



Nepenthes parvula (Nepenthaceae), a new species from Cape York, Queensland, Australia

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Abstract

A new species, *Nepenthes parvula* (Nepenthaceae), is described from Cape York Peninsula, Queensland, Australia. The species is regarded as new based on the overall small stature, small mature pitchers and the old leaves with pitchers that are retained, distinct fine-scale morphological characteristics, and discrete habitat occupied.

Keywords: Cape York, conservation, IUCN, *Nepenthes*, taxonomy

Introduction

Nepenthes Linnaeus (1753: 955) is the only genus belonging to the family Nepenthaceae Dumort., including about 160 species, which are distributed in Southeast Asia and Malesia with disjunctions in Madagascar, Sri Lanka, India, Seychelles, New Caledonia, and Australia (Cheek & Jebb 2001, 2014, Clarke 1997, 2001).

The number of *Nepenthes* species recorded in Australia changed greatly during the last 149 years. Bailey (1881, 1897, 1898, 1899, 1905) and von Mueller (1866) reported 11 species, while Danser (1928) reduced them to synonyms of *N. mirabilis* (Loureiro 1790: 606) Druce (1916: 637). Treatments of the genus by Stanley (1982), Jebb & Cheek (1997) and Cheek & Jebb (2001) followed Danser. Three species, *N. mirabilis*, *N. rowaniae* F.M.Bailey (1897: 231) and *N. tenax* C.Clarke & R. Kruger (2006: 319–324) are currently recognised as occurring in Queensland (Bostock & Holland 2010).

In the past three decades a taxon named as *Nepenthes* ‘mini-tenax’ (the epithet refers to the morphological similarity with *N. tenax*), has been recognised by enthusiasts and collectors, i.e. G. Bourke (pers comm. in 2014), A. Field (pers comm. in 2015). Lavarack (1981) discussed this taxon through the study of a collection from Cape York showing pitchers not more longer than 50 mm. Clarke & Kruger (2006) found a single population of a “small form” of *N. 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”. A search of web sites showed *Nepenthes* ‘mini-tenax’ was being offered for sale either as plants or as seed, e.g. in 2015 Triffid Nurseries of Suffolk, England (www.triffidnurseries.co.uk) was offering seed at three pounds sterling a packet, the source location for it being given as Sanameer (sic) Lagoon on Cape York.

As part of ongoing studies (molecular, ecological and biogeographical) of Australasian *Nepenthes* (see Wilson *et al.* 2011), the population of the proposed new taxon found appears clearly distinct from *N. tenax* on basis of morphological and ecological characteristics and leads us to propose it as a new species.

Material and methods

Field surveys were carried out in northern Queensland during the Dry Season (May to November) in 2010, 2011, 2012, and 2015 to northern Cape York. We surveyed the distribution of 636 *Nepenthes* plants in eight transects (100 × 2 m) at Jardine Swamp, Cowal Creek, Sanamere Lagoon, and swamps about Packsaddle Creek, all in the Jardine River catchment to ascertain if the three recognised and the proposed species at these sites occupied discrete habitats.

Exsiccata were deposited in CNS (acronym according to Thiers 2016, continuously updated). Also living collections in the Australian Tropical Herbarium shade house in Cairns was examined to monitor their growth habit and phenology.

Taxonomic treatment

Nepenthes parvula G.W. Wilson & S. Venter, *sp. nov.*

Type:—AUSTRALIA. Cape York, 'Jardine Swamp', 11° 06' 17.85"S, 142° 20' 13.45"E, 20 m, female fl. 27 August 2012, *Wilson & Venter 724* (holotype CNS!, isotype BRI!).

Diagnosis:—*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 cm² vs. 100–150 per cm²) on the abaxial surface of the pitcher lid, smaller male flower, much shorter mature fruit, and restriction to an ever-wet environment.

Description:—*Erect subshrub* 0.35(–0.50) m tall. *Stems* circular in cross section (diameter 2.5–5.0 mm), internodes 0.5–5.0 mm long at base and 2.0–10.0 mm near apex; indumentum tomentose with white-coloured simple hairs and dark-coloured stellate hairs. *Lower leaves* coriaceous, sessile, linear-lanceolate, 10–25 × 5–10 mm, slightly to moderately arched, apex attenuate-acute, base contracting gradually towards the petiole, clasping the stem for 2/3 of its circumference, margin sparsely fimbriate; longitudinal nerves 4–6 per side, evenly spaced; pennate nerves rectangular with longitudinal nerves. Tendril straight, 5–10 mm long, about 0.8 mm in diameter, insertion simple; indumentum as stem. *Upper leaves* coriaceous, sessile, linear-lanceolate, 30–90 × 7–14 mm, moderately arched, V-shaped in cross section, apex attenuate-acute, base contracting gradually towards the petiole, clasping the stem for 2/3 of its circumference, margin entire (rarely slightly fimbriate); longitudinal nerves 3–4 on each side of the midrib, on outer 3/5 of blade, pennate nerves rectangular with longitudinal nerves, except between the outermost nerve and margin where they are at 45°. Tendril kinked (sometimes coiled) 30–60 mm long, 0.8–1.0 mm diam., insertion simple; indumentum as stem. *Lower pitchers* ovoid, 15–30 × 5–10 mm, constriction below midpoint, nectar gland density 900–1200 per cm²; alae extend length of pitcher but reducing towards the base, fimbriate in upper portion, fimbriae 0.4–1.2 mm long; mouth oblique and subovate; peristome subcylindrical to slightly flattened, 0.4–1.2 mm broad, ribs 0.05–0.2 mm apart, 0.05–0.10 mm high, outer margin entire, revolute, inner margin dentate, teeth slightly curved; lid sub-orbicular, 5–14 × 3.2–13.0 mm, flat, no appendage, apex rounded; crateriform glands evenly distributed; spur straight, simple (sometimes bifurcate or multiple), 1.0–3.5 mm long. *Upper pitchers* cylindrical, 35–60 × 10–15 mm, constriction below midpoint, nectar gland density 1200–1500 per cm²; alae reduced to ridges with an entire margin, 0.1–0.3 mm wide; mouth oblique and subovate; peristome subcylindrical to slightly flattened, 1–2 mm broad, ribs 0.15–0.4 mm apart, 0.05–0.15 mm high, outer margin entire, revolute, inner margin dentate, teeth slightly curved, 0.1 mm long; lid sub-orbicular, 10–20 × 10–15 mm, vaulted, lower surface consistently deep red in colour, no appendage, apex rounded (sometimes slightly indented); crateriform glands evenly distributed, 250–300 per cm², suborbicular 0.15–0.20 mm, with a thin marginal rim; spur straight, simple (sometimes bifurcate), 2.5–6.0 mm long. *Male inflorescence* a raceme, up to 100 mm long, peduncle 25–50 mm long; bracts absent; rhachis 25–50 mm long, indumentum dense except on adaxial surface of tepals and staminal column, hairs simple, white; up to 50 flowers, 1(–3)-flowered, pedicel 2.5–5.0 mm long, no bracteole; tepals 2.0–3.5 × 1.0–2.5 mm, nectar glands on red-coloured adaxial surface of tepals; staminal column 0.8–1.3 mm long, anther-head about 1.5 mm in diameter. *Female inflorescence* up to 100 mm long, peduncle 40–60 mm long, bracts absent; rhachis 40–60 mm long; up to 35 flowers, partial-peduncle 1-flowered, 3-locular, pedicel 2.5–5.0 mm long, no bracteoles; tepals 2.5–3.0 × 1.5 mm, nectar glands on red-coloured adaxial surface of tepals, indumentum dense except on adaxial surface of tepals and stigma surface, hairs simple, white; capsule 3.5–6.0 mm long and seeds 2.7–3.5 mm long.

Etymology:—The epithet *parvula* refers to the small size of mature plants.

Phenology: Plants of *Nepenthes parvula* and *N. tenax* grown in identical conditions at the Australian Tropical Herbarium in Cairns maintained the characteristics described here and in Clarke & Kruger (2006). However, in contrast with *N. tenax*, *N. parvula* shows a marked susceptibility to cooler temperatures and plants at CNS in the lowland tropics of North Queensland either die or die back in the Dry Season when overnight temperatures drop to 10–12°C. This response had previously been noted by other workers, e.g. C. Clarke pers comm. in 2013, P. Lavarack pers comm. in 2014, A. Field pers comm. in 2014.

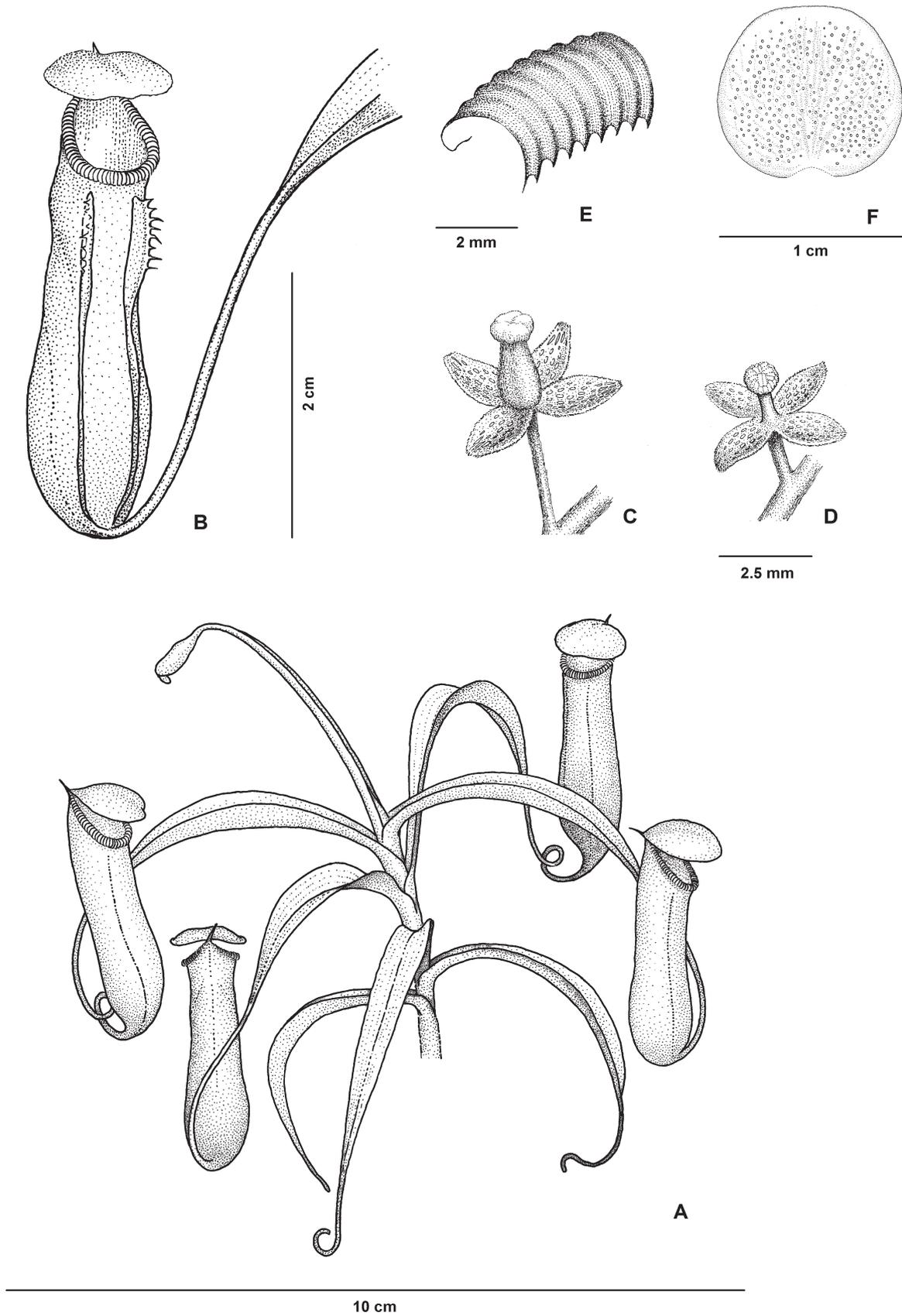


FIGURE 1. *Nepenthes parvula* **A** habit with upper pitchers; **B** lower pitcher showing alae with fimbriae; **C** female flower, showing nectar glands on adaxial surface of tepals; **D** male flower; **E** section of peristome showing teeth on inner margin; **F** lid of upper pitcher, lower surface. **A,B,C,E,F** from *Wilson & Venter 724* (CNS-138857), **D** from *Wilson & Venter 745* (CNS-140326). Drawings by I. Noziac.

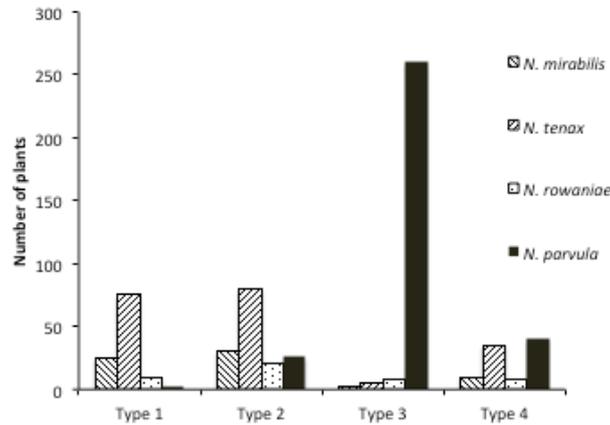


FIGURE 2. The habitat association of four species of *Nepenthes* in the eight transects at Jardine Swamp Cape York, Queensland (data summed for analysis). Type 1: Dry *Acacia*-dominated with *Melaleuca* sp. Shrubland or Low Woodland with scattered *Hakea pedunculata*, *Banksia dentata* and *Asteromyrtus lysicephala* on siliceous sands on sand sheets and slight rises; Type 2: Seasonally inundated ecotone with scattered *Hakea pedunculata* and *Asteromyrtus lysicephala* with *Baloskion tetraphyllum* and herb species (often carnivorous) on siliceous sands. Type 3: Permanently moist/inundated swamp with water pH~5 dominated by forbs, herb species, (often carnivorous), and dwarf *Asteromyrtus lysicephala* on a variable peat layer on a siliceous sand substrate. Type 4: Permanently moist/inundated swamp dominated by *Ghania* sp. ±*Hanguana malayana*, on a variable peat layer on a siliceous sand substrate—slightly (10–20 mm) elevated above 3.

TABLE 1. Morphological comparison between *Nepenthes parvula* and *N. tenax*.

	<i>N. parvula</i>	<i>N. tenax</i>
Leaf size on erect stems	30–90 × 7–14 mm	110 × 25 mm
Upper pitchers	Cylindrical, variably ovate in the lower third	Infundibuliform, narrowing towards the base
	35–60 × 10–15 mm	80–160 × 20–34 mm
Pitcher lid nectar glands	250–300 per cm ²	100–150 per cm ²
Inflorescence length	≤ 100 mm	≤ 160 mm
Size of male flower	2.5–3.5 × 3.5–5.5 mm	4.5–6.0 × 6.0–9.0 mm
Staminal column length	≤ 1.3 mm	about 4 mm

Distribution and ecology:—*Nepenthes parvula* occur in Queensland, Cape York only growing on freshwater swamps in the lower Jardine River catchment, at 0–30 m a.s.l. The surveys by us show *N. parvula* is restricted to Regional Ecosystem 3.3.64a “*Palustrine wetland (e.g. vegetated swamp)*” (Queensland Herbarium 2015). The surveys also show that the other three species of *Nepenthes* occur, although rarely (i.e. *N. mirabilis*, *N. tenax* and *N. rowaniae*) (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 (refer Fig. 3B). Plants of *N. parvula* were in flower or had mature fruit dehiscing seed when the type was collected in September 2012.

Conservation status:—The compact nature of mature plants and small size of the aerial pitchers of *N. parvula* make it desirable to collectors. Illegal collections of both seed and plants occur (S. Templeton, pers comm. August 2013, A. Field, pers comm. May 2015). Damage by feral pigs (pers obs. 2012, 2013, and 2015) is an ongoing concern. Field surveys indicate that the EOO is ≤ 20 km², the AOO is ≤ 5 km², and the number of plants is more than 5000. However, due to difficulties in accessing much of the potential habitat and working in peat swamps inhabited by Estuarine Crocodiles (*Crocodylus porosus* Schneider, 1801), determining exact values is difficult and our values are conservative. We propose a Conservation Status of Vulnerable under the criterion B1a+B2a of IUCN (2015).

Additional material examined:—AUSTRALIA, Queensland, Jardine Swamp, 11° 06' 17.85"S, 142° 20' 13.452"E, 27 August 2012, *ibidem* Wilson & Venter 713 (♀) (CNS-137416), *ibidem* Wilson & Venter 714 (♀) (CNS-137417), *ibidem* Wilson & Venter 715 (♀) (CNS-137418), *ibidem* Wilson & Venter 716 (♀) (CNS-137419), *ibidem* Wilson & Venter 720 (♂) (CNS-138853), *ibidem* Wilson & Venter 721 (♂) (CNS-138854), *ibidem* Wilson & Venter 722 (♂) (CNS-138855), *ibidem* Wilson & Venter 723 (♀) (CNS-138856), *ibidem* Wilson & Venter 724 (♀) (CNS-138857); Wilson & Venter 745 (♂) (CNS-140326) AUSTRALIA, Queensland, Jardine Swamp, 11° 06' 08"S 142° 20' 10"E, 25 July; Wilson & Venter 746 (CNS-134394); Queensland, Packsaddle Creek 11° 04' 50"S, 142° 25' 07"E, 27 July 2013, 2 km South of the Usher Point Road, Heathlands Resources Reserve, Cape York.



FIGURE 3. *Nepenthes parvula* **A** habit with upper pitchers; **B** male plant with inflorescence with receptive flowers (l) and opened flowers (r); **C** female inflorescence; **D** male inflorescence. Images by S. Venter.

Acknowledgements

We thank to the Directors and Curators of the herbaria consulted (BRI, CNS, CANB) for access to the collections. We also thank C. Clarke and A. Field (James Cook University) for useful discussions on *Nepenthes* in Australia, and S. Templeton (Queensland Department of Agriculture and Fisheries Quarantine Station, Coen) for discussions on poaching of *Nepenthes* in Queensland. M. Cheek (K) made useful suggestions on earlier drafts of this manuscript. Collections were made under Department of Environment & Resource Management permit WISP05396710.

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