New Australian *Nepenthes* taxa published since Allen Lowrie's Magnum Opus

Richard Nunn • Sydney • Australia • richardjnunn1@gmail.com

Nepenthes L. is a genus comprising at least 160 accepted species chiefly distributed in Southeast Asia, with centres of diversity in Borneo, Sumatra, and the Philippines, with disjunctions in Madagascar, Sri Lanka, India, Seychelles, New Caledonia, and Australia (Clarke *et al*. 2018).

The number of *Nepenthes* species recorded in Australia has changed greatly since the days of Bailey (1881, 1897, 1898, 1899, 1905) and von Mueller (1866) who reported 11 species, and Danser (1928) who subsequently reduced them to synonyms of *N. mirabilis* (Lour.) Druce. Treatments of the genus by Stanley (1982), Jebb and Cheek (1997), and Cheek and Jebb (2001) followed Danser. Clarke and Kruger (2005), after viewing Bailey's original type material held at Brisbane Herbarium (BRI) and detailed field observations, re-instated one of Bailey's collections, *N. rowaniae* F.M.Bailey, as a distinct species. Whilst completing these field studies Clarke and Kruger encountered a *Nepenthes* taxon that was not readily identifiable and didn't match any herbarium specimens, which they concluded was a new species and described *N. tenax* C.Clarke & R.Kruger in 2006. Lowrie (2014) supported three species, *N. mirabilis*, *N. rowaniae*, and *N. tenax* in Magnum Opus and this treatment remained the accepted protocol until 2016, when a fourth Australian species was described, *Nepenthes parvula* G.W.Wilson & S.Venter.

Nepenthes parvula G.W.Wilson & S.Venter 2016

Clarke & Kruger (2006) found a single population of a "small form" of *Nepenthes tenax* growing in a permanently-inundated site in a swamp on the flood plain of the Jardine River and they observed that this form "bears the smallest functional aerial pitchers of any *Nepenthes*" with pitchers that are "at most 50 mm high". Other personal accounts of this diminutive taxon have been recorded after field studies of the Jardine River area. The authors of this new taxon (Wilson & Ventor 2016) conducted several field surveys in northern Queensland during the Dry Season (May to November) from 2010-2015 to northern Cape York. The population of the proposed new taxon appeared clearly distinct from *N. tenax* on basis of morphological and ecological characteristics and lead to its formal description in 2016.

Figure 1: *Nepenthes parvula* growing in Sanamere Lagoon, Cape York, Queensland, Australia. Photo by Richard Nunn.

Nepenthes parvula is an erect subshrub 0.35(−0.50) m tall (Fig. 1). The epithet *parvul*a refers to the small size of mature plants. *Nepenthes parvula* occurs in Queensland, Cape York only growing on freshwater swamps in the lower Jardine River catchment

Figure 2: Typical habitat for *Nepenthes parvula*, Sanamere Lagoon, Cape York, Queensland, Australia. Photo by Richard Nunn.

(Fig. 2). This ecosystem does not burn in the wildfires that irregularly but not infrequently sweep across the landscape and as result *N. parvula* is characterised by a retained "skirt" of lower pitchers. *Nepenthes parvula* is similar to *N. tenax* from which it differs in having small aerial pitchers (35-60 × 10-15 mm), red colour of the upper surface of the lid on aerial pitchers, more dense nectar glands (250-300 per cm^2 vs. 100-150 per cm^2) on the abaxial surface of the pitcher lid, smaller male flower, much shorter mature fruit, and restriction to an ever-wet environment.

Robinson (2020) in Flora of Australia suggests the principally size-based distinction is poorly supported genus-wide given the inherent variability of even single species populations studied across the range of the genus, and in-situ comparisons of *N. tenax* and *N. parvula* found that it was sometimes challenging to distinguish between them, with various intergrades noted (A. Robinson, pers. obs).

However, Wilson and Venter (2016) indicate that the ecology of this taxon is distinct, and that plants of *N. tenax* and *N. parvula* grown under identical conditions respond differently, particularly in terms of their temperature tolerances (Wilson & Venter 2016). It is worth noting that the Sulawesian *N. minima* is likewise separated from *N. maxima* based primarily on its diminutive dimensions, appearing otherwise much like its larger counterpart, but genetic analyses seem to support this separation (Nauheimer *et al*. 2019) and similar analyses of the Australian *Nepenthes* taxa may provide valuable insight into the quality of their separation.

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