

basal leaflets to  $25 \times 1.0$  cm; mid-lamina leaflets to  $49 \times 2.2$  cm, apical leaflets to  $5.5 \times 0.3$  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  $20 \times 1.8$  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.  $12 \times 1$  cm to the prophyll scar; partial inflorescence to 35 cm long, bearing to 20 tubular bracts, each to  $13 \times 8$  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  $40\text{--}90 \times 3$  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.  $7 \times 6$  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  $35 \times 2$  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 discoloured 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, pleoanthic, 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

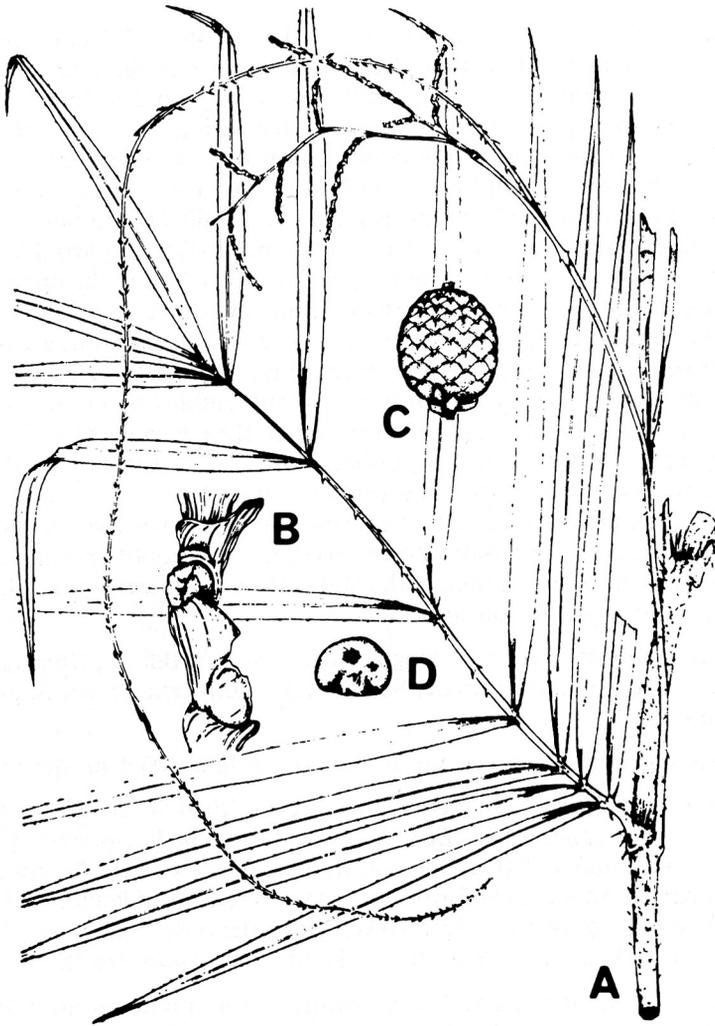


Fig. 2. *Calamus balerensis* E. Fern. — A. sheathed stem with one leaf and old infructescence,  $\times 1/2$ ; B. detail of rachilla,  $\times 6$ ; C. fruit,  $\times 1 1/4$ ; D. seed,  $\times 1 1/4$ . All from Fernando 478.

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  $16.8 \times 0.7$  cm, mid-lamina leaflets to  $18.4 \times 0.8$  cm; apical leaflets to  $1.2 \times$

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  $17 \times 0.3$  cm, armed with scattered short, black, rigid spines to 2 mm; other bracts similar but decreasing in size distally; peduncle c.  $16 \times 0.2$  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  $25\text{--}35 \times 2$  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  $1.5 \times 1$  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  $1 \times 1.2 \times 0.8$  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, *Hernaes 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, pleoanthic, 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.