A new Western Australian species of *Pandanus* subgenus *Pandanus* section *Semikeura (Pandanaceae)*

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Abstract

Stone, Benjamin C. A new Western Australian species of Pandanus subgenus *Pandanus* section *Semikeura* (Pandanaceae). Nuytsia 4(3): 427-433 (1983). *Pandanus rheophilus* Stone, belonging to subgenus *Pandanus* section *Semikeura* Stone, is described as a new species from Western Australia. It was discovered along streams on the Mitchell Plateau, near the Mitchell River Falls, in the north Kimberley region. It can be distinguished from the other taxa of the section by its larger drupes with longer endocarps.

Introduction

Recent botanical collections in the Mitchell Plateau area of the Kimberley region, north-west Western Australia, included specimens of a streamside pandan which pertained clearly to subgenus *Pandanus* section *Semikeura* Stone (1974) but which differ in several respects from all previously examined material of this section. Although the staminate plants have not been found, the fruiting material permits the recognition and the following description of this interesting new species.

Pandanus rheophilus Stone, sp. nov. (Figures 1-4)

Arbor usque ad 6 m alta, ramosa, ramis paucis divergentibus, modice elongatis, coronam foliaceam ferentibus. *Folia* attenuato-loriformia, pallide viridia, concoloria, usque ad 130-?140 cm longa, 6.3 cm lata, suberecta, apicem versus sensim attenuata, in flagellum inerme vel subinerme excurrentia; marginibus basi denticulis aciculiformibus antrorsis c. 3 mm longis, c. 6-12 mm dissitis; in medio denticulis similibus appressioribus et brevioribus c. 1-1.5 (-2) mm longis, c. 3-10 mm dissitis; apice c. 0.5—0.75 mm longis et 4-9 mm dissitis; denticuli in flagello sensim infrequentiores vel nulli. *Costa mediana* dorso denticulis antrorsis provisa, basi et in medio denticulis ad eos in margine adjacenti simillimis, apice et in flagello brevioribus et sensim remotius 8-27 mm dissitis, in extremo nullis. *Inflorescentia* terminalis. *Cephalium* pendulum globosum c. 18 cm diametro, e plurimis drupis (circiter 364-373) compositum, pedunculo c. 20 cm longo. *Drupa* unilocularis (rariter bilocularis, rarissime trilocularis) c. 6.7 cm c. 6.7-8 cm longa ad 1.5-2.5 cm lata, anguste cuneata, pileo acute pyramidali vel obtuse rotundato, vertice subconcavo, angulato c. 1 cm alto, stigmate obliquo ovato brunneo 2 mm longo terminata. *Mesocarpium* superum 27 mm longum, dense medulloso-fibrosum; inferum 8 mm longum, fibroso-pulposum. *Endocarpium* fusiforme, in parte dimidio inferiore locatum, 30 mm longum, 9 mm crassum, osseum, pariete ad 2 mm crasso. *Semen* fusiforme, 16 mm longum, endospermio albo. *Cetera* ignota.

Figure 1. *Pandanus rheophilus*. Habit of fruiting tree. (From *K. F. Kenneally* 7754, the type.)

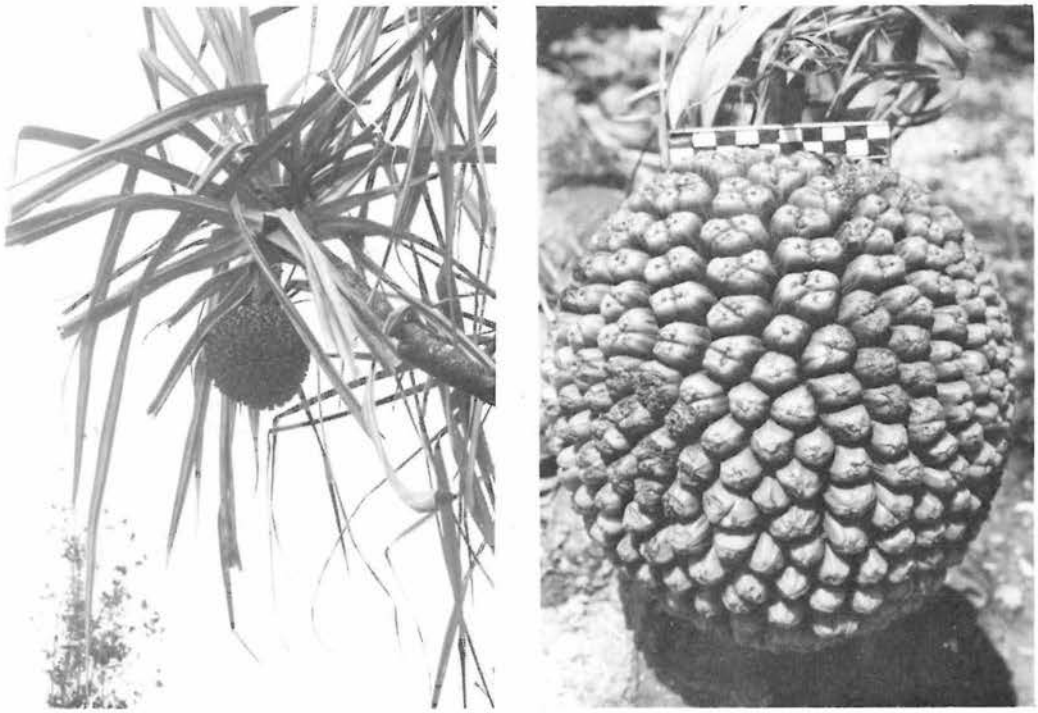

Figure 2. *Pandanus rheophilus*. A—Cephalium of *K. F. Kenneally* 7754 (the type). B—Cephalium in closer view showing the simple, bilocular and trilocular fruits. Note that the simple drupes are concentrated at the apex of the cephalium as is normal. Scale in cm. Photograph of *K. F. Kenneally* 8677.

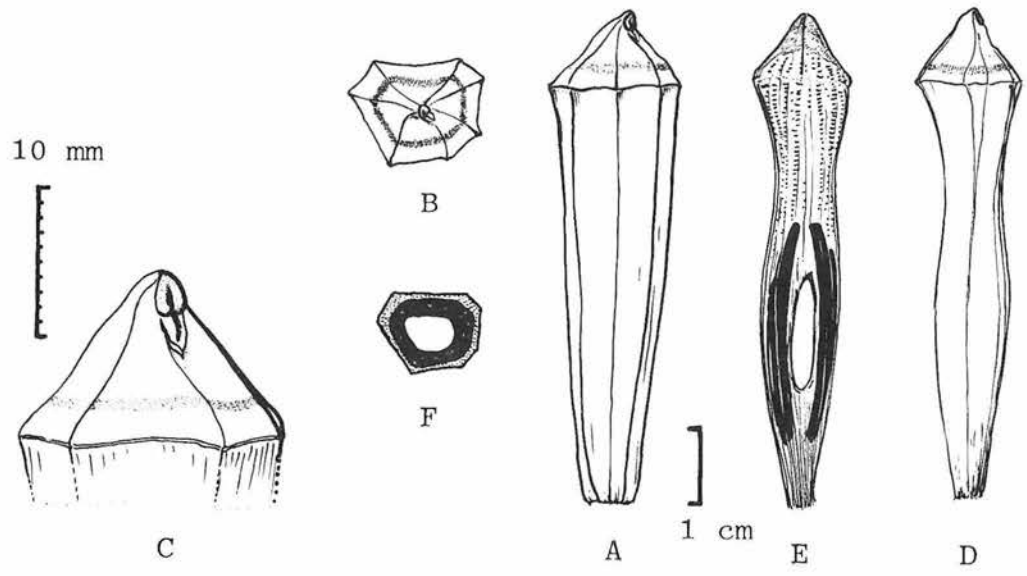

Figure 3. *Pandanus rheophilus*. Details of the fruits. A—Ripe drupe, fresh, in profile. B—The same in top view. C—The same, detail of pileus showing stigma and faint collar. D—Ripe drupe, dry, in profile. E—The same, in longitudinal section; endocarp in black, seed white. F—The same, trans-section of endocarp at midpoint. (All from the holotype, *K. F. Kenneally* 7754.)

Typus: Unnamed creek 9 km NW of Mitchell River Falls, 14°46'40"S, 125°37'20"E, north Kimberley, Western Australia. "Erect screw pine to 6 m. Leaves pale green. Fruits large. Phalanges orange when ripe. Common fringing ephemeral creek flowing amongst massive King Leopold Sandstone." 15 Jan 1982, *K. F. Kenneally* 7754 (holo: PERTH; iso: KLU).

Tree up to 6 m tall, branched, the branches rather few, diverging, moderately elongated, bearing the crown of leaves. *Leaves* narrowly strap-shaped, gradually narrowed to the prolonged slender apex, pale green, up to about 130-140 cm long, to 6.3 cm wide, erect to drooping. *Leaf margins* toward the base with acicular forwardly directed teeth about 3 mm long, and 6-12 mm apart; toward the middle, with similar but more appressed, shorter teeth, about 1-1.5 (2) mm long and 3-10 mm apart; toward the apex the teeth still smaller, about 0.5-0.75 mm long, and 4-9 mm apart; on the flagellum, the teeth gradually sparser or lacking. *Midrib* on dorsal side provided with forwardly directed teeth, at and near the base and near the middle similar in size and spacing to those of the adjacent margins, along the apex and the flagellum slightly shorter and successively more distant, 8-27 mm apart, at last absent. *Inflorescence* terminal, the pistillate head solitary, pendulous, globose, about 18 cm in diameter, composed of numerous (about 364-373) mostly 1-celled (rarely 2- or very rarely 3-celled) drupes. *Drupe* about 6.7-8 cm long, c. 1.5-2.5 cm wide, narrowly cuneate, the pileus acutely pyramidal, about 1 cm high, terminating in the oblique ovate brown 2 mm long stigma. *Upper mesocarp* 27 mm long, densely medullose-fibrous. *Lower mesocarp* 8 mm long, pulpy-fibrous. *Endocarp* fusiform, situated in the lower half of the drupe, 30 mm long, 9 mm thick, bony, dark brown, the walls c. 2 mm thick. *Seed* fusiform, 16 mm long, the endosperm white. Other details unknown.

Other collection examined. Unnamed tributary to the Mitchell River, North Kimberley, (14°45'S, 125°38'E) Common fringing ephemeral creek flowing amongst massive King Leopold Sandstone; screwpine to 6 m; leaves blue-green; old inflorescences remaining attached to stem; fruit (cephalium) large consisting of 364 drupes (plus 8 two-celled and one three-celled phalanges). 8 December 1982, *K. F. Kenneally* 8677 (KLU, PERTH).

Derivation of the name. From Greek, *rheos* = stream, *philo* = to love, hence *rheophilus*, a stream-lover, in allusion to the ecology and habitat of the species.

Discussion

Of the five species so far described which are consectional under subgenus *Pandanus* section *Semikeura* Stone, two have so far been reported from Western Australia (*P. kimberleyanus* H. St. John and *P. aquaticus* F. Muell.). In my review of this section, which included its first description, I explained why most of the described species should be regarded as likely synonyms of the earliest named member of the group, *P. aquaticus* F. Muell. (Stone 1974). Previous collections from Western Australia were few. Three of these, all by W. V. Fitzgerald, collected in 1906, were assigned by St. John to his new species *P. kimberleyanus* (St. John 1961). All these collections were from the same locality, the Fitzroy River. Although in my review of section *Semikeura* (Stone 1974) I regarded *P. kimberleyanus* as perhaps a synonym of *P. aquaticus*, I remarked that the former was "better qualified than the other taxa for ranking as a subspecies." This and the other three taxa *(P. delestangii* Martelli, from Queensland, *P. spechtii* H. St. John, from Northern Territory, and *P. oblanceoloideus* H. St. John, from Queensland) all agree very closely in the chief diagnostic characteristics of the fruits. In particular, they agree in drupe size, this

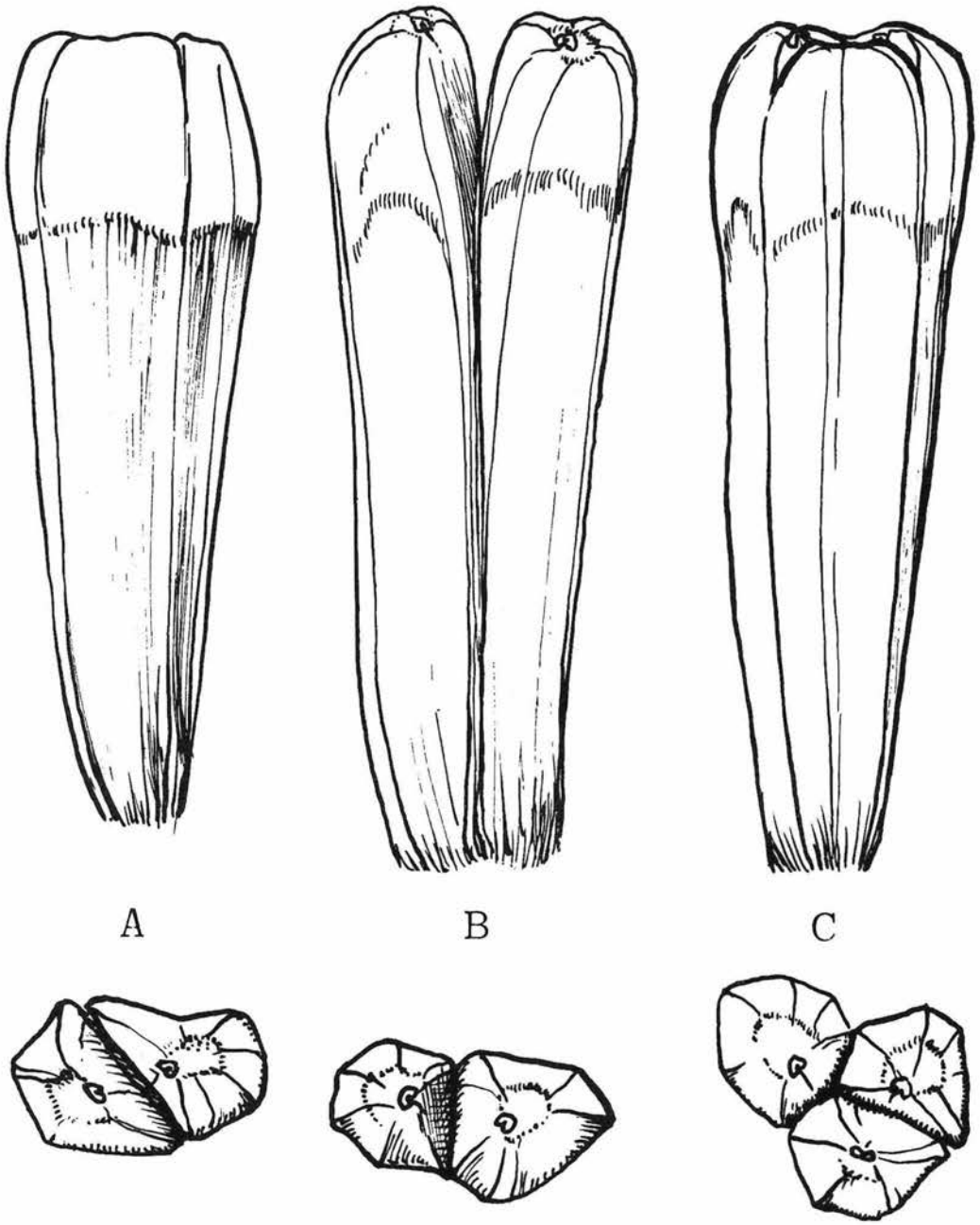

Figure 4. *Pandanus rheophilus*. Details of the fruits; two- and three-celled phalanges from *K. F. Kenneally* 8677. A—2-celled phalange with opposed carpels and unified apex. B—2-celled phalange with subopposed (nearly laterally paired) carpels with separate apices. C—3-celled phalange. Upper views show profiles, lower views corresponding top views.

being 35-44 mm long (31-35 mm for *P. delestangii*, 38-41 mm for *P. oblanceoloideus*, and 39-44 mm for *P. spechtii*). For *P. aquaticus*, no comparable measurements from the type specimen can be made since the type is a staminate specimen; but most probably the Queensland populations called *P. delestangii* and the Northern Territory populations called *P. spechtii* are the most similar to the original population sampled by von Mueller which furnished the type of *P. aquaticus*, which was in the Victoria River, Northern Territory.

The drupes of *Pandanus kimberleyanus* H. St. John are 25-28 mm long, and seem to be thus in a different size class. This taxon also has a somewhat different pileus form which is very low, rounded and with a small subconcave aerola at the vertex beside the stigma. For this reason, the taxon should perhaps be regarded as of specific or subspecific status.

In *Pandanus rheophilus*, the drupes are 67-80 mm long, and the drupe apex is broadly pyramidal to obtusely rounded-angulate with a subconcave vertex. The endocarp is slender, fusiform, elongated (30 mm long), and is located approximately in the lower half of the drupe. In all other described consectional taxa, the endocarp is central and much shorter, only 9-11 mm long. In these characters, *P. rheophilus* stands out, and species status seems amply justified despite the minimal representation of the taxon (only the type and one other collection are known so far).

The characteristics of the different described taxa can be noted in the tabular comparison (Table 1).

Table 1. Some drupe characteristics in section *Semikeura.*

Nominal Species	Drupe length	Drupe apex shape	Endocarp length/position
delestangii	31-35 mm	subacute-rounded	8-11 mm/submedian
oblanceoloideus	38-41 mm	acute to subacute—rounded	10-11 mm/submedian
spechtii	39-44 mm	acute to subacute—rounded	9 mm/submedian to slightly supramedian
kimberleyanus	25-28 mm	rounded with small concavity	7-8 mm/submedian
rheophilus	67-80 mm	conic-pyramidal to obtusely rounded—angulate with subconcave vertex	30 mm/subbasal, occupying lower half of drupe

From the data in Table 1, and from the descriptions of the taxa named, it seems useful for the time being to regard the three taxa, *P. aquaticus, P. kimberleyanus*, and *P. rheophilus*, as species. The other taxa previously described, *P. delestangii P. spechtii* and *P. oblanceoloideus*, should definitely be regarded as clear synonyms of *P. aquaticus.*

A key for the determination of the three species follows.

Key to species of section *Semikeura*

1. Drupes 25-28 mm long; endocarp submedian, 7-8 mm long; drupe apex rounded, with a small concave areola beside the stigma . . *P. kimberleyanus*
   Drupes longer, mostly 31-68 mm long; endocarp submedian or subbasal; drupe apex acute to subacute rounded or pyramidal 2

2. Drupes 31-44 mm long; endocarp submedian, 9-11 mm long; drupe apex acute to subacute rounded . . . . . *P. aquaticus*
   Drupes 67-80 mm long; endocarp subbasal, 30 mm long; drupe apex conic-pyramidal to obtusely rounded-angulate with subconcave vertex . . . . . *P. rheophilus*

Kenneally (pers. comm.) notes that in *P. rheophilus* (and specifically in his number 8677) the leaves are noticeably bluish green, while in *P. aquaticus* (and *P. kimberleyanus*) the leaves are a more yellowish-green.

Ecology

Further collections of this interesting group of species are needed in order to obtain data for further analysis concerning variability in fruit size in the various populations; to obtain staminate materials in more abundance to ascertain if staminate characters can be utilized to substantiate the taxonomic arrangement; and to provide an insight into whether there are any differences in vegetative characters between these taxa. Also desirable would be further ecological studies, as there seem to be some interesting correlations with fauna. St. John (1967) quotes A. de Lestang's letter to W. D. Francis which mentions details of phenology and habit, and describes the behaviour of white cockatoos (*Cacatua galerita*) which "systematically comb the *Pandanus* for syncarps; beginning in February, they tear down each drupe in quest of a kind of fly larvae . . . the greater part of the drupes fall in the water below where herds of turtles gluttonously swallow whole the falling drupes; those falling upon the banks are not lost either, for when all the *Pandanus* are clean of syncarps, the cockatoos search the ground carefully for the dry nuts and with their powerful beak crush and extract the edible parts." The mention of turtles is particularly significant here, since the riverine ecological preference and the drupe form both seem to suggest that ingestion of the drupes by turtles is likely. This relationship of pandans and turtles has been demonstrated in Malaya between the Perak River terrapins (*Batagur baska*) and the riverine pandan *Pandanus helicopus*. Fruit distribution in *Pandanus helicopus* is certainly due in part to consumption of drupes by the terrapins. The same may be true for the pandans of section *Semikeura*, including *P. rheophilus*.

Acknowledgements

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