



Pinanga schwanerensis, a new species of *Pinanga* (Arecaceae) from Kalimantan, Indonesia

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Abstract

A new species of palm, *Pinanga schwanerensis*, is described and illustrated here. This is the third species of *Pinanga* to have been described from Kalimantan since the description of *P. salicifolia* Blume and *P. albescens* Becc. A discussion of its morphological characters, distribution, ecology, habitat and conservation status is provided.

Keywords: Arecaceae, palms, *Pinanga*, Kalimantan, taxonomy

Introduction

The palm genus *Pinanga* Blume (1838: 65) is distributed from the Himalayas and South China to New Guinea, with the greatest diversity in the wet areas of the Sunda Shelf, while being poorly represented in Papuasia. There are approximately 131 species (Dransfield *et al.* 2008). The genus has radiated extensively in Borneo, where it is represented by 40 species (Govaerts *et al.* 2018) and displays great variation in size, form and ecology (Dransfield 1991). Many species are recorded from the northern part of the island, in Sarawak, Brunei Darussalam and Sabah, but there are fewer records from Kalimantan (Indonesian Borneo), despite the area being much larger and equally diverse in habitat.

As a result of extensive field trips to many locations and habitats in Kalimantan and also herbarium visits (BO, SAR, WAN), as part of the first author's MSc research, this new species of *Pinanga* has come to light. This new species is in fact one of four undescribed species found together with 27 well known species from 18 main locations throughout Kalimantan. Further study and nomenclatural clarification is still needed to confirm the taxonomic status of the other three undescribed taxa. All 31 taxa, including the three undescribed and several new records will be published separately in a forthcoming paper. This *Pinanga schwanerensis* A.Randi, Hikmat and Heatubun is the first new species of *Pinanga* to be described from Kalimantan for more than a century, since the description of *P. salicifolia* Blume (1843: 93) and *P. albescens* Becc. (1912: 89) from South Kalimantan.

Taxonomic Treatment

Pinanga schwanerensis A.Randi, Hikmat & Heatubun, *sp. nov.* Type:—BORNEO. Indonesia, Central Kalimantan Province. Katingan Regency, Sanaman Mantikei District, Tumbang Kaman Village, (1°14'35.50"S, 113°13'58.30"E, 150 m alt.), 16 February 2018, *A. Randi AR-650-KT* (holotype WAN!, isotype BO!, Herbarium Bandungense [FIPIA!]).

Diagnosis:—This taxon is similar to *Pinanga jambusana* C.K.Lim in general habit and inflorescence appearance, but can be distinguished by a combination of the following characters: the leaf pinnate or divided irregularly into 2–3 leaflets each side, rarely entire, with petiole to 120 cm long, ligule present; inflorescence interfoliar, bursting out among marcescent leaf sheaths; prophyll leathery and persistent; stamens 15–18; fruits broadly ellipsoid, colored dull white with dark purple at the tip and turning dark purple entirely when mature.

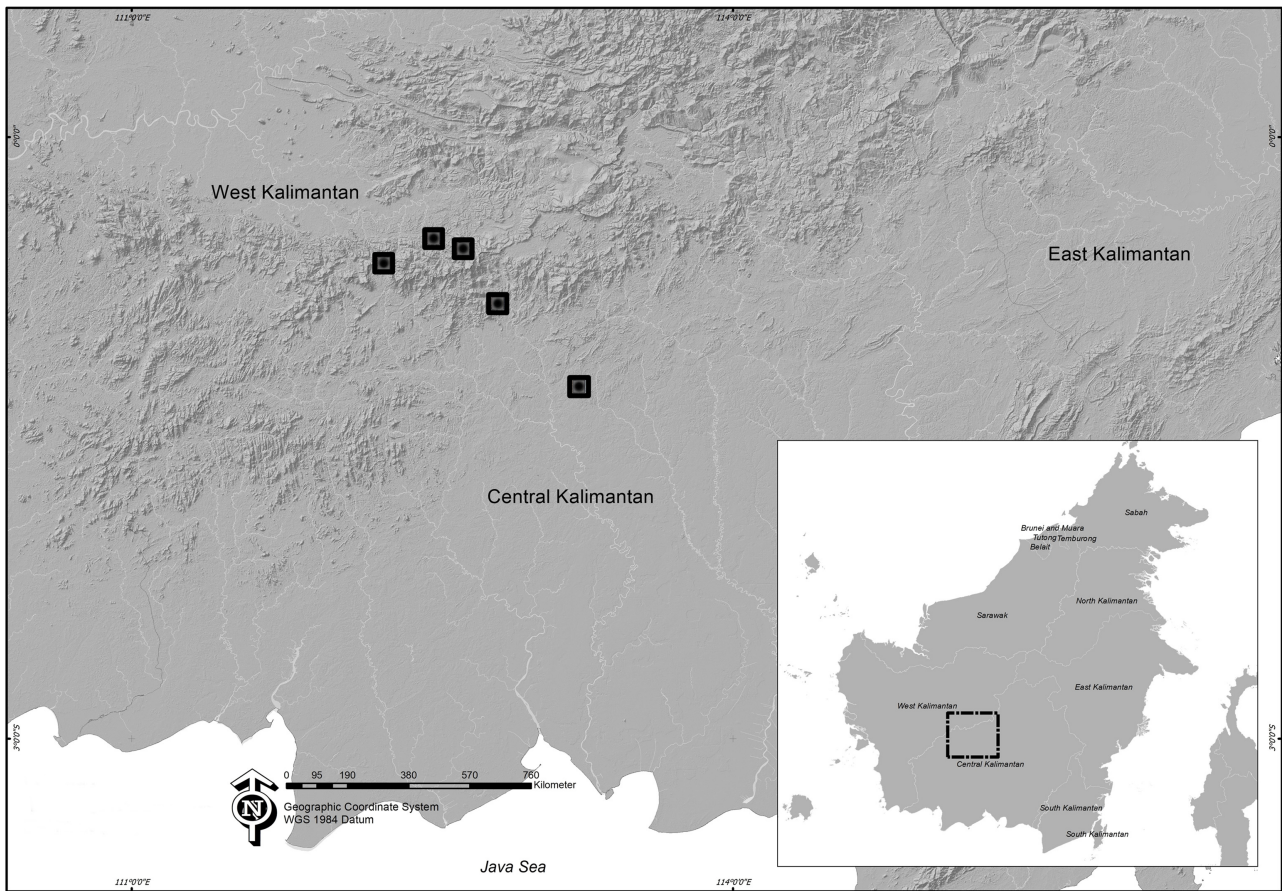


FIGURE 1. Distribution map of *Pinanga schwanerensis*.

Clustering palm with about 2–5 mature stems in a clump, small, acaulescent or with very short stem, rarely with erect stem to 1.3 m tall; stem to 60 cm long and 1–2.5 cm in diameter; internodes 1–3 cm; leaf scars conspicuous; stem green to yellowish when fresh, surface covered with dark red scales especially at the young part near the crown. Leaves 5–10 in the crown, erect, varying greatly in shape and size; crownshaft elongate but swollen at the base, 15–50 cm long, 2–5 cm wide, more or less twice wider than stem; leaf sheaths 8–15 cm long, 3–6 cm wide at the widest point, pale yellow at the base and turning to green near the petiole or bright yellow entirely, covered with dark red to purplish scales, ligule narrow triangular to 2.5 cm long; leaf pinnate, to 2.5 m long; petiole 6–120 cm long, 5–10 mm wide, pale green to yellowish with sparse indumentum, triangular in cross section; rachis very slender with adaxial longitudinal ridge, rounded abaxially; blade cuneiform, pinnate or irregularly divided into 2–3 broad leaflets on each side, occasionally divided only on one side, rarely entire but sometimes happened on young leaf, 50–120 cm long, 12–35 cm wide at the widest point near the tip, base oblique, margin toothed, leathery, discolorous, green and glabrous adaxially, abaxial surface covered by dense white scales when fresh, and becoming dull green adaxially and dull whitish abaxially when dry, slightly folded, 18–25 ribs prominent, abaxial ribs covered by brown indumentum. Inflorescence interfoliar, erect, bursting out from among marcescent leaf sheaths, pale to bright yellow when fresh, turning dull yellow to dark brown when dry, 7–15 cm long, 6–12 cm wide, protogynous, branching to 1 order; prophyll congested, 6–9 × 3–5 cm, leathery, strongly 2-keeled, enveloping half of inflorescence at the base, persistent (until fruiting stage), dark brown to blackish orange, covered in dense brown indumentum clearly visible when dry; peduncle 3–5 cm long, 4–10 mm wide, cream to yellowish orange; peduncle very short, cream to yellowish orange; rachis cream to yellowish orange; rachillae 4–6, 3–7 cm long, 2–5 mm wide, stout and straight, glabrescent, cream to yellowish orange, elongate. Floral cluster distichous on rachillae, complete triads including female flowers distribute along the length of rachilla. Staminate flower caducous, falling off soon after anthesis, white becoming pale brown before falling, small, about 9

mm in diam. at anthesis, asymmetric, pedicellate; pedicel very short less than 1 mm high; calyx with 3 triangular lobes about 1 mm high, united at the base, margins ciliate; corolla with 3 sigmoid or asymmetric triangular lobes, 7×3 mm, united at the base; stamens 15–18, small, cream; filament shorter than anther, very short about 0.5 mm long; anther 2.5×0.5 mm, elongate; pistillode absent. Pistillate flower globose, about 2.5 mm high, 3 mm in diam., sessile, basal free; calyx with 3 lobes, sepal about 2×2 mm, striate, rounded, margins ciliate; corolla with 3 lobes, petal wider than sepal about 2×2.5 mm, striate, margins ciliate, membranous; gynoecium about 2 mm high and 1.5 mm wide; stigma trifid, very short; staminode absent; ovary sub-globose. Fruits broadly ellipsoid, $1.4\text{--}2 \times 0.7\text{--}1.2$ cm, stigmatic remains apical; young fruit surface dull white with purple at the tip and turning to purple, bluish purple or dark purple entirely when mature; epicarp glabrous, thin; mesocarp about 2 mm thick, white, fleshy and juicy; endocarp fibrous. Seeds ovoid to ellipsoid, 8×4 mm, shiny brown, slightly hollowed at the bottom; endosperm with longitudinal rumination running from the tip to the base, usually with 2–3 grooves; embryo basal (rarely sub-basal). Seedlings with bifid eophyll. (Figure 2).

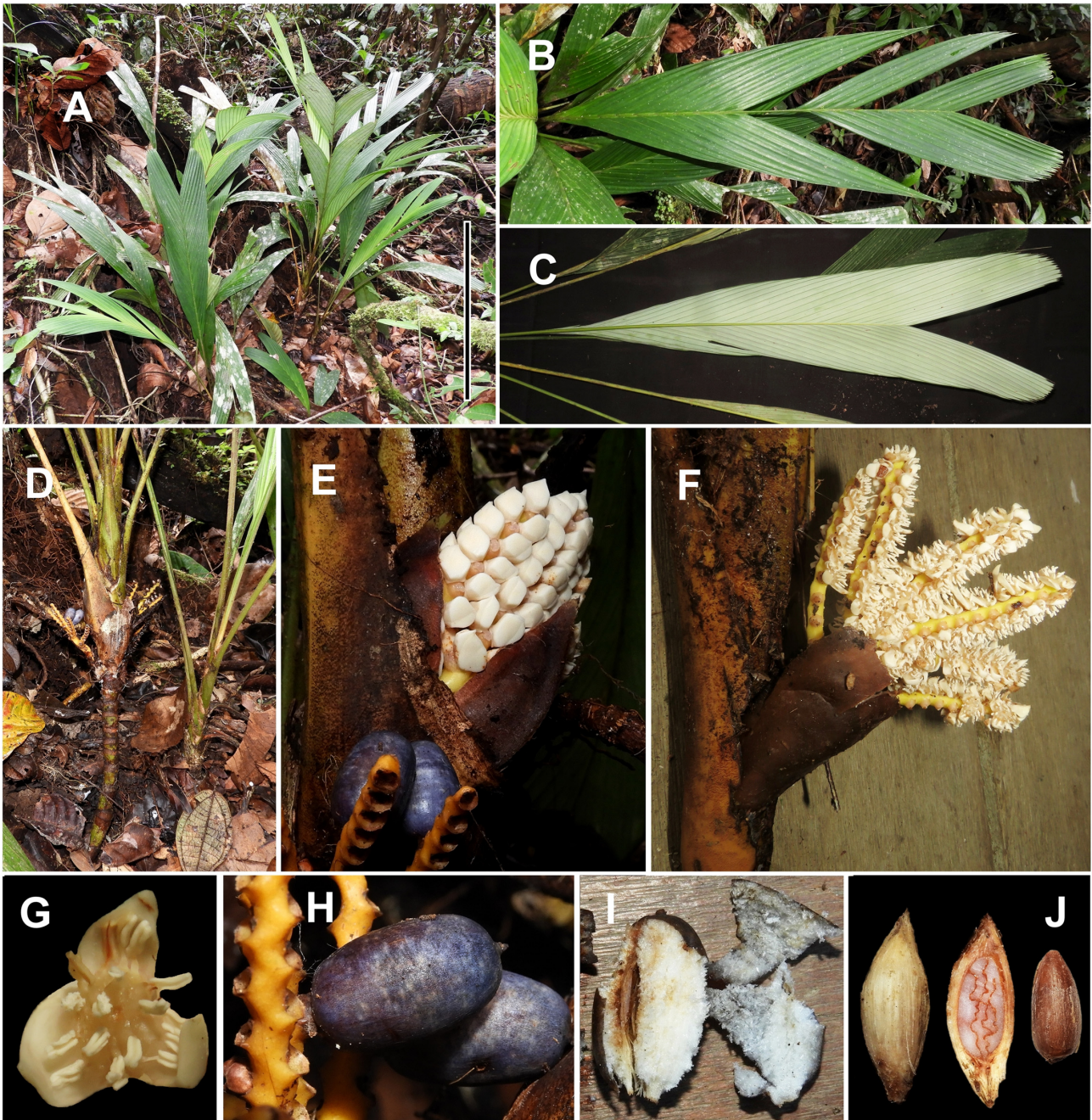


FIGURE 2. *Pinanga schwanerensis*. **A.** Clustering habit. **B.** Irregular divided leaf blade, upper surface. **C.** Undivided young leaf blade, below surface. **D.** Stem and crownshaft. **E-F.** Interfoliar inflorescence with persistent prophyll. **G.** Staminate flower. **H-I.** Mature fruit, epicarp and mesocarp. **J.** Endocarp and seed. Scale bar : A = 60 cm; B-C = 10 cm; D = 30 cm; E = 3 cm; F = 5 cm; G = 9 mm; H-J = 17 mm. All photos by A. Randi.

Distribution:—*Pinanga schwanerensis* is known only from the Schwaner mountains, which include the Bukit Baka Bukit Raya National Park at the border of West and Central Kalimantan of Indonesia. It has been recorded from five localities so far, two localities from West and three from the Central Kalimantan (Figure 1).

Habitat:—*Pinanga schwanerensis* grows in primary lowland Dipterocarp forest, on undulating land and slopes at an elevation of 150–550 m asl. It seems to prefer humid areas covered by dense forest canopy in narrow valleys and/or at the side of small rivers between ridges, usually growing on soil with a thick litter layer.

Vernacular name and uses:—No records.

Conservation status:—Endangered B1+2a,b(i,ii,iv). This new species of *Pinanga* meets the criteria for threat category “Endangered” (IUCN 2012) because it is known only from five localities in the wild and its area of occurrence (AOO) 16 km² and extended area of occurrence (EOO) 1,591 km² (GeoCAT, 2012). However, two localities occur within a National Park, but the other three are located within the logging concession.

Etymology:—From Schwaner Mountain in the border of West and Central Kalimantan, Indonesia.

Additional Specimens examined:—BORNEO. INDONESIA. **Central Kalimantan:** Katingan Regency, Tumbang Kaman, *A. Randi AR-650-KT* (WAN, BO, Bandungense (FIPIA)); Katingan Regency, PT. GSP logging concession, 300 m alt., 0°48'23.39"S, 112°49'55.59"E, February 2018, *A. Randi AR-625-KT* (BO); Katingan Regency, Upper Samba River, North-West of Tumbang Samba, 200 m alt., 0°50'S, 112°50'E, *Mogea 3705* (BO, L, K). **West Kalimantan:** Sintang Regency, Nanga Ella, 550 m alt., 0°33'40"S, 112°37'32.7"E, *Church et al.* 1911 (BO); Sintang Regency, Bukit Baka Bukit Raya National Park, Rantau Malam, 250 m alt., 0°33'26.54"S, 112°39'19.12"E, February 2018, *A. Randi KB-609* (BO).

Discussion:—*Pinanga schwanerensis* is very closely related to *P. jambusana* C.K.Lim (2005: 73). They both share some similarity in general appearance, such as acaulescent to short stems, the often entire discolorous leaf blade, the short and erect branched inflorescence. The coloration of the inflorescence, with yellow rachillae and bluish fruits is similar. However, the leaf blade of *P. schwanerensis* is polymorphic, but more often with pinnate or irregularly divided into 2–3 broad leaflets, rarely entire but sometimes in young leaves, whereas *P. jambusana* has entire leaf blade consistently. The inflorescence of *P. schwanerensis* is interfoliar, short and erect with congested rachillae, bursting out among marcescent leaf sheaths and the prophyll is leathery and persistent, while in *P. jambusana* the inflorescence is infrafoliar, also erect but spreading and the prophyll is rubbery and caducous. The fruits in *P. schwanerensis* develop from white to dark purple when mature, while *P. jambusana* have light blue fruits then turning to dark blue. Full comparison of characters between *P. schwanerensis* and *P. jambusana* is shown in the table 1 below.

TABEL 1. Comparison of characters between *P. schwanerensis* and *P. jambusana*.

Characters		<i>P. schwanerensis</i>	<i>P. jambusana</i>
Habit		Clustering	Solitary
Stilt root		Absent	Present
Ligule		Narrow triangular to 2.5 cm long	Absent
Leaf	Size	to 250 x 35 cm	to 150 x 20 cm
	Petiole	to 120 cm long	to 50 cm long
	Blade	Cuneiform, pinnate or divided to 3-broadly leaflets, rarely entire	Elongate, entire and bifid
Inflorescence	Position	Interfoliar	Infrafoliar
	Length	7–15 cm	to 25 cm
	Peduncle	3–5 cm	to 7.5 cm
	Prophyll	6–9 cm long, leathery, strongly 2-keeled, splits at the tip and envelopes half of inflorescence, persistent	6.5 cm long, rubbery in texture, broad ovate, splits at the tip to the base, caducous
Stamens	In number	15–18	22
Fruits	Shape	Broadly ellipsoid	Narrowly ellipsoid
	Size	2 x 1.2 cm	1 x 0.3 cm
	Colouration	White becoming dark purple	Light blue becoming dark blue
Habitat		Dipterocarp forest (in valley and slope)	Alluvial forest at the foot of limestone hill (near stream), riparian

The polymorphic leaf blade also suggests a relationship with *P. mirabilis* Becc. (1886: 126), but the inflorescences is very different. The inflorescence of *P. schwanerensis* is more slender, yellow, erect and bears ca. 6 rachilla, whereas the inflorescence of *P. mirabilis* is larger, purple, pendulous and normally comprises only a pair of rachilla. The persistent prophyll is reminiscent of *P. simplicifrons* (Miq.) Becc. (1886: 124) in which the inflorescence is enclosed entirely until the maturation of the fruits, but the prophyll of *P. schwanerensis* splits at the tip to expose the flowers, and envelopes only half of the inflorescence.

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