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The Mottled-leaved Species of Pinanga in the Philippines

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Of the more than 20 species of *Pinanga*, thus far recorded for the Philippines (Beccari 1919, Merrill 1922), three endemic species, viz. *P. maculata*, *P. copelandii* and *P. curranii*, are known to exhibit mottling in their leaves; a fourth species, *P. bicolana*, is described here for the first time. Several other species of *Pinanga* from Malay Peninsula, Sumatra and Borneo are also known to display mottling in their leaves (Dransfield 1974). The mottling of the leaves makes the species doubly attractive as palms for cultivation. It is usually more prominent and conspicuous in seedlings or juvenile plants, although in some species adult, fruiting plants may continue to show variegation.

The four Philippine species of *Pinanga* with mottled leaves may be keyed out as follows:

1. Leaflets ± straight, not or only shallowly incised at the apex, densely pubescent-scaly underneath; calyx of fruiting perianth with free imbricate lobes ..... 1. *P. curranii*
1. Leaflets ± cuneiform-sigmoidal, conspicuously and deeply incised at the apex, ashy-grey puberulous underneath; calyx of fruiting perianth with valvate lobes joined at their bases 2
2. Inflorescence with flowers or fruits arranged spirally along the rachillae ..... 2. *P. maculata*
2. Inflorescence with flowers or fruits arranged distichously along the rachillae 3
3. Fruit obovoid to subturbinate, shortly beaked, epicarp drying finely striate; rachillae in inflorescence often more than 8 ..... 3. *P. copelandii*
3. Fruit oblong-ellipsoidal, prominently beaked, epicarp drying smooth and crustaceous; rachillae in inflorescence rarely more than 8 ..... 4. *P. bicolana*

1. **Pinanga curranii** Becc. in Philipp. J. Sci. (Bot.) 2: 226 (1907), 14: 320 (1919); Merrill, Enum. Philipp. Fl. Plts. 1: 165 (1922); Martelli in Nuov. Gior. Bot. Ital. (n.s.) 42: 67 (1935). Type: Palawan, Puerto Princesa, *Curran F.B. 3515* (Holotype FI).

Iguanura sp., Vidal exsicc. No. 1945, Vidal, Rev. Pl. Vasc. Filip. 279 (1886); Ceron, Cat. Pl. Herb. Rec. Per. Sup. Com. Fl. For. 174 (1892).

Pinanga maculata sensu Becc. non Porte ex. Lem. in Perkins, Fragm. Fl. Philipp. 1: 48 (1904), in Webbia 1: 325 (1905) (in part), in Philipp. J. Sci. (Bot.) 14: 317 (1919); Merrill, Enum. Philipp. Fl. Plts. 1: 166 (1922).

Clustering, rarely solitary, moderate to large palm to 8 m tall. Stem ca. 5–10 cm diam., internodes ca. 4–10 cm long. Crownshaft elongate, cylindrical, slightly swollen, to 90 cm long. Leaves to 7 in crown; leafsheath ca. 40–80 cm long, dark green, covered with fugaceous brown tomentose scaly indumentum; leaf without sheath 1.5–2 m long; petiole ca. 18 × 1.2 cm, channelled above, convex below, covered with indumentum as the leafsheath; rachis angular, ± bifacial above, indumentum as the leafsheath and petiole. Leaflets to 26 on each side of the rachis, unequal, inequidistant, to 4 cm apart, dark green above and with sharply edged costae, greyish-green or paler underneath and densely covered with pubescent, tomen-

tose-scaly indumentum; basal leaflets 3–4 costate, ca. 46–62 × 3.5–4.3 cm, ± straight or only slightly sigmoidal, the apex long-acuminate, subfalcate; middle leaflets 2–3 (4) costate, ca. 64–100 × 4–5 cm, ± straight, long-acuminate at apex; subterminal and terminal leaflets incised at apex to as many lobes as there are costae, the lobes to 2 cm long and further incised at their tips to 5 mm deep, resulting secondary lobes obtuse or rounded and convergent, becoming hook-shaped; terminal leaflet pair to 10-costate, ca. 25 × 7 cm, joined to 17 cm at the base along the rachis. Inflorescence infrafoliar, pendulous; prophyll elliptic-ensiform, 2-keeled, 26 × 6 cm, drying rusty brown, caducous; peduncle 2.5–6 × 1.0–1.5 cm, flattened, glabrous; inflorescence axis to 10 cm long, tapering distally; rachillae 13–20, deflexed, not strictly distichous, borne 0.5–1.5 cm apart, each 18–27 cm long, flattened, to 4 mm wide, 2–2.5 mm thick when dry, glabrous, the subtending bract narrowly semi-annular, apiculate in the middle, to 2 mm; triads borne distichously along the rachilla. Staminate flower triangular, trigonous, asymmetrical, 6 × 4.5 mm; sepals 3, unequal, fused at the very base, dorsally keeled, flexuous, long-acuminate, 3 × 1 mm; petals 3, unequal, valvate, ± ovate-lanceolate, 6 × 4.5 mm; stamens to 25; anthers basifixed, 3 × 0.5 mm; filaments very short or sessile. Pistillate flower depressed-globose, 1.5 × 1.5 mm, sepals ± as long as the petals; sepals 3, free, unequal, imbricate, ± rounded at tips, 1.0 × 1.5 mm; petals ± narrower than sepals, slightly dorsally keeled, ciliolate along the margins; ovary shortly oblong to rounded, 1 × 1 mm, tipped with an irregularly lobed stigma. Fruiting perianth depressed-cupular, to 3 mm high, 6 mm across, with a flat base and slightly broadened mouth; the sepals and petals subequal, the sepals with free, imbricate lobes, subtending bract broadly ovate to 1.5 mm long. Fruit distichous, 5–10 mm apart, ripening deep red, ovoid to oblong-ellipsoidal, ca. 1.5 × 1.0 cm, apiculate at apex; epicarp drying sparsely and finely striate; mesocarp not loosely fibrous; seed ovoid to oblong, 1.0–1.2 × 0.8–0.9 cm, apiculate at tip, obtuse to rounded at base; endosperm ruminate; embryo sub-basal.

Distribution and Habitat: Philippines: Palawan, Dumaran and Busuanga Islands; in forests, ca. 10–500 m alt. Endemic.

Vernacular Name: "Bunga-bunga."

Specimens Examined: PALAWAN: Puerto Princesa, *Curran F.B. 3515* (Holotype FI), Bagumbayan, *Fernando 637* (K, LBC), *Hernaez 3647* (CAHP), Iwahig River, *Merrill 712* (FI), Tagkauarim, *Madulid 1018* (K), St. Paul's Bay, Kabayugan, *Madulid & Dransfield 1038* (K).—DUMARAN IS: *Vidal 1945* (K).—BUSUANGA IS: *Ramos B.S. 41240* (K).

2. **Pinanga maculata** Porte ex Lem. in Illus. Hort. 10: pl. 361 (1863); Drude in Bot. Zeit. 40: 637 (1877); H.A. Wendl. in Kerch. Les Palms. 253 (1878); Becc., Malesia 3: 145 (1886), in Webbia 1:325 (1905) (in part); Furtado in Feddes Rep. 35: 281 (1934) (in part and excl. syn. *P. copelandii* Becc.); Martelli, in Nuov. Giorn. Bot. Ital. (n.s.) 42: 69 (1935); Moore in Principes 7: 158 (1963). Type: pl. 361 in Lem., l.c.

Ptychosperma maculatum (Porte ex Lem.) Seem. in Gard. Chron. 697 (1870).

Iguanura sp., Vidal exsicc. No. 1954, Vidal Rev. Pl. Vasc. Filip. 279 (1886); Ceron, Cat. Pl. Herb. Rec. Pers. Sup. Com. Fl. For. 174 (1892).

Pseudopinanga maculata (Porte ex Lem.) Burret in Notizbl. Bot. Gard. Mus. Berlin-Dahlem 13: 194 (1936) (in part, excl. *P. copelandii* Becc. and all specimens cited); Salvosa, Lexicon Philipp. Trees 120 (1963).

Pinanga barnesii Becc. in Webbia 1: 320 (1905), in Philipp. J. Sci. (Bot.) 3: 340 (1908), 6: 229 (1911), 14: 320 (1919), in Leafl. Philipp. Bot. 8: 3002 (1919);

Merrill, Enum. Philipp. Fl. Plts. 1: 164 (1922); Martelli in Nuov. Gior. Bot. Ital. (n.s.) 42: 66 (1935); Jones, Palms Austral. 223 (1984). Type: Luzon, Bataan Prov., Lamao River, *Barnes F.B. 122* (Holotype FI; Isotype K). **synon. nov.**

Pseudopinanga barnesii (Becc.) Burret in Notizbl. Bot. Gart. Mus. Berlin-Dahlem 13: 193 (1936); Salvosa, Lexicon Philipp. Trees 120 (1963).

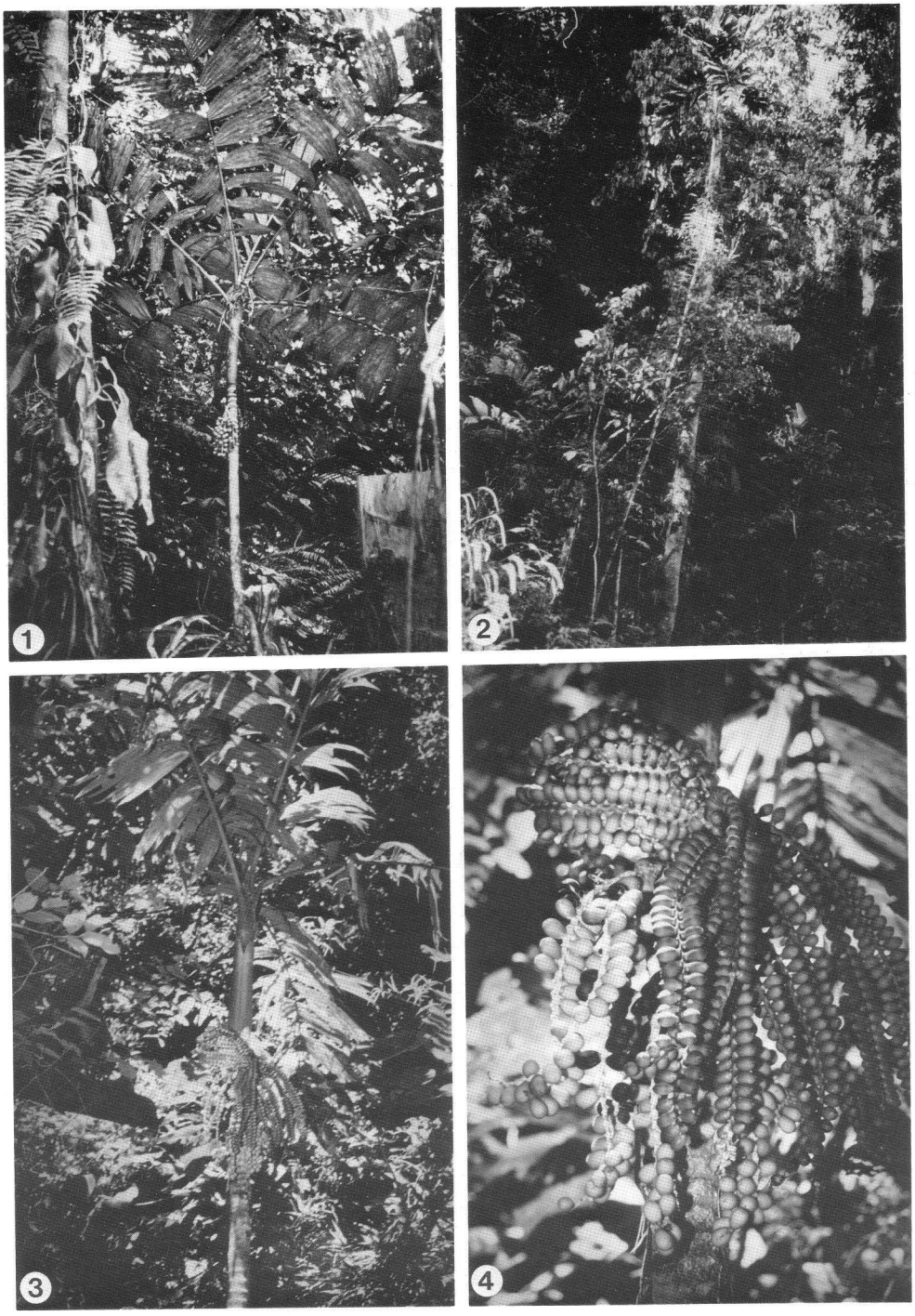
Pinanga barnesii Becc. var. *macrocarpa* Becc. in Philipp. J. Sci. (Bot.) 2: 227 (1907). Type: Mindoro, Balete, Baco River, *McGregor 275* (Holotype FI; Isotype K).

Solitary, moderate palm to 5 m tall. Stem ca. 3–5 cm diam., internodes to 3 cm long. Crownshaft elongate, slightly swollen, to 50 cm long. Leaves to 7 in crown; leafsheath ca. 40 cm long, purplish-brown to light orange, covered with brown scaly indumentum; leaf without sheath ca. 1.5–2 m long; petiole ca. 3–17 cm long, slightly channelled above, convex below, covered with brown scaly indumentum as leafsheath; rachis angular, ± bifacial above, obtusely rounded below, covered with brown scaly indumentum as leafsheath and petiole. Leaflets to 15 on each side of the rachis, unequal, inequidistant, ca. 5–12 cm apart, the apex incised to as many lobes as there are costae, dull dark green above and mottled with large, irregular blotches of lighter shade, ashy-grey puberulous underneath; the costae above distinctly and sharply elevated, those beneath covered with contiguous ramenta; basal leaflets 2-costate, ca. 16–27 × 1–1.5 cm, sigmoidal, long-acuminate at tips; middle leaflets usually 4–7 costate, ca. 28–54 × 7–12 cm, ± sigmoidal, cuneiform, narrowed towards the base, apical lobes falcate-acuminate, pendulous, ca. 6–19 cm long, generally ⅕ to ¼ of leaflet length, rarely more; terminal leaflet pair to 13-costate, ca. 15 × 3.5 cm, the pair joined to 19 cm at the base along the rachis, apical lobes to 4.5 cm long, falcate-acuminate. Inflorescence infrafoliar, pendulous; prophyll not known; peduncle ca. 2–6 × 0.7–1.5 cm, flattened, 5–7 mm thick, reddish to orange when fresh; rachilla usually 4–5, rarely more, borne ca. 2–3 cm apart, each ca. 18–35 cm long, angular, ± twisted, sinuous, 4–6 mm thick, reddish to orange when fresh, the subtending bract a narrow, semi-annular collar; triads borne spirally in 3 series along the rachilla. Staminate and pistillate flowers not known. Infructescence pendulous. Fruiting perianth depressed-cupular with a broadened mouth, to 3 mm high, 8 mm across; the sepals and petals subequal, glabrous, dirty reddish-brown; sepals 3, valvate, joined at their bases; petals 3, free, imbricate, slightly broader than the sepals; subtending bract a low, explanate, semi-annular collar, almost inconspicuous. Fruits spirally arranged in 3 series, densely clustered, ripening red then purplish-black, ovoid-ellipsoidal to ellipsoidal, ca. 2.1–2.8 × 1.2–1.6 cm, the apex shortly beaked; epicarp drying wrinkled with shallow depressions; mesocarp fibrous; seed globose-ovoid to ovoid, ca. 1.2–1.3 × 0.9–1.2 cm, rounded at tip, slightly obliquely truncate at base; endosperm ruminate; embryo basal.

Distribution and Habitat: Philippines: Luzon, Polillo and Mindoro; in humid forests, ca. 300–800 m alt. Endemic. Merrill (1922) also reports this species (as *P. barnesii*) from Catanduanes, Panay, Siargao and Mindanao in primary forests to 1,600 m alt. (Fig. 1).

Vernacular Names: "Abiki" (Tagalog), "Gahiddan qan bittulung" (Ifugao), "Tigbisa" (Dumagat) (see also Merrill 1922: 164 for other local names).

Specimens Examined: LUZON: Cagayan Prov., *Ramos B.S. 13858* (K); Ifugao Prov., Damag, *Fernando 355* (K, LBC), Botwag, *Conklin & Buwaya 2525* (K); Benguet Prov., Baguio, *Elmer 8850* (K); La Union Prov., Mt. Tonglon, *Loher 7067* (K); Zambales Prov., Pinagtubo, *Loher 7068* (K); Aurora Prov., Sierra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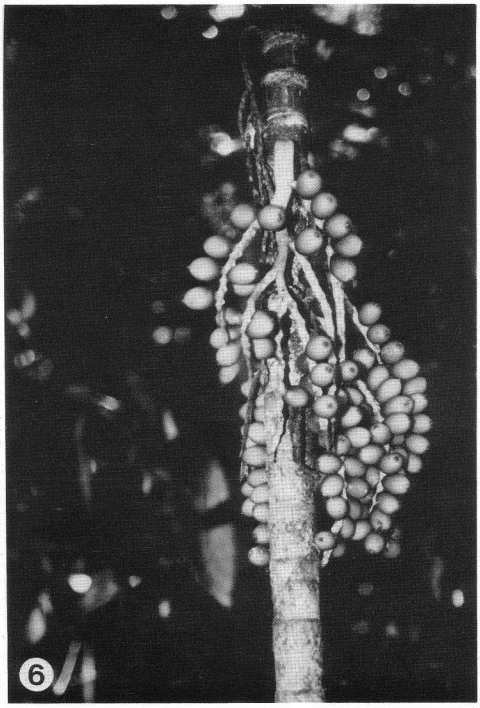


1. *Pinanga maculata*, habit, Sierra Madre Mts., Aurora Prov., Luzon, April 1985. 2. *Pinanga copelandii*, in the forest near Malayal, Zamboanga del Norte Prov., Mindanao, July 1986. 3. *Pinanga copelandii*, in the forest around Lake Bulusan, Sorsogon Prov., Luzon, July 1985. 4. *Pinanga copelandii*, infructescences with fruits at various stages of maturity, same plant as in Fig. 3. 5. *Pinanga bicolana*, type plant showing habit, Bicol National Park, Camarines Norte Prov. Luzon, May 1985. 6. *Pinanga bicolana*, infructescences with nearly mature fruits, same plant as in Fig. 5.

Madre Mts., *Fernando 471* (K, LBC), *Fernando 565* (LBC), *Jacobs 7759* (K); Quezon Prov., Nakar, Sablang, *Fernando 520* (LBC), Mt. Banahaw, *Dransfield et al. 5476* (K, LBC), Dolores, *Vidal 1954* (K), Lucban, *Elmer 7924* (BM, K), Real, *Fernando 551* (LBC), *Hernaez 3566, 3568* (CAHP), Infanta, *Loher 1357* (in part) (K); Tayabas, *Elmer 9297* (BM), Atimonan, Quezon National Park, *Hernaez 3590* (CAHP), *Natividad 001* (LBC); Laguna Prov., *Mabesa F.B. 26782* (K); Bataan Prov., Lamao, *Barnes F.B. 122* (Type of *Pinanga barnesii* Becc.; Holotype FI); Rizal Prov., Mt. Tokduanbanoy, *Ramos & Edaño B.S. 48600* (in part) (K), Montalban, *Loher "7067"* (K), Tanay, Morong, *Loher 1395* (in part) (K).—POLILLO: *McGregor 10466* (K), *Robinson B.S. 6937* (BM, K).—MINDORO: Pinamalayan, *Ramos B.S. 40970* (K), Baco River, *McGregor 275* (Type of *Pinanga barnesii* Becc. var. *macrocarpa* Becc.; Holotype FI; Isotype K).

The identity of *P. maculata* remained obscure for many years since publication, as it was typified only by a description and illustrated based on a sterile, juvenile plant which was then cultivated in a nursery in Belgium. The source of the plant was said to be the Horticultural Society then existing in Moscow, but the specimen was originally collected in the Philippines by Marius Porte in humid forest between 1,200–1,500 ft (ca. 365–457 m) above sea level (Lemaire 1863*b*).

In 1934, Furtado considered the problem of the identity of *P. maculata* and

concluded that Porte's species was conspecific with *P. copelandii* Becc. In his paper, Furtado (1934) writes ... "*P. copelandii* is a palm widely distributed in the Philippines being found up to a height of 1220 m. In view of this it appears that the plant *P. copelandii* Becc. should be known as *P. maculata* Porte ex Lem." However, Furtado had overlooked another species closely related to *P. copelandii* and which until now was known as *P. barnesii* differing from the former only in its inflorescence and fruit structure.

P. barnesii occurs in the Babuyan Islands, Luzon (numerous localities), Polillo, Catanduanes, Mindoro, Panay, Siargao and Mindanao (Beccari 1919, Merrill 1922). *P. copelandii*, on the other hand, is known only from Basilan, Mindanao, Negros, Bohol, Leyte and from two localities in the southeastern peninsular region of Luzon (Beccari 1919, Merrill 1922). Another closely related species, *P. bicolana* (described below), is found, so far, only in two adjacent localities in southeastern Luzon. *P. barnesii* is, thus, the more widely distributed species compared with *P. copelandii*. It is, indeed, very common in Luzon and is the only species of the four with mottled leaves that occurs in the provinces close to Manila, i.e. Laguna, Rizal, Bataan, Quezon and Pampanga. I have not seen *P. copelandii* or collections of it from elsewhere in Luzon other than in the above-mentioned localities.

M. Porte, a French explorer, is known to have collected from ca. 1858–1865 near Singapore and in the Philippines (Lemaire 1863*a*, Backer 1936, van Steenis-Kruseman 1950). Although it is not mentioned in the original publication (Lemaire, 1863*b*) specifically where in the Philippines Porte collected his specimen of *P. maculata*, it is, however, almost certain that he made his collections in Luzon near Manila from where he is also known to have discovered the orchid *Phalaenopsis schilleriana* Reichb.f. (Lemaire 1863*a*). Apparently in those times Manila was generally regarded as synonymous with Luzon (see Lemaire 1863*a*, 1866) and the nearby provinces around it were obviously the most easily accessible areas for plant collection. Moreover, there is no mention of Porte having collected in Mindanao or Palawan or elsewhere in Luzon.

What Porte collected in the Philippines as *P. maculata* therefore, was almost certainly from Luzon and was the same plant which was later to be named as *P. barnesii*. *P. maculata* is the earlier and thus correct name.

Following Moore (1973) and Dransfield (1980), I do not consider *Pseudopinanga* created by Burret (1936) as a distinct genus.

The plant illustrated by Wright (1905) as *P. maculata* based on a specimen from the Malay Peninsula and cultivated at Kew was identified by Ridley (1907) as *P. disticha* (Roxb.) Blume ex H.A. Wendl. under which he actually, although incorrectly, reduced *P. maculata* as a synonym. Wright's (1905) plant, however, is certainly not the true *P. maculata* from the Philippines.

The collection by Merrill (No. 712) from Palawan (a juvenile plant with mottled leaves) cited by Beccari (1904, 1905, 1919) and Merrill (1922) as *P. maculata* is, in fact, a specimen of *P. curranii* as has already been hinted by Furtado (1934). True *P. maculata* has, so far, not been recorded from Palawan.

3. **Pinanga copelandii** Becc. in Webbia 1: 320 (1905), in Philipp. J. Sci. (Bot.) 14: 320 (1919), in Leafl. Philipp. Bot. 8: 3002 (1919); Merrill, Enum. Philipp. Fl. Plts. 1: 165 (1922); Martelli in Nuov. Gior. Bot. Ital. (n.s.) 42: 67 (1935). Type: Mindanao, Davao Prov., Todaya, Mt. Apo, *Copeland 1283* (Holotype FI).

Pinanga maculata sensu Furtado non Porte ex Lem. in Feddes Rep. 35: 281 (1934) (in part); Jones, Palms Austral. 226 (1984).

Pseudopinanga maculata (Porte ex Lem.) Burret in Notizbl. Bot. Gart. Mus. Berlin-Dahlem 13: 194 (1936) (in part).

Solitary, moderate to large palm to 7 m tall. Stem ca. 10 cm diam., internodes to 12 cm long. Crownshaft elongate, cylindrical, swollen, to 1 m long. Leaves to 6 in crown; leafsheath to 65 cm long, dull green, covered with brown, scaly indumentum; leaf without sheath to 3 m long; petiole ca. 30–64 × 1.5–2.0 cm, ± rounded, shallowly channelled above, covered with brown, scaly indumentum; rachis angular, bifacial above, ± flattened to rounded below, glabrous to slightly brown-scaly. Leaflets to 13 on each side of the rachis, unequal, inequidistant, 3–9 cm apart, the apex incised to as many lobes as there are costae, dull dark green above and sometimes slightly mottled, pale and ashy-puberulous glaucuous underneath, often drying brittle and delicate, the costae above elevated and flattened to 3 mm wide and rather sharply-edged, the costae below covered with brown, scaly indumentum; basal leaflets 2–3 costate, ca. 30 × 2.5 cm, ± sigmoidal, long acuminate at tips; middle leaflets 1–8 costate, ca. 41–80 × 7–14 cm, ± sigmoidal, cuneiform, narrowed towards the base, the apical lobes ca. 4.5–23 cm long, generally to ¼ of leaflet length, rarely more, falcate-acuminate, pendulous, sometimes further incised at their tips to 1.5 cm deep; terminal leaflet pair to 13-costate, ca. 22 × 18 cm, joined to 17 cm at their base along the rachis, apical lobes 3–4 cm long, falcate-acuminate, sometimes further incised at their tips to 1 cm deep. Inflorescence infrafoliar, pendulous; prophyll not known; peduncle ca. 5 × 1.5 cm, flattened, to 7 mm thick, glabrous green, becoming yellow to orange when fresh; the main axis to 15 cm long or more, ± appearing zigzag when dry; rachillae 9–14, rarely less, ± reflexed or slightly bent backwards near point of attachment, distichous, ± in the same plane, borne ca. 3 cm apart, each ca. 9–31 cm long, flattened, to 5 mm wide, 3 mm thick when dry, light green, becoming orange when fresh, glabrous, drying light brown and distinctly striate, the subtending bract semi-annular, apiculate, to 3 mm in the middle; triads borne strictly distichously along the rachilla. Staminate and pistillate flowers not known. Infrutescence pendulous. Fruiting perianth cupular, to 3 mm high, 7 mm across, with a broadened mouth; the sepals and petals ± equal, glabrous, finely striate dorsally, drying orangish-brown; the sepals valvate, joined at their bases; the petals free, imbricate; the subtending bract a low, semi-annular collar. Fruits distichous, to 7 mm apart, ripening red then purplish-black, obovoid to subturbinate, narrowed towards the base, ca. 2.0–2.5 × 1.0–1.3 cm, the apex shortly beaked; epicarp drying finely striate, rather thin; mesocarp loosely fibrous; seed shortly oblong to spherical, ca. 1.0–1.2 × 0.8–1.0 cm, rounded or sometimes shortly apiculate at tip, obliquely shallowly concave-truncate at base; endosperm deeply ruminate; embryo basal.

Distribution and Habitat: Philippines: Luzon (Camarines and Sorsogon provs.), Bohol, Leyte, Mindanao, and Basilan; in humid forests ca. 100–1,250 m alt. Endemic. Merrill (1922) also reports this species from Negros Is. (Figs. 2–4).

Vernacular Names: "Timbagnalan" (Bagobo), "Bagtoan" (Manobo).

Specimens Examined: LUZON: Camarines Prov., *Ramos Phil. Plts. 1594* (BM, FI); Sorsogon Prov., Irosin, Mt. Bulusan, *Elmer 15497* (BM, K), Bulusan Lake, *Fernando 542* (K, LBC), *Hernaez 3630* (CAHP).—BOHOL: *Ramos B.S. 42874* (BM).—LEYTE: Baybay, Mt. Pangasugan, *Reyes 1102* (CAHP).—MINDANAO: Agusan Prov., Butuan, *Weber 1134* (K), *Fenix B.S. 15918* (BM), Agusan River, *Merrill 7281* (BM), Cabadbaran, Mt. Urdaneta, *Elmer 13875* (BM, K), Trento, *Fernando 413* (K, LBC); Davao Prov., Todaya, Mt. Apo, *Copeland 1283* (Holotype FI), *Elmer 10467* (BM, K);

Zamboanga del Norte Prov., Malayal, *Fernando 585* (K, LBC); Zamboanga del Sur Prov., Malangas, *Ramos & Edaño B.S. 36880* (BM, K), localities unknown, *Brown B.S. 38366* (in part) (K), *Hernaez 3666* (CAHP).—BASILAN: Maligui, *Fernando 615* (LBC).

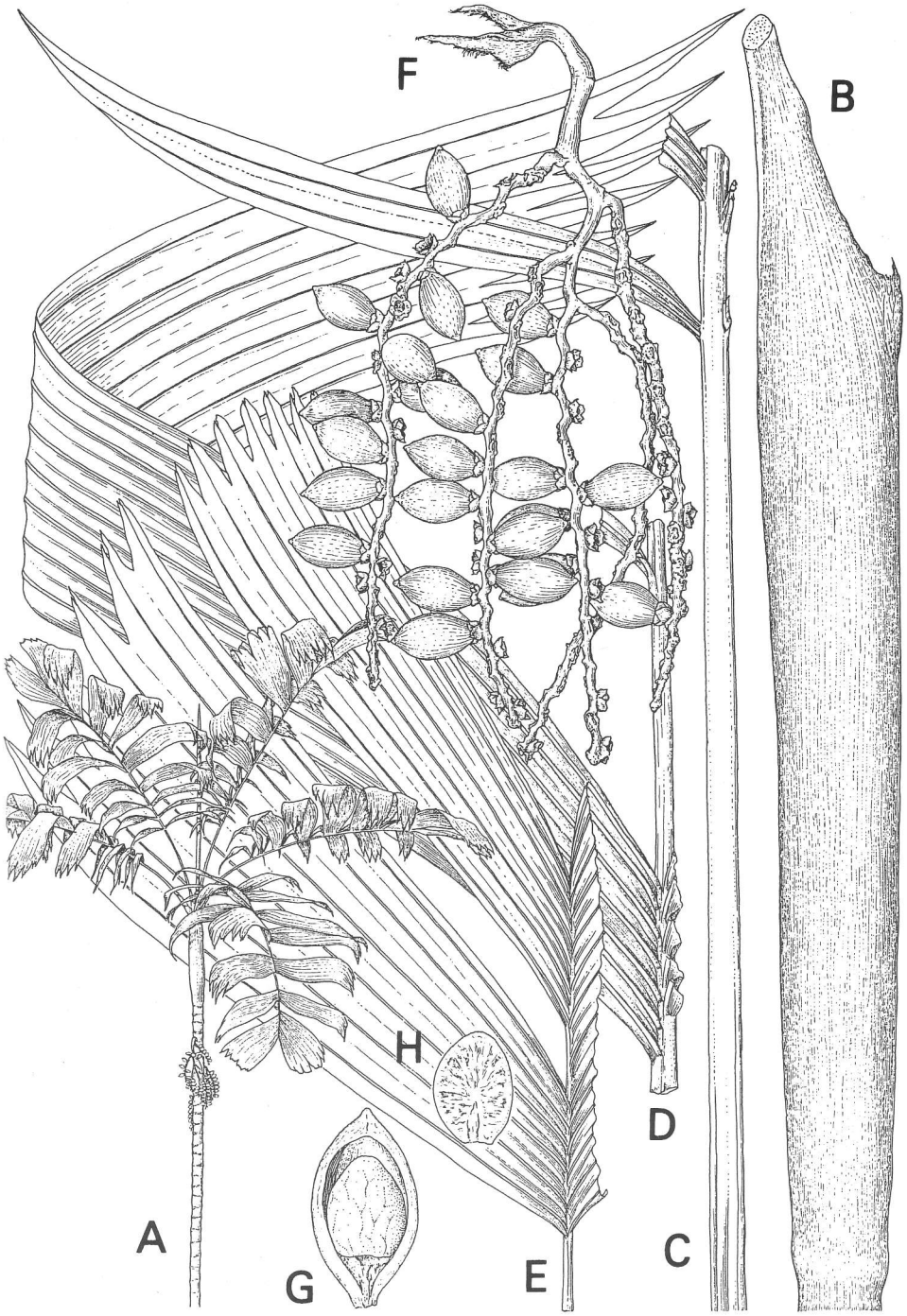
4. **Pinanga bicolana** E. Fern., *sp. nov.* *P. copelandii* Becc. affinis, a qua imprimis fructu oblongo-ellipsoideo, epicarpio siccitate laeve et crustaceo, inflorescentiae rachillis 5–8 differt. Typus: Philippines, Luzon, Camarines Norte Prov., Bicol National Park, *Fernando 498* (Holotypus K; Isotypus LBC) (Figs. 5–7).

Solitary, moderate, unarmed, pleonanthic, monoecious palm to 3 m tall. Stem ca. 4 cm diam., internodes to 6 cm long. Crownshaft elongate, cylindrical, slightly swollen, to 60 cm long. Leaves 5–6 in crown; leafsheath ca. 42 cm long, dull light green, covered with dense, brown, scaly indumentum; leaf without sheath 75–100 cm long; petiole ca. 25 × 1.3 cm, channelled above, convex below, covered with indumentum as the leafsheath; rachis angular, bifacial above, obtusely rounded below, covered with indumentum as the leafsheath and petiole. Leaflets to 10 on each side of the rachis, unequal, inequidistant, to 6 cm apart, the apex incised to as many lobes as there are costae, dull dark green above and slightly mottled with blotches of lighter shade, ashy puberulous-glaucous underneath, the costae above sharply edged, those beneath covered with brown scaly indumentum; basal leaflets generally unicostate, ca. 17 × 1 cm, ± sigmoidal, long-acuminate; middle leaflets 1–6 costate, ca. 40 × 8 cm, ± sigmoidal, cuneiform, narrowed towards the base, apical lobes acuminate-falcate, pendulous, to ca. 7.0–8.5 cm long, generally about ⅛ of leaflet length; terminal leaflet pair to 14-costate, ca. 18.5 × 12.5 cm, the pair joined to 14 cm at the base along the rachis, apical lobes falcate-acuminate, to 3.5 cm long. Inflorescence infrafoliar, pendulous; prophyll not known; peduncle ca. 5 × 0.8 cm, flattened, ca. 3–4 mm thick, glabrous, light green becoming orange when fresh; main axis to 8 cm long, tapering distally, ± zigzag when dry; rachillae 5–8, very rarely more, deflexed, distichous, ± in the same plane, borne 3–4 cm apart, each ca. 9–14 cm long, flattened, to 4 mm wide, 3 mm thick when dry, light green becoming orange when fresh, the subtending bract a narrow low collar; triads borne strictly distichously along the rachilla. Staminate and pistillate flowers not known. Infructescence pendulous. Fruiting perianth depressed-cupular, 3 mm high, 7 mm across, with a broadened mouth; the petals and sepals subequal, glabrous, drying dark brown; sepals valvate, joined at their bases; petals free, imbricate, broader than the sepals; subtending bract as a low explanate, semi-annular collar, almost inconspicuous. Fruits distichous, to 8 mm apart, ripening red then purplish-black, oblong-ellipsoidal, ca. 2.2 × 1.4 cm, prominently beaked or mammilate, with a collar to 2 mm high and 3 mm wide near the base surrounding the apical stigmatic remains; epicarp drying smooth, sometimes with shallow depressions, rather thick and crustaceous; mesocarp loosely fibrous; seed broadly ovoid, ca. 9.5 × 9.0 mm, rounded at tip, shallowly concave-truncate at base; endosperm ruminate, embryo basal.

Distribution and Habitat: Philippines: Luzon (Camarines Norte and Sur provs.); in dipterocarp forest ca. 100–200 m alt. Endemic.

Specimens Examined: LUZON: Camarines Norte Prov., Bicol National Park, *Fernando 464* (LBC), *Fernando 498* (Holotype K; Isotype LBC), *Fernando 562* (BH, K, LBC), *Hernaez 3585, 3587* (CAHP), *Pancho & Hernaez 3453* (CAHP), *Reyes & Pancho 1059* (CAHP); Camarines Sur Prov., Lupe, *Pancho 2489* (CAHP).

This species is closely related to *P. copelandii* in the distichously arranged fruits along the rachilla but is easily distinguished



7. *Pinanga bicolana* E. Fern. A, habit, ×1/20; B, leafsheath, ×1/2; C, basal portion of leaf with petiole and first leaflets, ×1/2; D, mid-portion of leaf, ×1/2; E, apical portion of leaf, ×1/2; F, infructescence, ×1/2; G, vertical section of fruit, ×1; H, vertical section of seed, ×1. All from *Fernando 498*. Drawn by E. A. Lapitan.

by its prominently beaked, oblong-ellipsoidal fruits with the epicarp drying smooth and rather crustaceous. The inflorescence bears rarely more than 8 deflexed rachillae.

P. bicolana together with *P. maculata* and *P. copelandii* belong to a distinct group within *Pinanga* in bearing united sepals in their pistillate flowers. Within that group they form an unusual subgroup in having broad, pluricostulate leaflets which are ashy-grey on the undersurface and with deeply incised tips.

All the four species of *Pinanga* discussed above are excellent ornamental palms, especially at the juvenile stage (e.g., as pot plants) when the mottling of the leaves is most prominent. In *P. maculata*, *P. copelandii* and *P. bicolana* the first seedling leaves are generally much larger and with broader spots than in *P. curranii*. It is, however, in *P. maculata* where the variegation is most striking and in most cases continues until fruiting stage.

Seeds of *P. maculata* and *P. copelandii* may have been distributed through the Palm Society Seed Bank, but names provided should be treated with caution. Precise identification of the plants is only possible when they start to flower and bear fruits.

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