SOME NEW AND CRITICAL PANDANUS SPECIES OF SUBGENUS ACROSTIGMA

I*. Supplement to Revisio Pandanacearum

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Abstract

Eight species of Pandanus subgen. Acrostigma are discussed in this supplement. Seven of them are additions: four have recently been published, two more are proposed as new herein and one has been omitted. P. ellipsoideus was poorly known and is here given a fuller description based on a recent collection. Both new species pertain to sect. Acrostigma subsect. Dimissistyli; one (P. gladiator) is from Sulawesi, the other (P. jacobsii) is from Papua New Guinea. As is usually the case, most of these species are as yet not represented by staminate specimens (known only in P. merrillii). Only one, P. microglottis, presents features which suggest a possible addition to the infrageneric scheme, but in the absence of sufficient specimens no change is suggested for the present.

Introduction

A synopsis, based on a critical revision, of two of the eight subgenera of Pandanus, subgen. Acrostigma and subgen. Coronata, was issued recently (Stone, 1978). That study, forming a component of the preliminary work leading to the revision of the family and to a family treatment in the Flora Malesiana, recognized three species in subgen. Coronata and 66 species in subgen. Acrostigma. Since then, a few additional species have been recognized, either as new or newly understood taxa from among the synonyms or nomina dubia. In this paper, these additions are listed in the same order of sections, subsections, and taxonomic order as was followed in the publication cited.

PANDANUS subgen. ACROSTIGMA (Kurz) Stone Sect. ACROSTIGMA Kurz

SUBSECT. ACROSTIGMA


SULAWESI: Sopu valley, west slope, Roroka Timbu, ridge forest at 1200 m. alt., clay soil; short-stemmed stooling herb, inflorescence erect, fruit green, leaves used for making mats (tikar), 4 May 1979, M. J. van Balgooy 3147 (L).

Extended description: short-stemmed, stooling herb. Leaves linear, c. 120 cm long

* This paper is dedicated to the late Marius Jacobs of the Rijksherbarium, Leiden, in memory of his contributions to Malesian botany and his ungrudging help and assistance.
Below left: Fig. 1. *Pandanus ellipsoideus* Warb. — *A*: cephalium, 1 s.; *B & C*: drupe, *B*: profile and *C*: 1 s., note the chamber above the endocarp in *C*; *D*: leaf apex, adaxial surface. All from Balgooy 3147 (L).

Above left: Fig. 2. *Pandanus merrillii* Martelli — Cephalium (upper) ± x 1; and drupes (lower) ± x 1; from the type collection, Merrill 840 (F1). (Courtesy of Dr. C. Steinberg).

Right: Fig. 3. *Pandanus merrillii* — Infructescence with cephalia, ± x 2/3; from Bermejos BS 232 (F1). (Courtesy of Dr. C. Steinberg).
(or more), 3.8 cm wide, the apex gradually acuminate; lower surface glaucous; upper surface finely striolate, indistinctly cross-nerved toward apex; lower surface with fine, close longitudinal nerves (c. 84–86 per leaf), very slightly indistinctly raised, intervein areas densely stomatophorous. Leaf margins near base with spreading slender prickles c. 2 mm long, usually 3–5 mm apart; near middle, the prickles shorter, more appressed, c. 1 mm long, 3–6 mm apart; near apex, the prickles still smaller, c. 0.5 mm long, 1–2 mm apart. Beneath, midrib near base with short erect or retrorse prickles at least 1 mm long (or reduced and nut-like on scale leaves and lower bracts), often 3–4 mm apart but rather irregularly spaced; near middle, the midrib carinate, with antrorse prickles c. 1 mm long, 4–10 mm apart; near apex, with prickles similar in size and spacing to those on adjacent margins. Apical ventral pleats prickly along distal 30–33 cm with numerous small antrorse prickles c. 0.5–0.7 mm long, nearer the apex mostly 1.5–4 mm apart. Inflorescence erect, the pistillate peduncle to 50 cm long, 8 mm wide, triquetrous, glabrous, bracteate, distally zig-zag-helical, bearing 5 to 7 smallish ellipsoid cephalia c. 6 cm long, 5 cm wide, composed of numerous drupes, these with projecting, sharp, straight or slightly curved styles. Drupes 15–20 mm long (including style), c. 5 mm wide, the corpus clavoid, mostly 11–13 mm long, the pileus 5–6-angled, steeply pyramidal, gradually and rather indistinguishably produced upward as the sharp spiniform style, this erect or only slightly antrorsely curved, sharp, to 9 mm long; stigma linear, grooved, papilllose, almost reaching the style tip. Apical mesocarp chamber large, rounded, c. 4 mm long; lower mesocarp very short fibrous; endocarp pale, c. 6 mm long, apex concave, base tapered, walls c. 0.5–0.6 mm thick.

In its inflorescences, leaves, and fruits, this species very much resembles *P. affinis* Kurz, a freshwater swamp lowland species common in Western Malesia, but in habit (as noted above) and certainly in habitat, this species appears quite different. The drupes of the cited specimens are an excellent match for those illustrated by Martelli.


A slender upland swamp species of Papua New Guinea, belonging to the group of species including *P. adinobotrys* Merr. & Perry.


A shrub similar to *P. adinobotrys* but more slender and smaller in all respects except the longer pistillate peduncles.


This recently described Papuan species is an addition to the small cluster of species centering around *P. adinobotrys* Merr. & Perry.

PAPUA NEW GUINEA: West Sepik Distr., Telefomin, alt. 1800 m, wet swamp,
erect pandan to 3 m tall, with many short side branches, leaves grey, fruit pale


PHILIPPINES: Palawan; Paragua Island, San Antonio Bay, alt. 1500 ft., on dry

Additional collections, all from Palawan; Merrill 7250, 9274 (staminate), 9375, and Bermejos B.S. 232 (Fl).

This species is so similar to *P. affinis* Kurz that, on the basis of herbarium
material alone, discrimination is virtually impossible. The sole difference worthy of
note seems to be the presence, albeit slight, of minute bristles on the pistillate
peduncle, noticeable in the type collection. The slightly hispidulous peduncle is not,
so far, known in *P. affinis*, but is found in *P. monticola* F.v.M. of Queensland,
another (but quite different) species of sect. *Acrostigma*. Following are some
supplementary descriptive notes on *P. merrilli* drawn from the isotypes.

Leaves linear attenuate acute, the apex somewhat prolonged, subflagellate, to
162 cm long (and over), 2.8 cm wide; base with sheath about 3.5 cm long; margins
near base with spreading prickles with slightly recurved tips 2–2.8 mm long,
1.5–5 mm apart; near the middle, the marginal teeth slender antorse, nearly 1 mm
long, 3–6 mm apart; near apex, the teeth antorse, 0.25 mm long, 1 mm apart.
Midrib near base with stout broad-based retrorse prickles to nearly 3 mm long,
1.5–11 mm apart; farther out along basal fifth of leaf, the prickles recurved,
2 mm long, more remote, to 25 mm apart; near the middle, the teeth scarcely 1 mm
long, antorse, 10 mm apart; near apex, the teeth similar in size and spacing to those
of the adjacent margin. Apical ventral pleats prickly with antorse prickles scarcely
0.5–0.9 mm long, irregularly spaced, sometimes only 1 mm apart, sometimes several
cm apart, extending along the most distal 30 cm of the leaf. Undersurface pale
glaucous. Longitudinal nerves about 67–69 per leaf, dorsally overlain by the minute
punctiform stomatal complexes visible as 3–5 parallel rows of dots. Infructescence
spicate, cephalia 5 (or more?) together, each c. 5.5 cm diameter, the drupes crowded.
Penduncle slightly hispidulous toward apex, or not (?). Drupes c. 27 mm long
(including styles), the corpus 15 mm long, 4–5 mm wide; pileus 3–4 mm long,
produced into a style c. 6 mm long. Staminate inflorescence spicate; spike bearing
apparently solitary stamens, each with a short filament 1 mm long and a long
anther 8 mm long, the apiculus 0.5 mm long. (Staminate description based on
Merrill 9274).


This Sarawak species is noteworthy for its polycephalic infructescence and the
short, ovate-acute stigmas on similarly short, broad, non-spiniform styles. The latter feature suggests that the species has an isolated position in the section and may even deserve a subsectional rank on its own. However, pending the discovery of the staminate plants, this remains a potential status rather than a clearly deserved one, and for the time being, it is merely ranked as a species of subsection *Acrostigma*.

**SARAWAK:** Mulu National Park (4th Division), Sungei Melinau Paku drainage area along rocky riverbanks beside Transit Camp 2 at c. 150 m alt., 2 Apr. 1978, *Stone* 13654 (holotype, KLU; isotypes, K, SAR).

**SUBSECT. Dimissistyli** Stone

*Pandanus gladiator* B. C. Stone, *sp. nov.*

Fig. 4.

Frutex arborescens usque ad 5 m altus, erectus, sparsiter ramosus, strictus; solitarius; corona foliorum densa; *folis* lineari-attenuatis coriaceis munitis, usque ad 300 cm longis, et 8 cm latiss, apice acutissim breviter subcaudatis; marginibus in basi dentatis, dentibus rigidis deltoideis patentibus c. 2.5 mm longis et 2–5 mm sese separatis; in medio, dentibus subappressis curvatis antorssis c. 2 mm longis, (3–) 5–9 (–12) mm sese separatis; apicem versus, denticulis parvissim breviter subcaudatis; in medio, denticulis parvioribus, subappressis antorssis curvatis, klydoniformibus, densis, c. 1–1.4 mm longis et 1 mm sese separatis; *costa media* dorso in basi hamato-aculeato dentibus reflexis 3–3.5 mm longis, 3–12 mm sese separatis; in medio, denticulis subappressis antorssis parvioribus c. 1.4–1.8 mm longis, (2–) 4–8 (–11) mm sese separatis; apicem versus, denticulis antorssis gracilibus c. 1–1.2 mm longis et 2–3 mm sese separatis; in cauda, denticulis ad eis in margine adjacenti similibus; pagina infra ut videtur pallido et glauco, densiter et obscuriter venosostriatulo; plicibus apicalibus foliorum ventraliter denticulatis. *Inflorescentia* axillaris, spicata, robusta, bracteata (bracteis delapsis), polycephala (cephalii c. 5–7); cephalii aggregati, oblatō-rotundis, laterali subcompressis, c. 9–10.5 cm longis, 10–11 cm latiss, recepactulo c. 3–4 × 2.5 cm, drupis numerosis ferenti; pedunculo triquetro c. 40 cm longo, 2.5 cm crasso, robusto. *Drupa* (ex loco mediani) c. 40 mm longa; pileo (corpo styloforme) 25–30 mm longo (stilo inclusu); pyrena basali anguste obovoidea 8.9–9.5 mm longa et 3 mm lata, vel (mesocarpio basali inclusu) c. 11 mm longa; stylo (sensu stricto) spiniforme, antorss curvato vel recto, 4–6 mm longo, acutissimo; stigmate anguste canaliculati nigro, per totam longitudinalinem styli; endocarpio pallido pariete c. 0.5 mm crasso. Cetera ignota.

*Type:* SULAWESI (Celebes), Mt. Roroka Timbu, west slope, c. 80 km SSE. of Palu, disturbed lower montane forest c. 35 m high, with little undergrowth, on steep terrain with shallow clayey soil; solitary "schopfbaum" 5 m tall, fruit bright red; leaf c. 3 m long; trunk hardly branched; 11 May 1979; *E. F. de Vogel* 5287 holotype, BO!; isotypes, L! KLU!).

This species fits readily into subsection *Dimissistyli*, but is the first species in that group to present a spicate, polycephalic infructescence, and this seems its principal distinctive character. However, drupe size is smaller than in *P. danckelmannianus* K. Schum. and larger than in *P. misimaensis* St. John ex Stone; but about the same as in *P. erinaceus* Stone and *P. lictor* Stone. The long pilei of the drupe are relatively smooth, unlike the coarsely verruculose pilei of *P. verruculosus* Backer ex Stone.

The species is known so far only from the type collection.

The specific epithet is well known and means "sword-fighter" in allusion to the sword-like leaves; but also more broadly appropriate because of the various weapons which the Roman gladiators used, including the mace, to which the fruit-heads bear
a certain resemblance. The species is also a companion of *P. lictor*, the specific epithet of which means "mace-bearer."

*Pandanus gladiator* is the western-most of subsect. *Dimissistyli*, and probably indicates the absolute western boundary of this subsection. There is one other Moluccan species (*P. verruculosus*), from Halmahera, but probably a few more remain to be found. Most of the species are in New Guinea, the Bismarck Archipelago, and the Solomon Islands.

**Pandanus jacobsii** B. C. Stone, sp. nov. Fig 5.

Frutex usque ad 2-3 m altus, stipite ad 4 cm crasso, simplex; radicibus gralliformibus nullis. Folia linearia ad 220 cm longa, 5 cm lata, infra glauca, apicem versus acutam; marginibus in basi dentatis, dentibus c. 2 mm longis, 1-5 mm sese separatis; in medio, dentibus antrorsis, c. 1 mm longis, 1-5-4 mm sese separatis; apicem versus, denticulis subappressiter antrorsis c. 0.5-1 mm longis, c. 1.5 mm sese separatis. Costa media dorso in basi per spatia 15-18 cm inerme, deinde dentibus deltoideis patento-retrorsis ad 2.5 mm longis, 6-14 mm sese separatis; in medio, costa carinato, denticulis antrorsis 0.7-0.9 mm longis, 1-3 mm sese separatis; apicem versus, denticulis antrorsis 0.5-0.9 mm longis, 1-3 mm sese separatis. Plicae foliorum apicali-ventraliter armatae, denticulis antrorsis 0.75 mm longis, irregulariter separatis, sparsi. Inflorescentia axillaris, pedunculo c. 10 cm longo, 14 mm crasso (apicem versus); cephalio solitario oblasto-globoso c. 10 × 11 cm, receptaculo c. 4 cm longo, drupis numerosis composito. Drupa c. 35 mm longa, pileo c. 20 × 4 mm angulo, verruculosos-tuberclato, in stylo 6-7 mm longo antrorse curvato prodotto, stigmata lineare subaequilo; pyreno 12-13 mm longo, 4-5 mm lato, endocarpio 10 mm longo, pariete pallido c. 0.14 mm crasso. Semen c. 8 mm longum. Cetera ignota.

Type: PAPUA NEW GUINEA: Southern Highlands Prov., limestone country near Waro airstrip 20 km SSW of Kutubu, 6° 31'S, 143° 10'E, at 500-600 m alt., single-stemmed pandan without proproots, 2-3 m tall, leaves glaucous underneath, fruit light red, 15 Oct. 1973, M. Jacobs 9281 (L holotype, 2 sheets!).

Like most species of subsect. *Dimissistyli*, *P. jacobsii* has the erect, not or little-branched trunk, with no or few basal proproots, an axillary inflorescence, the pedillate peduncle bearing a solitary oblate globose cephalium, and the drupes ripening red. In *P. jacobsii*, the drupes are quite small, approaching *P. misimaensis* St. John ex Stone, in their dimensions. However, the additional length and the more coarsely verruculose-tuberclate pilei distinguish *P. jacobsii*. The marginal prickles of the leaf apex are moreover smaller in *P. misimaensis*. *Pandanus verruculosus* Backer ex Stone has also the tuberculate pilei intimated by its name, but in this Halmaherian species the cephalia are larger (12-15 cm diameter) and leaves much larger (to 500 × 14 cm). Perhaps the most similar species to *P. jacobsii* is *P. erinaceus* Stone, which however is a taller plant (to 5 m), with basal proproots to 1 m long, and the drupes have a virtually smooth pileus.

The new species is named after the late Dr. M. Jacobs of the Rijksherbarium, Leiden, in recognition not only of his merit in obtaining the type collection but for his botanical contributions to the Flora Malesiana and special assistance to the author.
Right: Fig. 5. *Pandanus jacobsonii* B. C. Stone sp. nov. — A: drupe, profile and B: pyrene, l.s.; from the type collection *Jacobs 9281* (L).

Left: Fig. 4. *Pandanus gladiator* B. C. Stone sp. nov. — A: leaf apex, adaxial surface; B: idem, detail of marginal prickles; C: leaf, middle portion, abaxial surface; D: leaf base, abaxial surface; E: cephalium, l.s.; F: drupe, profile; G: pyrene, profile and l.s.; H: detail of style & stigma and I: infructescence. All from the type collection, *de Vogel 5287* (L).
SUBSECT. *Alticolae* Stone


A remarkable, small, sprawling decumbent plant, probably a facultative epiphyte, known so far only from the massive limestone peak Gunung Api in Mulu National Park, Sarawak. The solitary cephalium is only 15 mm long (sometimes two occur together), but the size of the fruit at maturity is not known. At the unripe stage the drupes are only about 1 cm long.


It should be mentioned that the type species of this subsection, *P. alticola* Holtt. & St. John, is also known from Sarawak and has in fact also been collected in Mulu National Park (*Ivan Nielsen 662*, in AAU).

**Acknowledgement**

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**Literature Cited**