A REVIEW OF THE AUSTRALIAN SPECIES OF *PANDANUS*, SECTIO *SEMIKEURA* (PANDANACEAE)

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Abstract

The closely related and at least partly synonymous species *Pandanus aquaticus*, *P. delestangii*, *P. kimberleyanus*, *P. spechtii*, and *P. oblanceoloideus* are grouped together in a newly established section of *Pandanus* subgenus *Pandanus*, named sectio *Semikeura*. *P. delestangii* is selected as type species. The species *P. basedowii* is considered sufficiently closely related to be included in the section, but distinct enough to be accommodated in a new monotypic subsection called subsectio *Elaphrocarpus*. Morphological and leaf-anatomical criteria are relied upon for taking these steps; all species mentioned had formerly been assigned to sectio *Microstigma*, from which sectio *Semikeura* is shown to differ in several fundamental ways. A discussion of the nomenclatural status of *P. aquaticus* is also given.

INTRODUCTION

Along many of the larger permanent rivers in the northern part of Australia, from Western Australia through the Northern Territory to north Queensland, there are riverine forests which include pandans. Characteristic of these habitats is a group of species of which *Pandanus aquaticus* F. Muell. was the first to be named. All told, five species have been distinguished: Mueller's, which was given the status of "species incertae sedis" by Warburg (1900); *P. delestangii*, described by U. Martelli in section *Hombronia*, and three more proposed by H. St. John in recent years. Our knowledge of most of these is rather fragmentary, so much so that it is really very doubtful whether all of the them can be maintained as distinct entities. As pointed out below, there seems at present a greater likelihood that only one, or possibly two, species are present in nature, but infraspecific taxa may have to be recognized. Comparisons of living plants in their natural habitats are the best means of testing this hypothesis. At whatever rank, these taxa form a very natural and homogeneous group which is unlike any other in the genus *Pandanus*. They have all been assigned by St. John (1969) to sectio *Microstigma*, which is typified by *P. conoideus* Lamk. of Amboina and New Guinea, but extended comparison shows that this position is untenable and neither *P. conoideus* nor any of its consectional related species are sufficiently like the "*aquaticus*" group to warrant inclusion in the same section nor, for that matter, in the same subgenus. Sectio *Microstigma* pertains to subgenus *Kurzia*, while sectio *Semikeura*, as the "*aquaticus*" group of species is now named, belongs in subgenus *Pandanus*. Thus, the two sections differ in several very fundamental features, and these are mentioned in Table 1.

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TABLE 1

CONTRASTS BETWEEN SECTIO *SEMIKEURA* AND SECTIO *MICROSTIGMA*

Sectio *Semikeura*	Character	Sectio *Microstigma*
Drupes simple or adnate in paucilocular phalanges	Drupes	Drupes always simple
Fleshy or thin, not oily	Pericarp	Oily red or yellow
Pithy medullose	Upper mesocarp	Chambered, fibrous
In bilocular phalanges, stigmas face each other	Stigmas	All stigmas face apex of cephalium
Ovoid-subglobular	Cephalium	Elongated, cylindric, or narrowly ellipsoid
Adaxial ventral pleats unarmed	Leaf apex	Adaxial ventral pleats denticulate
Racemose on a distinct column (stemonophore)	Stamens	Adnate by filaments into ± tubular but complanate array

Pandanus basedowii C. H. Wright, originally described in sectio *Acrostigma* and transferred to sectio *Microstigma* by St. John (1962), is also included here in sectio *Semikeura*, although it differs sufficiently to warrant the creation of a monotypic subsection, herein named subsectio *Elaphrocarpus*, to accommodate it. It has a distinctive fruit morphology and is also a member of a different kind of plant association in a different habitat.

Sect. **Semikeura** B. C. Stone, sect. nov.

Sectio Pandani similis, foliis leviter minoribus angustioribusque, carpidiis libris vel in phalangibus pauciloculatis (2-3-natis), et phalangibus staminorum paucistaminatis filamentis 4-7 racemose usque ad apicem columni dispersis differt.

Type Species.—*Pandanus delestangii* Martelli (Queensland).

The name is based on Forsskal's generic name *Keura* and refers to the phalanges which have fewer component carpels than *Keura*, i.e. sectio *Pandanus*. *P. delestangii* is selected as the type because (*a*) both pistillate and staminate plants have been collected, and (*b*) there is no doubt about the application of the name since the type specimen of the species is a pistillate collection. To no other species except *P. kimberleyanus* (which has a rather scanty, imperfect holotype) can we successfully apply both of these criteria: there is a nomenclatural controversy about *P. aquaticus*, which in addition is based upon a staminate type specimen, while of the other species we know as yet only pistillate collections.

1. Subsect. **Semikeura**

1. **Pandanus aquaticus** F. Muell. in Hook., J. Bot. Kew Gard. Misc. 8: 329. 1856 (nomen provisorium); Fragm. Phyt. Aust. 5: 40. 1865; ibid. 8: 220. 1874; Solms in Linnaea 42: 69. 1878; Warburg in Pflanzenr. 3 (= IV. 9): 85. 1900 (species incertae sedis); Blake in Aust. J. Bot. 2: 130, pl. 7 f. 3. 1954. *Type.*—*F. Mueller* (MEL holo; K staminate inflorescence), xii. 1855, Upper Victoria River, Northern Territory.

2. **Pandanus delestangii** Martelli in Proc. R. Soc. Qd **38**: 57-8, pl. XI. 1927 (as *de Lestangii* or *deLestangii*); St. John in Pacif. Sci. **21**: 523. 1967 (excl. syn.). *Type.–de Lestang* (FI holo; BRI, K), ii. 1925, 200 miles SW. of Burketown, NW. western Queensland.

3. **Pandanus kimberleyanus** St. John in Pacif. Sci. **15**: 180, f. 9. 1961. *Type.–W. V. Fitzgerald* 2395 (NSW holo), viii. 1906, Fitzroy River, West Kimberley, Western Australia.

4. **Pandanus spechtii** St. John in Pacif. Sci. **16**: 411, f. 139*b*, 140. 1962. *Type.– R. L. Specht* 1120 (BRI holo), x. 1948, Oenpelli, Arnhem Land, Northern Territory.

5. **Pandanus oblanceoloideus** St. John in Pacif. Sci. **23**: 95, f. 284. 1969. *Type.– S. T. Blake* 8694 (BRI holo), iv. 1935, Gregory River, Riversleigh, Queensland.

All species of this subsection are extremely similar, the only one with any degree of claim to specific rank being *P. kimberleyanus*, which is probably best reduced to a subspecific rank. I find the treatment by S. T. Blake (1954) quite acceptable. He accepts the name *P. aquaticus* F. Muell. although it first appeared as a "nomen provisorium", since later (1865) it was validly published. St. John (1967) did not accept *P. aquaticus*, but placed it in the synonymy of *P. delestangii* which is incorrect. St. John correctly states that the latter name was validly published by Martelli (1927). He also states that Mueller's name, *P. aquaticus*, was validly published in 1865 and that Blake "concludes correctly that his 'remarks ... are sufficient to validate the name' ". In these circumstances it is not correct to regard *P. aquaticus* as a nomenclatural synomym of *P. delestangii*. Ultimately St. John (1967, p. 527) advocates the recognition of *P. aquaticus* merely as "a valid name for a species so incompletely known that it should be left a species dubia, particularly as it is not safe to assume that only a single species of *Pandanus* can grow in one area". Therefore, we have to assume here that *P. aquaticus* was mistakenly included in the synonymy of *P. delestangii* in St. John's treatment and that what was intended was the retention of *P. aquaticus* as an incompletely known distinct species (its pistillate form not yet collected). Apparently the staminate inflorescence of *P. aquaticus* was sent to Kew (cf. Solms 1878). I have not seen this specimen.

It is true that the identification of species of *Pandanus* from the staminate inflorescences is difficult. There is, however, a leaf of the type also in existence (it is in the Melbourne Herbarium and, in fact, is the holotype). Anatomical study of this would throw some light on the problem.

In view of these difficulties, I will refrain from formally altering the nomenclature but would suggest that the following scheme be used for the time being.

(1) Consider that of the names given above one must be chosen and the rest either considered synonyms or maintained at subspecific rank;

(2) Provisionally continue to use the name *P. aquaticus* for this conservative treatment.

(3) Consider *P. kimberleyanus* as better qualified than the other taxa for ranking as a subspecies.

2. Subsect. **Elaphrocarpus** B. C. Stone, subsect. nov.

Phalanges 1-3-loculares, mesocarpio valde producto medulloso aerenchymatoso, endocarpio centrali c. 2 cm longo pariete 2-3 mm lato. Stigmata ut in subsectionem *Semikeura* sed majora.

Type Species.–Pandanus basedowii C. H. Wright (Northern Territory).

The name is derived from ελαφρος, meaning light-weight or agile, and καρπος, fruit. The subsection is monotypic.

6. **Pandanus basedowii** C. H. Wright in Bull. Misc. Inf. Kew 158, pl. 6. 1930; Blake in Aust. J. Bot. 2: 130, pl. 7 f. 4. 1954; St. John in Pacif. Sci. **16**: 416, f. 143. 1962; ibid. **23**: 89, 1969. *Type.–H. Basedow* (K), vi. 1928, high tableland (west of King River), Arnhem Land, Northern Territory.

P. basedowii is native in the Northern Territory, where it has been collected only a few times on cliffs and tablelands of Arnhem Land at about 1000 ft altitude. At first glance, the fruits of this species seem very different from *P. delestangii* and its relatives, and indeed they are unique in the genus in their unusually light weight in relation to their size (4.3-6.4 cm long and 2.6-5.6 cm thick, weighing only 15 g or less when dry). Wright (1930) thought they might be distributed by the wind. They are mainly 1-3-celled and the stigmatic position and structure are essentially the same as in *P. delestangii*. Staminate plants are unknown. The leaves are rather smaller than those of the other species mentioned but are similar in shape and texture and, in most respects, anatomically. There is a definite closeness in anatomical structure, more than is usual between different sections of the genus, but to the degree of difference which characterizes a clearly distinct species. In order to accommodate *P. basedowii* it seems necessary to establish a subsection for it.

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INDEX OF SPECIES IN CONTRIBUTIONS 3, 4, AND 5

New species names in bold type and synonyms in italics