocarp forest at c. 600–800 m alt. Endemic.

Vernacular name: Lapa-utong.

Specimens Examined: Mindanao: Zamboanga Peninsula, La Paz, *Fernando 575* (holotype LBC; isotypes BH, K), *Fernando 719* (BH, K, LBC), Kabasalan, Dipala Mt, *Ebalo 771* (BH).

This new species clearly belongs to Section *Piptospatha* and is most closely similar to *D. ruptilis* Becc. var. *ruptilis* of Borneo in the inflorescence structure and in the persistent, often splitting secondary and tertiary bracts. It is, however, distinguished by its generally solitary habit, in the leafsheath armed with broader-based laminar spines arranged in partial whorls, in the more conspicuous knee, in the more closely set regular arrangement of the leaflets, in the leaflets bristly on three nerves on the undersurface, and in the more rounded fruit. *D. polita* is also similar to *D. ruptilis* Becc. var. *acaulescens* Dransf. in the inflorescence structure and in the shape and glossiness of the fruit but the habit is quite different.

The specific epithet refers to the polished, glossy scales of the fruit.

Acknowledgements

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