



Update on the systematics of *Benstonea* (Pandanaceae): When a visionary taxonomist foresees phylogenetic relationships

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Abstract

The paleotropical monocot Pandanaceae family comprises c. 700 species distributed into five genera: *Benstonea* (c. 60 spp.), *Freycinetia* (c. 250 spp.), *Martellidendron* (6 spp.), *Pandanus* (c. 450 spp.) and *Sararanga* (2 spp.). *Benstonea* was circumscribed to include species previously placed in *Pandanus* section *Acrostigma* (one of the four sections of *Pandanus* subgenus *Acrostigma*). New phylogenetic data show that the six species of the remaining three sections of subgenus *Acrostigma* (sections *Epiphytica*, *Fusiforma* and *Platystigma*) and a seventh species doubtfully placed in section *Acrostigma* (*Pandanus microglottis*) also belonged to *Benstonea*. This genus is therefore characterized by a suite of morphological characters, viz. stigmatic groove on the adaxial side of the stigma and a staminate flower reduced to 1 to 3 free stamens (sometimes joined at base). We therefore make here the necessary seven new combinations accompanied by one lectotypification in *Benstonea*, a genus that now reflects the view of the visionary Benjamin Stone who had already grouped these species in *Pandanus* subgenus *Acrostigma* based solely on morphology.

Introduction

The arborescent or lianoid dioecious monocot family Pandanaceae has c. 700 species distributed throughout the paleotropics. Five genera have been recognized within the family: *Benstonea* Callmander & Buerki (in Callmander *et al.* 2012: 328) (c. 60 spp.), *Freycinetia* Gaudichaud (1824: 509) (c. 250 spp.), *Martellidendron* (Pichi-Sermolli in Martelli & Pichi-Sermolli 1951: 20) Callmander & Chassot (in Callmander *et al.* 2003) (6 spp.), *Pandanus* Parkinson (1773: 76) (c. 450 spp.) and *Sararanga* Hemsley (1894: 216) (2 spp.). The systematics of this family has puzzled generations of botanists due to the apparent convergence/homology of key morphological characters (especially in its largest genus *Pandanus*, see Buerki *et al.* 2012). A recent molecular analysis based on plastid data greatly contributed to our understanding of the evolution of this family and provided evidence to i) support new generic circumscriptions and ii) assess the infra-generic classification within *Pandanus* (Buerki *et al.* 2012). One of the main results of this study was to show the paraphyly of *Pandanus*: the species of *Pandanus* section *Acrostigma* Kurz (1867: 100) formed a distinct lineage, now described as the genus *Benstonea* (Buerki *et al.* 2012, Callmander *et al.* 2012). Only species from *Pandanus* section *Acrostigma* were included in *Benstonea* (except *P. microglottis* Stone (1982: 34), doubtful sectional placement; see Stone, 1982, 1993) since only species belonging to this section were included in the phylogenetic inference. *Pandanus* subgenus *Acrostigma* (Kurz) Stone (1974: 521) included three other sections: *Epiphytica* Martelli (1904: 304), *Fusiforma* St. John (in Holttum & St. John 1962: 227) and *Pseudoacrostigma* Stone (1971: 146) in Stone's (1974, 1978, 1983) classification. This subgenus was based on the constant adaxial disposition of the stigmatic groove on the apex of each drupe and stamens solitary or in triads (where in triads, free or very slightly joined at the base). Callmander *et al.* (2012) did not transfer all four