

Beccari to delimit sections of the genus, is known in other species to be unreliable. (Thus in *Pinanga latisecta* and *Pinanga variegata* var. *hallieriana*, flower arrangement may be spiral or distichous, and mixed inflorescences even occur.) The two Kinabalu taxa are also closely related to *P. capitata*. Unfortunately it has not been possible to ascertain whether there is one very variable species with a wide altitudinal range or two species, one on the lower slopes, one on the upper slopes; this requires field work on Kinabalu. However in using *P. capitata* for naming the ridge top plant from Mulu, I am certain there is no earlier name.

The inflorescence of the divaricate leafleted *Pinanga* from G. Mulu is also indistinguishable from that of *P. capitata*; I have examined very carefully details of flowers and fruit and they are identical, and similarly textural and indumentum features of the stem, sheath and lamina are the same. Yet the leaflet arrangement is strikingly different. That this leaflet difference is the only difference between the two plants suggests that the divaricate leafleted species should be regarded as a variety of *P. capitata*. A description follows.

***Pinanga capitata* Becc. ex Gibbs var. *divaricata* Dransfield var. nov.** a varietate typica foliolis valde divaricatis, iis paris apicalis manifeste oppositis, secus margines interiores non connatis differt. Typus: Borneo, Sarawak, *Dransfield* JD 5361 (holotypus K; isotypus SAR).

Clustering montane monoecious unarmed pinnate palm with stems rarely exceeding 2 m long. Stem to 2.5 cm diam. with internodes to 10 cm long, the stem surface densely covered with dark red-brown to blackish scales. Crownshaft only slightly swollen, to 70 cm long, 2.5 cm wide near the base. Leaf sheaths dull greenish-brown, densely covered with dark red-brown to blackish scales. Leaves about 6–8 in crown, to 1 m long in well-grown mature individuals, shorter in exposed individuals, occasionally up to 2 m long in rosette stages of juvenile; petiole to 40 × 0.5 cm, densely covered with silvery and dull reddish-brown scales; leaflets 7–12 on each side of the rachis, rather irregularly arranged and reflexed in the proximal part of the leaf, regular and opposite and divaricate in the distal part, with 1–2 folds; proximal leaflets longer than distal, 25–30 × 0.7–2 cm, the distal leaflets occasionally much smaller, the leaflets frequently constricted at the insertion on the rachis; bifid scales sometimes present on the main veins, on abaxial surface; abaxial surface of lamina also densely covered with minute scales and papillae. Inflorescence erect or pendulous, with spreading branches; peduncle to 2 cm long, 5 mm wide near the base; rachillae to 8 in number, 7.5 × 0.3 cm, somewhat flattened, glabrous, bearing distichously arranged flower groups up to 5 mm distant. Staminate flowers not known. Post anthesis pistillate flower with 3 imbricate, shortly apiculate, minutely ciliate, rounded sepals to 2 mm long; corolla with 3 petals similar to the sepals; ovary to 2 mm, oblong, tipped with an irregular, convoluted stigma. Rachillae turning reddish at fruit maturity. Mature fruit purplish-black, to 12 × 7 mm, tipped with the eroded stigmatic remains, with very thin pericarp with a poorly developed fibrous layer. Seed to 10 × 5 mm. Endosperm deeply ruminant. Embryo sub-basal. (Fig. 1).

SARAWAK. 4th Division, Kelabit Highlands, summit of Apo Duat, mossy forest, 1600 m *Paul Chai* S 35494 (BH, K, SAR). G. Mulu National Park,

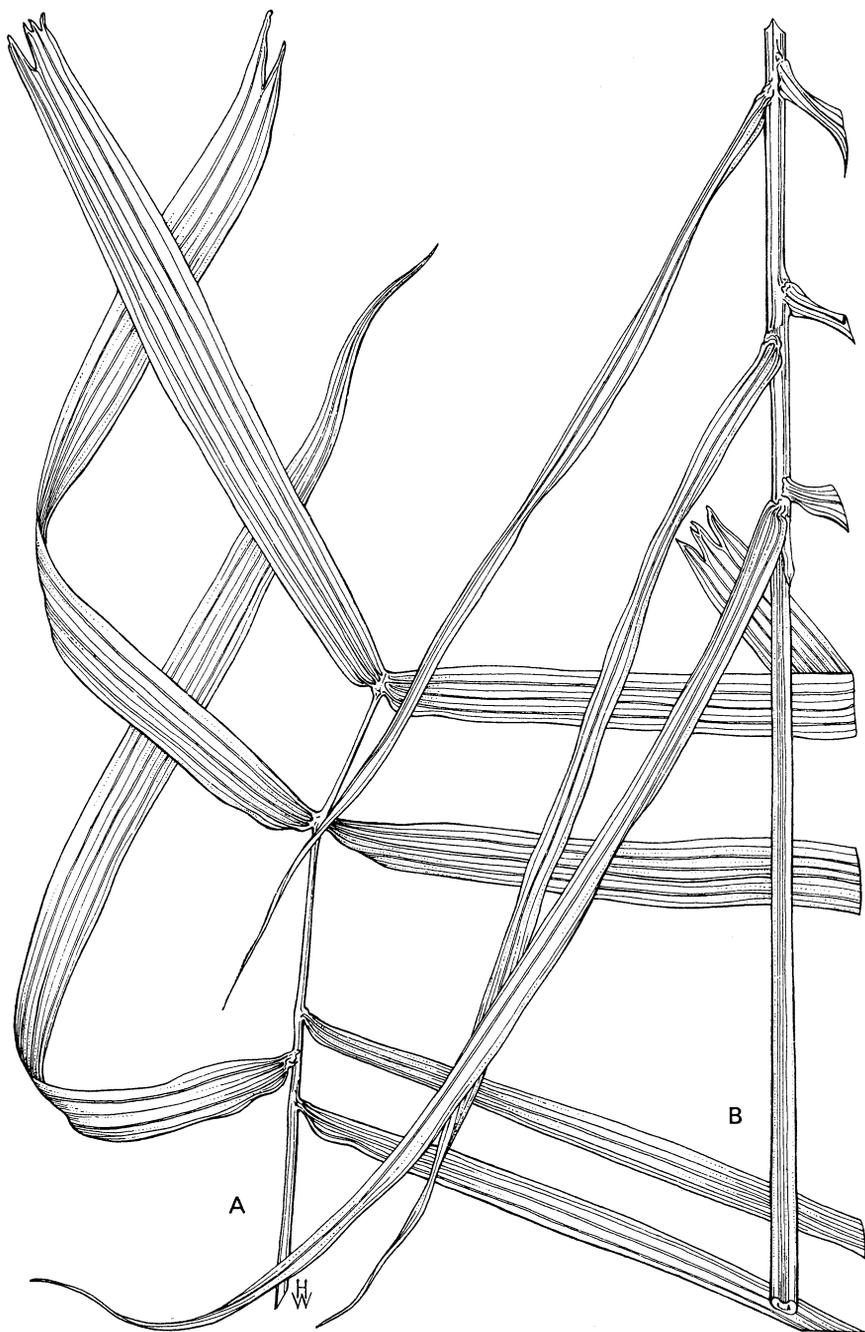


FIG. 1. *Pinanga capitata* var. *divaricata*. **A** leaf tip with divaricate leaflets  $\times \frac{1}{2}$ ; **B** petiole and lowermost reflexed leaflets  $\times \frac{1}{2}$ . All from *Dransfield* JD 5361. Drawn by Miss H. Wood.

upper montane forest on summit ridge, 1700 m, *Dransfield* JD 5361, (holotype K; isotype SAR).

BRUNEL. G. Pagon Priok, 1600 m, *Ashton* A 281 (K); A 257 (K).

**9. *Pinanga chaiana* *Dransfield* sp. nov.** species *Pinangae* compta vaginis foliorum lateritio-tomentosis, foliis furcatis non pinnatifidis, inflorescentiae rachillis 5–7 pendulis, triadibus florum distichis distinctissima. Structura inflorescentiae *P. patulae* similis, sed characteres vegetativi omnino diversi. Typus: Borneo, Sarawak, *Paul Chai* S 39601 (holotypus K; isotypi BH, L, KEP, SAN, SAR).

Solitary, unarmed, pleoanthic, monoecious undergrowth palm. Stem erect, unbranched, up to 5.5 m tall, about 2.5 cm diam., with internodes to 5 cm; nodes only slightly prominent; stem surface dull greenish-brown, densely covered with pale brown flocculent indumentum. Crownshaft elongate, about 40 cm long, only slightly wider than the stem, about 3.5 cm diam., dull green but densely covered with abundant flocculent pale buff to bright reddish-brown indumentum; ligule poorly developed; about 7 leaves in crown. Whole leaf including leaf sheath to 1.8 m long; leaf sheath to 30 cm long; petiole to 18 cm × 7 mm, triangular in cross-section; lamina entire except for a deep apical split, to 130 cm long, 38 cm wide at the widest point near the leaf tip, coarsely and shortly toothed at the apex, the toothed edge about 17 cm long, the lamina shallowly folded with about 32 main adaxial ribs, with a few less prominent parallel ribs between these; lamina when fresh pale dull green, slightly paler on lower surface than on upper, on drying becoming dull green on upper surface and russet brown on lower surface; brown indumentum very sparse, scattered along main veins on abaxial surface. Inflorescence infrafoliar, pendulous, to about 18 cm long; prophyll not known; all other parts turning black on drying; peduncle erect at base, then sharply reflexed, about 2 cm × 7 mm, with 5–7 crowded parallel branches; rachillae to 20 cm × 2 mm, glabrous; triads borne strictly distichously, about 4 mm apart; staminate flowers not known; pistillate flower globular, ± partly sunken into the rachilla; calyx of 3 free or basally shortly joined, rounded, cucullate, imbricate petals 1.2 mm diam.; ovary rounded, c. 1 mm diam., tipped with an irregular umbonate stigma. Mature fruit not known; almost mature fruit greenish-yellow, spindle-shaped, 10 × 6 mm, terminating in a moderately sharp point. Seed 8 × 4 mm; endosperm deeply ruminant. (Fig. 2).

SARAWAK. 4th Division, G. Mulu National Park, Ulu Sg. Berar, on ridge top in mixed Dipterocarp forest with heavy yellow clay soil, on Setap shale, c. 170 m, *Paul Chai* S 39601 (holotype K; isotypes BH, L, KEP, SAN, SAR).

BRUNEL. Andalau Forest Reserve, damp clay soil in valley, periodically inundated, *Ashton* A 501 (K).

This handsome 'pinang' is named after Paul Chai, the Forest Botanist, Kuching, who collected the type, and whose enthusiasm for palms has done much to enrich our knowledge of Bornean palms. I observed it sterile in a habitat similar to that of the type, at the foot of G. Buda, in the proposed extension of the G. Mulu National Park in October 1977.

This pinang is very distinctive in its russet brown crownshaft, undivided