

***Wurmbea flavanthera* (Yellow-anthered *Wurmbea*, Colchicaceae),
a new species from Western Australia's Mid West region**

Terry D. Macfarlane¹, Andrew P. Brown and Christopher J. French

Western Australian Herbarium, Biodiversity and Conservation Science,
Department of Biodiversity, Conservation and Attractions,
Locked Bag 104, Bentley Delivery Centre, Western Australia 6983
¹Corresponding author, email: Terry.Macfarlane@dbca.wa.gov.au

SHORT COMMUNICATION

Wurmbea densiflora (Benth.) T.Macfarlane (Colchicaceae) is an attractive, small geophyte bearing several pink flowers, occurring in the northern Wheatbelt and adjacent rangelands of Western Australia. However, the species concept used in a revision of *Wurmbea* Thunb. in Australia (Macfarlane 1980, 1987) proves to be a mixture of two species, *W. densiflora* in the original sense of Bentham (1878) and a later-flowering, undescribed species. This second species was given the phrase name *W. sp.* Paynes Find (C.J. French 1237), by which it has been known for some time (Western Australian Herbarium 1998–). The new species, having been well-researched in the field and Herbarium, is formally described below. The previous confusion between the two species was partly due to a lack of field knowledge and an inadequate appreciation of the relatively constrained flowering times of *Wurmbea* species.

Wurmbea flavanthera* T.Macfarlane, A.P.Br. & C.J.French, *sp. nov.

Type: 11.8 km north of Jose Street, Mullewa, on Carnarvon – Mullewa Road, west of road on a minor track, Western Australia, 17 August 2011, *T.D. Macfarlane, C.J. French & G.B. Brockman* TDM 5410 (*holo:* PERTH 09083596; *iso:* AD, CANB, K, MEL).

Wurmbea sp. Paynes Find (C.J. French 1237), Western Australian Herbarium, in *FloraBase*, <https://florabase.dpaw.wa.gov.au/> [accessed 10 September 2019].

Plants 80–225 mm tall. *Corm* ellipsoid, 10–15 mm long. *Leaves* 3, dissimilar to each other, separated along the stem, the lower 2 closer together than the middle and upper ones to each other. *Lowest leaf* attached at or slightly above ground level, erect or a little divergent, straight or occasionally arched, 1/2–3/4 as long as the plant height, lower than or occasionally reaching the lowest flower, lamina ± linear, 60–130 × 2–3 mm, tapering, base broad but not or only a little dilated, 2–6 mm wide, concave. *Middle leaf* separated from lowest by 10–35 mm, reaching from well below inflorescence to the lowest flower, erect or a little divergent, lamina broadly linear, 45–130 mm long, tapering, dilated at base and narrowing rather gradually into remainder of the lamina. *Upper leaf* separated from the second leaf by 20–80 mm, much shorter than lower 2 leaves, erect, 12–45 mm long, strongly dilated in basal part, narrowing abruptly into a tapering narrow apical part which is shorter than or up to 3 × as long as the dilated part, reaching well-below the inflorescence or to the lowest flower. *Peduncle* (exposed

stem between upper leaf and lowest flower) well-developed, 10–50 mm long. *Inflorescence* an open spike of (1–)2–8 flowers. *Flowers* all hermaphrodite or sometimes uppermost one reduced and male; scent not sweet. *Perianth* uniformly pale or dark pink, spreading to slightly reflexed so that the flower is open and disk-like (rotate or stellate). *Tepals* 6, (5.0–)6.0–9.4 mm long, connate very shortly at the base for 0.5–0.8 mm (<1/10 of their length), elliptic to narrowly oblong, obtuse, evenly thin-textured. *Nectaries* lacking. *Stamens* 6, conspicuous, $\pm 1/2$ as long as tepals; *filaments* relatively stout toward base although not dilated, tapering evenly, pink; *anthers* oblong, 1.8–2.8 mm long, versatile, attached at about 1/3 from the base of the connective, yellow. *Ovary* oblong in outline, 3-locular, reddish green to green, carpel wings free, contiguous, axis connate to top; *ovules* 20–34 per locule. *Styles* sharply delimited from the ovary, slightly shorter than to as long as ovary, pink or white, connate in lower 1/2–2/3, the free distal parts erect, spreading a little; *stigmas* minute, terminal. *Fruiting plants* erect. (Figure 1)

Diagnostic features. *Wurmbea flavanthera* is unique among Australian *Wurmbea* in lacking nectaries on the perianth. All other species have nectaries, although in some they may be inconspicuous or hidden. In addition, it is distinguished from other members of the genus by the combination of leaves all separated, rotate or stellate flowers with a uniformly pink, thin-textured perianth, conspicuous yellow anthers, and relatively short styles that are no longer than the ovary at anthesis and connate to the middle or higher. The plants remain erect in fruit.

Selected specimens examined. WESTERN AUSTRALIA: 1–2 miles [1.6–3.2 km] N of Carnamah along Geraldton Hwy [The Midlands Rd], 4 Sep. 1958, *T.E.H. Aplin* 35 (PERTH); Paynes Find 41 km meridionale versus [towards S], 10 Aug. 1963, *J.S. Beard* 2632 (PERTH); Yalgoo, between Mullewa and Mount Magnet, 22 Aug. 1931, *W.E. Blackall & C.A. Gardner* WEB 492 (PERTH); Breakaway Bore, c. 50 km S of Paynes Find, 7 Sep. 1999, *A.P. Brown* 3653 (PERTH); Charles Darwin Reserve, c. 200 m W of old White Wells HS building, 17 Aug. 2007, *M.G. Corrick* 11608 (MEL *n.v.*, PERTH); 1.5 km N along Wubin/Mullewa road from Nanekine Rd, 200 m E, 11 Sep. 2007, *R. Davis* 11249 (PERTH); 8 miles [12.9 km] N Kadji Kadji, 18 Aug. 1983, *H. Demarz* 9627 (PERTH); Karara Station, 10 Sep. 1999, *K.J. Fitzgerald et al.* KJF 296 (CANB *n.v.*, PERTH); 53.6 km N of Paynes Find on Paynes Find–Mt Magnet Rd, 17 Sep. 1998, *C.J. French* 1237 (CANB *n.v.*, MEL *n.v.*, PERTH); 6 miles [9.7 km] E of Mullewa, 9 Sep. 1966, *A.S. George* 7951 (PERTH); Great Northern Hwy, Yalgoo, c. 71 km NE from Wubin, 12 Sep. 2016, *F. Hort & J. Hort* FH 4050 (PERTH); on S side of Lookout Rd, 1.3 km N of the actual lookout, Coalseam Conservation Park, c. 26 km SW of Tardun, 13 Aug. 1999, *G.J. Keighery & N. Gibson* 5986 (PERTH); Great Northern Hwy, 10.8 km S of Yalgoo–Ninghan Rd, 13 Aug. 2011, *T.D. Macfarlane, C.J. French & G.B. Brockman* TDM 5387 (AD, BRI, CANB, K, MEL, NSW, PERTH); Blue Hills Range, Windaning Hill, survey site WIND 12, on Karara Station c. 6.5 km NNE of Mulga Bore and 77 km W of Paynes Find, 17 Sep. 2005, *A. Markey & S. Dillon* 3797 (PERTH); c. 17.4 km NE of Yalgoo, Wadgingarra survey site WADG16, on Muralgarra Station c. 2.3 km SW of Cattle Well and 5 km NW of Wadgingarra Well (Carlaminda), 31 Aug. 2007, *A. Markey & S. Dillon* 5426 (PERTH); Extension Hill, survey site MTGB 01, c. 1.5 km N along ridge from Extension Hill spot-height 444 m, 12 Sep. 2005, *R. Meissner & Y. Caruso* 233 (PERTH); Tallering Peak, at the gorge, 5 Sep. 2003, *S. Patrick et al.* 4846 (PERTH); 6.8 miles [10.9 km] NE of Three Springs on Morawa road, 10 Sep. 1978, *M.E. Trudgen* 2205 (PERTH).

Phenology. Flowering late July–September. Fruiting September–October.



Figure 1. *Wurmbea flavanthera*. A – habit, showing the three separated leaves; B – inflorescences; C – fruiting plant with erect fruiting stem; D – flowers, showing the flat to somewhat reflexed tepals, flat tepal bases, yellow anthers and fused styles; E – population of plants intermixed with yellow and white Asteraceae species. Images from T.D. Macfarlane, C.J. French & G.B. Brockman TDM 5387 (A, D), T.D. Macfarlane, C.J. French & G.B. Brockman TDM 5410 (type collection) (B, E) and T.D. Macfarlane 4740 (C), with vouchers at PERTH. Photographs by G.B. Brockman (A, D), C.J. French (B, E) and T.D. Macfarlane (C).

Distribution and habitat. *Wurmbea flavanthera* occupies an area in the Mid West region of southwestern Australia between Carnamah, Paynes Find, Yalgoo and Mullewa. It is embedded within the western part of the much more extensive range of *W. densiflora* (Western Australian Herbarium 1998–). It grows in a range of habitats in tall shrubland or woodland mostly dominated by species of *Acacia*. The species is particularly common in seasonally wet areas on rocky hills, rock outcrops, breakaways and along water courses in red or brown clay or sandy clay soils. It frequently occurs in large, dense populations, the pink masses of the *Wurmbea* often intermixed with yellow and white annual species of Asteraceae (everlastings).

Conservation status. *Wurmbea flavanthera* is a common and widespread species that is not of conservation concern.

Etymology. The epithet is a compound of the Latin *flavus* (yellow) and *anthera* (anther), in reference to the conspicuous yellow anthers of this species, an unusual feature in a genus where most Australian species have dark red anthers.

Common name. Yellow-anthered Wurmbea.

Affinities. The species most similar to *W. flavanthera* (Figure 1) is *W. densiflora* (Figure 2), with which it has been confused. While they are generally similar in size and in bearing several pink flowers, and have an overlapping distribution, there are a number of clear differences between them. *Wurmbea flavanthera* has the leaves separated from one another along the stem (vs two together at the base and one higher); flowers usually separated (vs crowded); widely spreading or somewhat reflexed tepals that are straight and flat throughout their length so that the flower is rotate or stellate (vs campanulate with tepals forming a tubular or cup-shaped structure before curving outwards, the basal part of the tepals forming a channel or groove under the staminal filament); tepals lacking nectaries (vs nectaries present, although concealed at the base of the tepals and poorly differentiated); anthers yellow prior to dehiscence (vs dark red); styles that are no longer than the ovary and connate for 1/2–2/3 their length (vs longer than the ovary and connate for less than 1/2 their length); and an erect fruiting stem (not decumbent). Furthermore, the two species have well-separated flowering times, with *W. flavanthera* blooming in late winter to spring (late July–September) and *W. densiflora* in autumn to early winter (April–June).

Another species with a dense inflorescence of pink flowers and yellow, reddish yellow or red anthers prior to dehiscence is *W. saccata* T.Macfarlane & S.J.van Leeuwen (Macfarlane & van Leeuwen 1996) but this species differs from *W. flavanthera* in having a campanulate flower, tepals each with a saccate base containing a basal nectary, styles that are longer than the ovary and connate up to 1/3 their length, and a much more northerly distribution.

Notes. The following PERTH specimens cited under *W. densiflora* in Macfarlane (1980, 1987) are *W. flavanthera*: *Aplin* 35, *Beard* 2632, *Blackall & Gardner s.n.* (now numbered WEB 492: PERTH 01999613), *Brooker* 1992, *George* 7951, *McCrumm s.n.* (PERTH 01999540), *Trudgen* 2205.

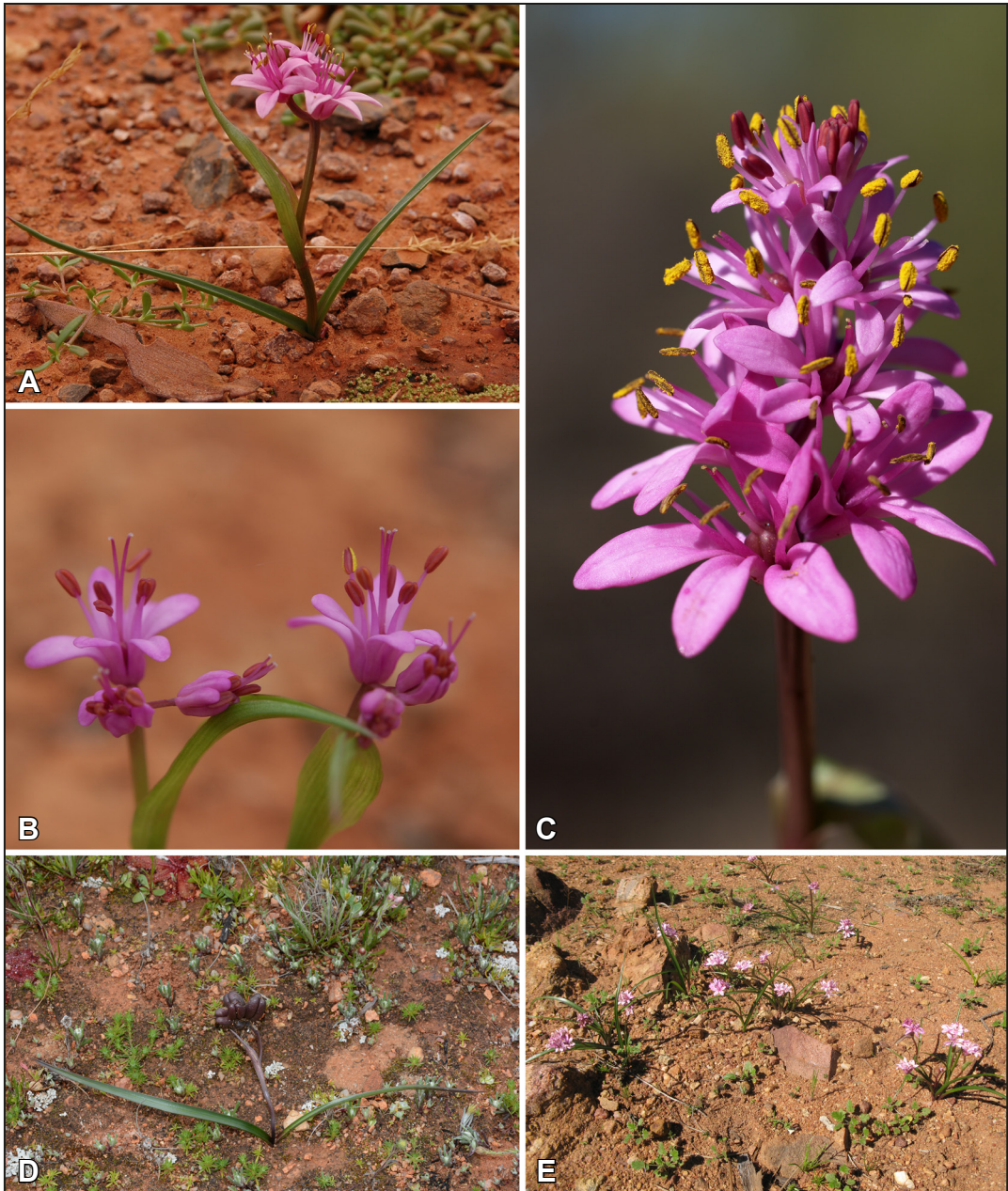


Figure 2. *Wurmbea densiflora*. A – habit, showing two leaves at base and one higher; B – flowers, showing campanulate shape, red anthers and long styles; C – inflorescence, showing crowded flowers, tepals with groove toward base under staminal filament, anthers red before dehiscence; D – fruiting plant with decumbent fruiting stem; E – habitat and population of plants. Images from T.D. Macfarlane, A.P. Brown, C.J. French & G.B. Brockman TDM 5273 (A), C.J. French CJF 8940 (B), A.P. Brown, Galena School site (C), C.J. French CJF 10183 (D) and C.J. French CJF 7083 (E), with vouchers at PERTH. Photographs by G.B. Brockman (A), C.J. French (B, D, E) and A.P. Brown (C).

Acknowledgements

Thanks to Garry Brockman for his participation in field work, discussions on *Wurmbea* and for freely sharing his photos.

References

- Bentham, G. (1878). *Flora Australiensis*. Vol. 7. (Reeve and Co.: London.)
- 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. & van Leeuwen, S.J. (1996). *Wurmbea saccata* (Colchicaceae), a lepidopteran-pollinated new species from Western Australia. *Nyctisia* 10: 429–435.
- Western Australian Herbarium (1998–). *FloraBase—the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions. <https://florabase.dpaw.wa.gov.au/> [accessed 22 November 2019].