

***Wurmbea fluviatilis* (Colchicaceae), a new riverine species from the Gascoyne region of Western Australia**

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Abstract

Macfarlane, T.D. & Case, A.L. *Wurmbea fluviatilis* (Colchicaceae), a new riverine species from the Gascoyne region of Western Australia. *Nuytsia* 21(1): 25–30 (2011). A new species of *Wurmbea*, *W. fluviatilis* T.Macfarlane & A.Case, is described and illustrated with photographs and a distribution map. The new species is known from only three populations from the Gascoyne River catchment in the region of Mount Augustus, growing on river banks and beside riverside pools. It is a relatively tall, attractive species with bi-coloured flowers.

Introduction

A number of new species of *Wurmbea* Thunb. (Colchicaceae) have been discovered in Western Australia in recent years, most of them in the more arid regions outside of the better-collected south-west of the State. Following on from the description of *W. inflata* (Macfarlane & Case 2007), this is the second species to be described recently from the Gascoyne region. *Wurmbea* has been extensively studied taxonomically in Australia (Macfarlane 1980, 1987; Bates 1995, 2007) so the recent surge in discoveries is surprising, but is a consequence of targeted field work in under-collected areas at appropriate times.

The new species described here was first collected during unrelated fieldwork by R.J. Chinnock in 1986 and lodged in the South Australian Herbarium (AD), where it was identified as *Wurmbea deserticola* T.Macfarlane by R.J. Bates in 1994. In 1996 A.L. Case with colleague Bill Cole independently found it at a second location while engaged in field work for a study of sexual systems in *Wurmbea* (Barrett & Case 2006, Case *et al.* 2008), immediately recognised it as a new species, and soon after saw the Chinnock specimen at AD. Subsequent field work by T.D. Macfarlane, A.P. Brown and C.J. French has improved our understanding of the species but has not revealed any more populations other than one casually recorded photographically by A.P. Brown and J. Brown in 2006.

Description

Wurmbea fluviatilis T. Macfarlane & A. Case, *sp. nov.*

Wurmbea monanthae (Endl.) T. Macfarlane similis sed floribus plus numerosis, centro floris atroroseo, habitatione riparia differt.

Typus: Gum Creek, [Mt Augustus Station], Western Australia, 29 June 2006, *T.D. Macfarlane, A.P. Brown & C.J. French* TDM 3889 (*holo:* PERTH 08230447, *iso:* CANB, MEL).

Wurmbea sp. Thomas River A. Case & B. Cole 58, Western Australian Herbarium, in *FloraBase* <http://florabase.dec.wa.gov.au/> [accessed November 2010].

Plants tall, 15–55 cm tall. *Corms* not studied. *Leaves* 3, well-spaced apart, lower two dissimilar, sometimes relatively shortly but still distinctly separated. *Lowest leaf* basal, from 2/3 to almost equalling the top of the inflorescence, lamina channelled, broad, 2–4 mm wide in the lower part, not dilated or slightly to noticeably dilated at base, more or less linear but gradually tapering to a fine apex. *Second leaf* with a tubular sheath 2–3 cm long, the lamina base markedly dilated, the remainder of the lamina, up to 10 times as long as the dilated part, relatively broad at the base and tapering evenly to fine apex, erect, usually reaching to the inflorescence, occasionally exceeding it. *Third leaf* with the tubular sheath long, the sheath/lamina transition strongly dilated for 2.5–3.5 cm, narrowing rather abruptly to the tapering acute distal part of the lamina which is shorter than or up to 3 times as long as the dilated part, erect, only occasionally reaching to the lower flowers. Peduncle long, (2)6–8 cm. *Inflorescence* an open spike of 3–10(–13) flowers, the lower internodes 5–20 mm long. *Flowers* all hermaphrodite or occasionally the uppermost male, bicoloured, dark pink at centre including the tepal claws and the nectaries but not including the proximal part of the staminal filaments, the remainder white to very pale pink. *Tepals* 6, 8–9 mm long, connate very shortly at the base for 0.5–1 mm (1/16–1/9 of their length), narrow below the nectary, broadening abruptly above it to form a broadly elliptical to sub-orbicular widely spreading limb, the apex obtuse to rounded. *Nectary* one on each tepal, at or slightly below 1/3 from the base, a curved, thickened and rather rigid structure with shelf-like projections on either side, continuous across the tepal from margin to margin, the distal margin indistinct, curving or moulded around the filament and appearing to clasp it when dried. *Stamens* 6, 2/3 as long as the perianth; filament adnate to the perianth well beyond the perianth tube and extending almost to the nectary, not swollen in lower part, tapering gradually to the anther attachment; anther oblong, 1.7–1.8 mm long, attached at or below the middle, dehiscing by longitudinal slits, dark red. *Ovary* obloid to ellipsoid, 2.6–3 mm long at anthesis; carpels 3, connate at the axis to the apex, the wings free but appressed to each other, with *c.* 22–24 ovules per locule; styles 3, clearly delimited from ovary, shorter than to about equal in length to the ovary at anthesis, connate at the base for a short distance (for *c.* 0.25 mm at anthesis), straight, slightly spreading, remaining straight with age; stigmas short, terminal. *Fruiting inflorescence* erect. *Capsules* obloid in outline, angled, moderately enlarged, not greatly exceeding perianth remains, not becoming inflated. (Figure 1)

Other specimens examined. WESTERN AUSTRALIA: [localities generalised for conservation reasons] Gum Creek, Mt Augustus Station, 22 Aug. 1986, *R.J. Chinnock* 6873 (AD); Thomas River, [Cobra Station], 27 July 1996, *A. Case & B. Cole* 58, (PERTH); Thomas River, 21 June 1999, *T.D. Macfarlane & R. Davis* TDM 3314 (PERTH); Thomas River, 29 June 2006, *T.D. Macfarlane, A.P. Brown & C.J. French* TDM 3891 (PERTH).

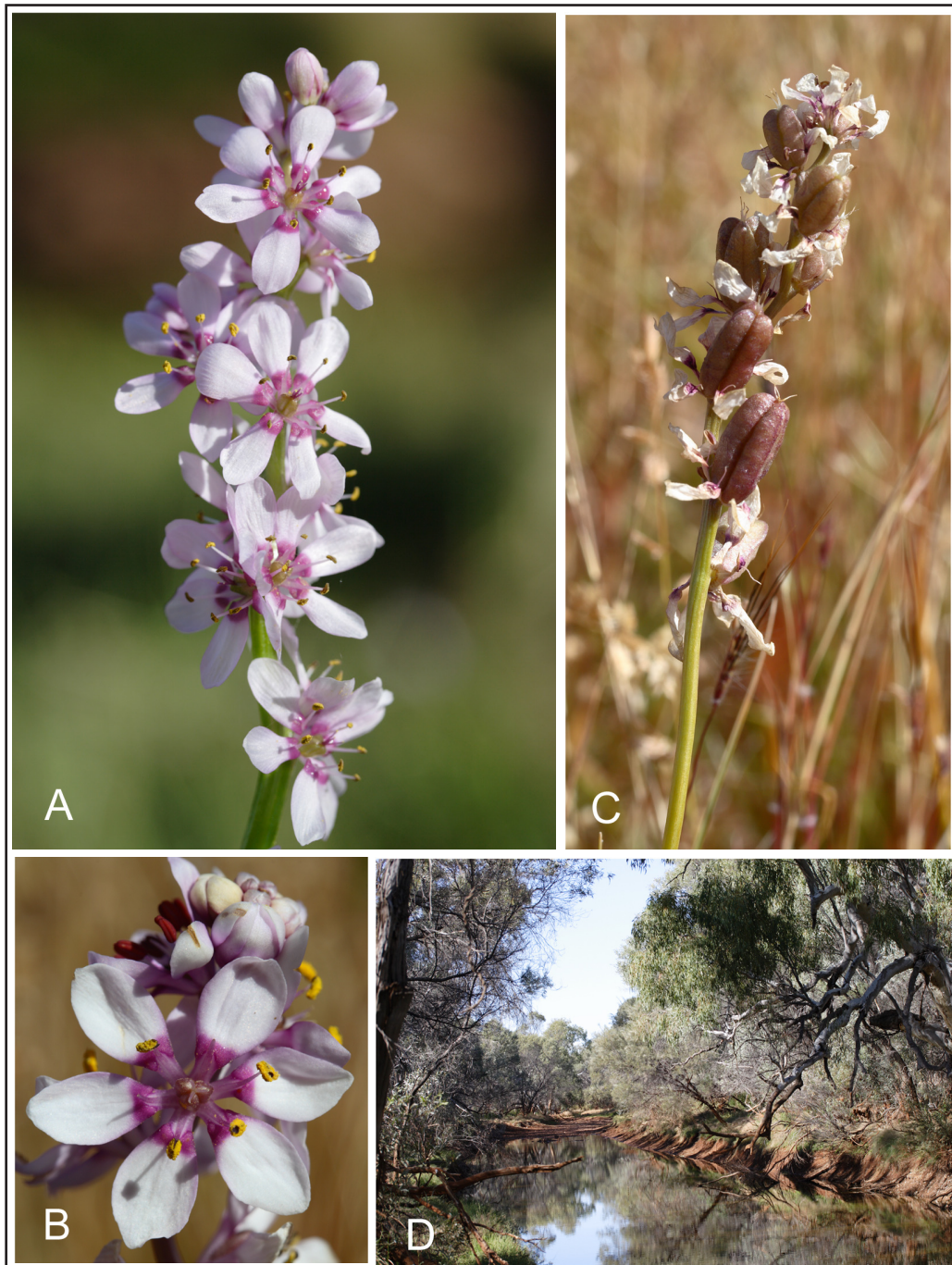


Figure 1. *Wurmbea fluviatilis*. A – flowering inflorescence; B – flower enlargement (some anthers lost); C – fruiting inflorescence; D – habitat, banks adjacent to river pool, Gum Creek. Photos: A, B, D – A.P. Brown. C – T.D. Macfarlane.

Distribution and habitat. Western Australia, Gascoyne IBRA Bioregion (Department of the Environment, Water, Heritage and the Arts 2010), known from only three locations, one each on the Thomas and Lyons rivers and Gum Creek (Figure 2). This represents a total range of 74 km. *Wurmbea fluviatilis* grows in damp soils of clay or sandy-clay on banks of river pools and river terrace pools, sometimes growing in water at the edges of shallow pools. Associated vegetation at Thomas River was a dense perennial grassland of *Eriachne* sp. with scattered trees of *Eucalyptus camaldulensis*, at Gum Creek a closed woodland of *E. camaldulensis* and *Acacia* spp. with a dense ground layer of mainly grasses and sedges and at Lyons River scattered *Eucalyptus camaldulensis* and *Acacia* spp. over sedges and annuals. The sites are beside seasonal watercourses and become flooded during wet periods with water persisting in the pools for an extended period.

Phenology. Flowers in June to August of years when there has been sufficient rainfall.

Conservation status. Listed as Priority Two under the Department of Environment and Conservation (DEC) Conservation Codes for Western Australia under the phrase name *Wurmbea* sp. Thomas River A. Case & B. Cole 58 (Smith 2010; Western Australian Herbarium, *FloraBase*, 1998–, accessed Nov. 2010). Only three localities are known despite some effort in seeking further localities, although only sites easily accessible by road have been examined to date. Whilst other locations may well exist, the

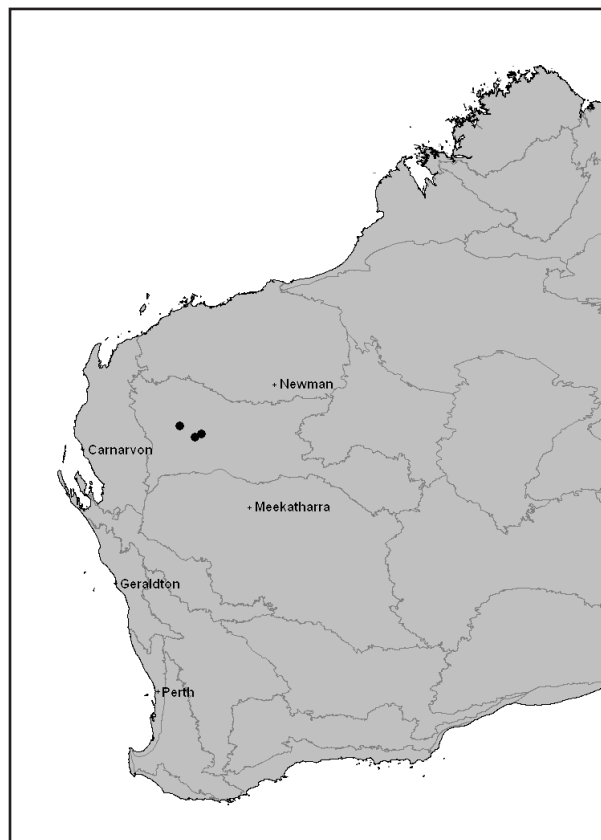


Figure 2. Map of Western Australia showing the distribution of *Wurmbea fluviatilis* and IBRA Bioregion boundaries.

species is clearly not distributed continuously along the watercourses, and it is vulnerable to threats such as weed invasion or potential heavy cattle use of river pools. However the Thomas River site is on land managed for conservation by DEC and the Gum Creek site is in good condition even though on a pastoral station; there is no detailed information for the Lyons River site.

Etymology. The specific epithet *fluviatilis* is from a Latin adjective meaning pertaining to rivers, in reference to the riverside habitat of this species.

Notes. *Wurmbea fluviatilis* is most similar to *W. monantha* (Endl.) T.Macfarlane in the form of the nectaries and their contrasting colour with the majority of the perianth, in the staminal filaments adnate to the tepal claw almost to the nectary and well beyond the fused part of the perianth, and in the style bases close together and usually shortly connate. They are both multi-flowered plants with hermaphrodite flowers and an erect fruiting peduncle. They differ in distribution, *W. monantha* being mainly coastal, especially favouring calcareous soils, and absent from the Gascoyne region; in habitat, *W. monantha* sometimes growing in damp situations but more often in drier sites whereas *W. fluviatilis* is associated with river banks and pools; and morphology, with *W. fluviatilis* usually having more flowers per plant and the perianth being a deeper pink in the centre with the colour not restricted to the nectary as it is in *W. monantha*.

Wurmbea fluviatilis plants are sometimes growing in water while flowering. This taxon is one of several which grow in water, including *W. murchisoniana* T. Macfarlane, *W. sp.* Cranbrook (A.R. Annels 3819) and the South Australian and Victorian *W. dioica* (R.Br.) F.Muell. subsp. *lacunaria* R.Bates (Bates 1995). None of these have the rigid curved nectary moulded around the filament as in *W. fluviatilis*.

No other *Wurmbea* species have been seen growing with *W. fluviatilis* although *W. inflata* grows in the same region, albeit in the very different habitat of rock scree on hillsides, and with its overall pink flowers, two separate, obscure, concolorous nectaries and often decumbent infructescences with inflated fruits, its morphology is very different (Macfarlane & Case 2007).

Acknowledgements

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References

- Barrett, S.C.H. & Case, A.L. (2006). The ecology and evolution of gender strategies in plants: the example of Australian *Wurmbea* (Colchicaceae). *Australian Journal of Botany* 54: 417–433.
- Bates, R.J. (1995). The species of *Wurmbea* (Liliaceae) in South Australia. *Journal of the Adelaide Botanic Gardens* 16: 33–53.

- Bates, R.J. (2007). A review of South Australian *Wurmbea* (Colchicaceae~Liliaceae): keys, new taxa and combinations, and notes. *Journal of the Adelaide Botanic Gardens* 21: 75–81.
- Case, A.L. & Barrett, S.C.H. (2004). Floral biology of gender monomorphism and dimorphism in *Wurmbea dioica* (Colchicaceae) in Western Australia. *International Journal of Plant Sciences* 165: 289–301.
- Case, A.L., Graham, S.W., Macfarlane, T.D., and Barrett, S.C.H. (2008). A phylogenetic study of evolutionary transitions in sexual systems in Australasian *Wurmbea* (Colchicaceae). *International Journal of Plant Sciences* 169: 141–156.
- Department of the Environment, Water, Heritage and the Arts (2010). Australia's bioregions (IBRA). <http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/index.html#ibra> [accessed Feb. 2011]
- Macfarlane, T.D. (1980). A revision of *Wurmbea* (Liliaceae) in Australia. *Brunonia* 3: 145–208.
- Macfarlane, T.D. (1987). *Wurmbea*. In: George, A.S. (ed.). *Flora of Australia*. Vol. 45. (Australian Government Publishing Service: Canberra.)
- Macfarlane, T.D. & Case, A.L. (2007). *Wurmbea inflata* (Colchicaceae), a new species from the Gascoyne region of Western Australia. *Nuytsia* 17: 223–228.
- Smith, M.G. (2010). Declared Rare and Priority flora List for Western Australia. (Department of Environment and Conservation: Kensington, WA.
- Western Australian Herbarium. (1998–). *FloraBase – The Western Australian flora*. Department of Environment and Conservation. <http://florabase.dec.wa.gov.au/> [accessed Feb. 2011]