

Pinanga cleistantha, a New Species with Hidden Flowers

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ABSTRACT

Pinanga cleistantha from Malaya is described as new. Its unusual inflorescence entirely enclosed within the prophyll is discussed in relation to flowering patterns among other species of the genus, and to other genera with enclosed inflorescences.

Flowering in *Pinanga* almost always follows a precise pattern. The rachillae, enveloped by a single bract (prophyll), develop within the confines of the crownshaft, swelling and eventually imparting a "pregnant" appearance to the plant. When the oldest leaf abscises neatly, the inflorescence is released, usually becomes pendulous in a matter of hours, and the prophyll splits and falls off, exposing the flowers. Flower opening appears to be controlled by leaf fall; pistillate anthesis usually occurs immediately. It could be, of course, that swelling of the inflorescence initiates leaf abscission.

The interrelationships of leaf and inflorescence production throughout *Pinanga* would make a very interesting natural history study. In a few species the precise pattern of development noted above is modified. In some acaulescent species or species with tardily abscising leaves, the leaf sheath may rot on the stem, and the inflorescence is not released, but the prophyll splits, and anthesis takes place surrounded by the rotting sheath and, usually, by a great mess of leaf litter. An example of this type is Bornean *P. dumetosa* J. Dransf. An even

more remarkable pattern of development can be seen in *P. simplicifrons*, an undergrowth palmet of Malaya and Sumatra; here the leaves do not fall away neatly but rot on the stem and a crownshaft can scarcely be distinguished. The inflorescences, barely 3 cm long, burst out through the rotting leaf sheaths and become pendulous, but the prophyll does not split, the flowers opening while enclosed within the prophyll. Fruit are produced in abundance and burst through the prophyll; are they produced "cleistogamously" by transference of pollen from staminate to pistillate flowers within the prophyll, or are small insects such as nitidulid beetles finding a way into the inflorescence and effecting pollination? The prophyll does split sometimes at its very base, and this would allow access to the flowers, but the truth is that the flowering process in this palmet has never been followed in detail.

Recently I discovered an undescribed species of *Pinanga* with an inflorescence similar to that of *P. simplicifrons*, growing in superbly palm-rich lowland forest in Trengganu, West Malaysia. In the new species there is a well-developed crownshaft, but, although the inflorescences are released and become pendulous in the normal way, the prophylls remain entire. Occasionally the prophyll opens minutely at its insertion allowing access to the flowers but on many inflo-

rescences with developing fruit, there is no sign of a split in the prophyll and pollination must have taken place between flowers of the same inflorescence, or some sort of apomixis has occurred. This is such a remarkable species and has such extraordinary flowers that it deserves closer attention.

Pinanga cleistantha J. Dransf. *sp. nov.* singularis floribus intra prophyllum occultis, structura florum pistillatorum et fructuum *P. simplicifrondi* affinis sed omnibus partibus multo majoribus, columna coronae distincte evoluta, folio amplo maculato inferne pallidiore, prophylo lanceolato vice ovato, axe inflorescentiae spicata dense tomentosa vice bifida glabra, flore staminato basin pseudo-pedicellum longum ferenti differt.

Typus. MALAY PENINSULA, TRENGGANU, Ulu Setiu Forest Reserve, *Dransfield* JD 5179 (holotypus K; isotypi BH, KEP).

Clustering undergrowth palm spreading by runners; stem to 1.5 m tall, 10 mm diam., dull brown below, greenish above, bearing scattered brown scales; internodes to 5 cm; nodal scars ca. 2 mm high, paler than internode surface. Crownshaft well developed, to ca. 30 × 1.7 cm, bright green, with 7–8 leaves in the crown. Leaf sheath strictly tubular to 23 × 1.7 cm, bearing scattered brown scales, the mouth with a tattered margin; petiole to 50 × 5 mm densely grey-brown tomentose; lamina unsplit except for a deep apical cleft to 25 cm, or split to produce 2–3 broad leaflets of uneven width on each side of the grey-brown tomentose rachis; lamina where unsplit to 55 × 25 cm, the apical margins with coarse teeth to 1 cm corresponding to the major ribs; lamina where split with leaflets 25–35 × 3–9 cm, the distal pair with apical toothing, the proximal long acuminate; adaxial lam-

ina surface ± glabrous mid-green, mottled with dark green; abaxial surface slightly paler when fresh, not mottled, with scattered grey brown indument along the main ribs. Inflorescence infrafoliar, pendulous spicate; peduncle tomentose, flattened, to 10 × 6 × 2 mm, the margins undulate, the base with crescentic wings encircling the stem; prophyll enclosing the rachilla, lanceolate 13–19 × 2–4.5 cm, acuminate in a compressed tip to 10 × 3 mm, pale cream-colored when newly exposed, drying cinnamon brown; rachilla 7–9 cm long, ca. 3 mm wide at the base, tapering distally, densely covered with pale-brown tomentum; triads about 6–7 in all, ± distichously arranged 3–4 on each side of the rachilla, each subtended by a triangular bract to 4 × 4 mm. Staminate flowers unequal and asymmetric, pseudopedicellate, one flower with a highly developed pseudopedicel to 13 mm long, the other with pseudopedicel to 3 mm only, the pseudopedicel ± glabrous, compressed ca. 0.4 mm at the base increasing to 3 mm wide at the base of calyx lobes; calyx lobes explanate, keeled, triangular 1–3 × 1–2 mm, two larger than the third; corolla glabrous with 3 uneven, contorted triangular petals, 2 broad triangular to 9 × 4 mm, the third to 9 × 2 mm; stamens 10–12; filaments ca. 1 × 0.1 mm, united at the very base; anthers 4 × 0.2 mm. Pistillate flower with 3 free imbricate, ciliate-margined striate sepals to 5 × 4 mm, and 3 free imbricate ciliate-margined petals to 5.5 × 3 mm; ovary to 5 × 2 mm, tipped with a short style to 0.8 mm, and a conspicuous pectinate-capitate stigma to 2.5 mm diam. Fruit narrowly ovoid to fusiform, usually slightly curved, to 25 × 5 mm, epicarp in young state brownish green. Seed to 20 × 4 mm; endosperm with shallow ruminations; embryo basal. Seedling leaf unknown.



Pinanga cleistantha. a, leaf apex $\times 1$; b, tip of stem and crownshaft $\times 1$; c, portion of stem with pendulous inflorescence $\times 1$; d, inflorescence with one face of the prophyll removed to show the unbranched axis and triads $\times 2$; e, staminate flower dissected, showing the unequal sepals and petals and long pseudopedicel $\times 4$; f, pistillate flower $\times 4$; g, almost mature fruit $\times 2$. (Drawn from Dransfield JD 5179 by Mary Millar Watt.)

Habitat. This elegant colonial palm was collected in lowland Dipterocarp forest in a valley bottom at 50 m altitude; growing with it were *Salacca multiflora* Mogeia, *Calamus minutus* J. Dransf., *Arenga hookeriana* (Becc.) T. C. Whitmore, *A. hastata* (Becc.) T. C. Whitmore and several widespread rattan species. Notes: It differs from all other *Pinanga* spp. except for *P. simplicifrons* in the enclosed inflorescence; from *P. simplicifrons* it may be distinguished by the much greater size of all its parts, by the broad leaf with mottled upper surface and paler lower surface, by the lanceolate rather than the ovate prophyll, the tomentose unbranched rather than glabrous bifid inflorescence axis, and by the staminate flowers with extraordinary pseudopedicels. Like many species of *Pinanga*, *P. cleistantha* would make an elegant horticultural subject, but no fruit was perfectly ripe when I collected it in 1977, and as far as I am aware it has not been collected since. Furthermore, the area where it grew was in the process of being logged, so its survival in the only known locality must

be severely threatened. Yet it must surely grow elsewhere in the Trengganu hills.

The specific epithet refers to the hidden flowers. Without further fieldwork I can only speculate on the significance of the enclosed inflorescence. Enclosed inflorescences are a feature of the rattan genus *Ceratalobus*, where the prophyll opens by a minute apical split and potential pollinators have to pass through this restricted passage to reach the flowers. In *Manicaria* the entire inflorescence is enclosed in a net-like bract; through the very small interstices of the bracts pass nitidulid beetles which seem to be the pollinators (Moore & Dransfield pers. obs. in Colombia, 1976). In these two genera the inflorescences are protected and the bracts act as pollinator sieves restricting access to the flowers to small beetles. If the prophylls of *Pinanga simplicifrons* and *P. cleistantha* open at the base then they probably function in a way similar to the prophyll in *Ceratalobus* and the bract in *Manicaria*, but there is evidence that the bract may never open.

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