

**Leeuwen's Lily (*Arthropodium vanleeuwenii*: Asparagaceae),  
a remarkable new discovery from the Pilbara,  
Western Australia**

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**SHORT COMMUNICATION**

During a flora survey in Western Australia's Pilbara bioregion in 2016, a new species of *Arthropodium* R.Br. was discovered by botanical consultants Jerome Bull and Jessica Waters. This was a surprising find since it is the first record of *Arthropodium* s. lat. for the Pilbara biological region, with *Thysanotus* R.Br. being the only other genus in Asparagaceae recorded from the area. It is also a significant range extension for the genus, occurring some 540 km east-north-east of the nearest record in the Carnarvon bioregion (Western Australian Herbarium 1998–). This new species is named for Dr Stephen van Leeuwen in recognition of his extensive contribution to the understanding, conservation and appreciation of Western Australia's biodiversity, especially the flora of the Pilbara.

***Arthropodium vanleeuwenii* S.J.Dillon, sp. nov.**

*Type:* Karijini National Park, Western Australia [precise locality withheld for conservation reasons], 27 September 2018, S. Dillon & J. Naaykens SD 7106 (*holo:* PERTH 09084665; *iso:* MEL).

*Arthropodium* sp. Ironstone (J. Bull & J. Waters ONS PJ 36.01), Western Australian Herbarium, in *FloraBase*, <https://florabase.dpaw.wa.gov.au/> [accessed 14 October 2019].

*Perennial herb* to 70 cm high. *Tubers* sessile, narrowly ovoid to narrowly ellipsoid, 9–33 mm long, 5–9 mm wide, white becoming brown with age, with a sparse indumentum of simple to branched, crisped hairs to 0.3 mm long. *Leaves* apparently few, present up to and during early flowering, withering and often caducous prior to the completion of flowering, 175–285 mm long, 2.8–4.5 mm wide, surface glabrous, margin glabrous or with evenly-spaced, patent hairs to 0.125 mm long. *Inflorescence* an erect raceme or a 2- or 3-branched panicle with a terete axis, glabrous, dull purple to yellow-green, 160–930 mm long including scape with flowers in the upper 20–30% and spaced 8–12 mm apart. *Bracts* appressed to shallowly recurved, partly clasping the stem, narrowly ovate-triangular, 1.7–3.0 mm long at anthesis, membranous with 3(–13 on sterile bracts) brown veins. *Flowers* 1 per node, secund, opening successively from base to tip. *Pedicels* strongly recurved proximally so the remainder of the pedicel and the flower are pendulous, (4.0–)4.9–8.5 mm long at anthesis, (2.8–)4.2–6.5 mm below the abscission point, (1.2–)1.8–2.3 mm above, expanding evenly above the abscission point to the

receptacle. *Sepals* spreading to slightly recurved, narrowly oblong-elliptic, (5.5–)6.5–9.1 mm long, 2.1–2.9 mm wide, mauve, paler towards the centre with 3 mauve (drying buff) nerves, apiculus 0.3–0.5 mm long with a small tuft of tepal apex trichomes at the base. *Petals* spreading to slightly recurved, elliptic, 6.0–8.9 mm long, 3.9–4.9 mm wide, purple to mauve, paler towards the centre with 3 mauve (drying buff) nerves, apex rounded to emarginate; margin erose, undulate. *Stamens* erect or spreading to 45°; filaments yellow, flattened, strongly geniculate but becoming straighter with maturity, (2.0–)3.0–3.5 mm long; anthers basifixed, 3.3–4.6 mm long, purple and minutely retrorsely scabrid in proximal 3/4, paler and smoother distally; appendages 2, 0.5–1.6 mm long, papillose, maroon when fresh but drying dark purple to almost black, fused to the base of the anther and adnate for *c.* 1/3 of its length to the filament, free portion shallowly recurved. *Style* purple, slightly curved, 3.6–4.9 mm long; stigma minute with pink to white papillae. *Ovary* pale yellow, spherical, 1.2–1.5 mm diam., placentation axile with 6–8 ovules per locule in 2 rows of 3 or 4. *Capsule* yellow-green, spherical to depressed-obovoid with 3 lobes, chartaceous, 3.5–5.3 mm diam., loculicidal, perianth deciduous from near the base leaving a short, ragged fringe of perianth parts. *Seeds* ± spherical, rounded abaxially with faint, irregular ridges, adaxial surface with irregular folds, black, 1.35–1.7 mm diam., testa papillose with 1 papilla per cell; papillae circular to elliptic, flat-topped with a rimmed perimeter, sides smooth. (Figures 1, 2)

*Diagnostic features.* *Arthropodium vanleeuwenii* can be distinguished from other species of *Arthropodium s. lat.* (including *Dichopogon* Kunth, see *Affinities*) by the following combination of characters: sessile tubers; a second inflorescence with one pendulous flower per node; geniculate, glabrous staminal filaments; purple, minutely scabrid anthers with two papillose appendages; and seed to 1.7 mm diam., papillose, the papillae with smooth sides.

*Other specimens examined.* WESTERN AUSTRALIA: [localities withheld for conservation reasons] 17 Sep. 2016, *J. Bull & J. Waters* ONS PH 01.04 (PERTH); 17 Sep. 2016, *J. Bull & J. Waters* ONS PJ 36.01 (PERTH); 14 Oct. 2017, *S. Dillon & J. Bull* SD 7100 (PERTH); 14 Oct. 2017, *S. Dillon & J. Bull* SD 7101 (PERTH); 14 Oct. 2017, *S. Dillon & J. Bull* SD 7103 (PERTH).

*Phenology.* Flowering from mid- to late September. Fruiting from late September to mid-October.

*Distribution and habitat.* Known from two small populations growing above 900 m on south-facing hillslopes of Brockman Iron Formation in the Pilbara bioregion of Western Australia. Associated vegetation includes *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana*, *Indigofera fractiflexa*, *Triodia* spp. and *Themeda triandra*. Often found growing under the *Triodia* and occasionally under the *Themeda*, very rarely growing in the open.

*Conservation status.* *Arthropodium vanleeuwenii* is listed as Priority Two under Conservation Codes for Western Australian Flora (Smith & Jones 2018), under the name *A. sp.* Ironstone (*J. Bull & J. Waters* ONS PJ 36.01). One population, in which *c.* 75 individuals were observed, is located within Karijini National Park. The other population is on Unallocated Crown Land, which is also covered by mining tenement, in which few individuals were observed. Targeted surveys to establish the population size and range of *A. vanleeuwenii* have yet to be undertaken.

*Etymology.* Honours Dr Stephen J. van Leeuwen (1962–) for his exceptional efforts over many years to expand our understanding of the Pilbara flora, both on the ground and in support and guidance of others. His broad knowledge, generosity, and great sense of humour have been an inspiration to many.



Figure 1. *Arthropodium vanleeuwenii*. A – habitat on slopes of Brockman Iron Formation; B – racemose inflorescence with a single open flower; C – flower, showing the erose petals; D – flower, showing the yellow filaments and purple anthers with maroon appendages. Photographs by S.J. Dillon from S. Dillon & J. Naaykens 7106 (B–D).

*Vernacular name.* Leeuwen's Lily.

*Affinities.* Although *Arthropodium* and *Dichopogon* were treated as distinct genera in *Flora of Australia* (Brittan 1987a, 1987b), subsequent studies support the recognition of a single genus (Stringer & Conran 1991; Westphalen & Conran 1994). Four species of *Dichopogon* remain accepted in Western Australia (Western Australian Herbarium 1998–) pending formal publication of their transfer to *Arthropodium*



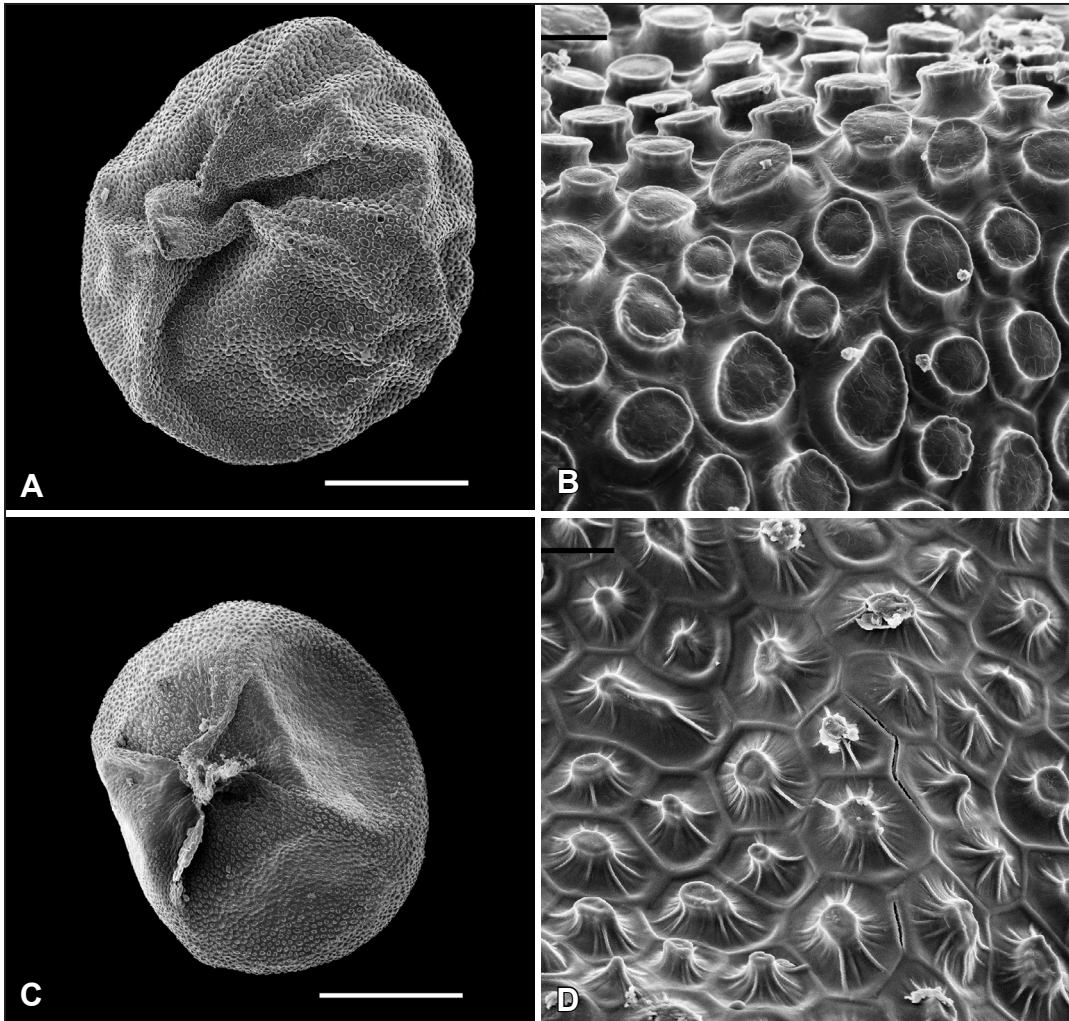


Figure 2. Comparison of the seeds of *Arthropodium vanleeuwenii* and *Dichopogon preissii*. A – seed of *A. vanleeuwenii*; B – seed surface detail of *A. vanleeuwenii* showing the prominent testa papillae with smooth sides; C – seed of *D. preissii*; D – seed surface detail of *D. preissii* showing the smaller testa papillae with striate sides. Scale bars = 0.5 mm (A, C); 20  $\mu$ m (B, D). Photographs by S.J. Dillon from S. Dillon & J. Bull SD 7101 (A, B), G.J. Keighery 14641 (C) and A. Markey 1067 (D).

(Macfarlane and Conran, in prep.), including the provision of a new combination for *D. tyleri* Brittan. We place the new species in *Arthropodium* in order to avoid an unnecessary additional combination.

*Arthropodium vanleeuwenii* is morphologically most similar to the south-western Australian endemic *D. preissii* (Endl.) Brittan, a species that also has sessile tubers, a second inflorescence and anthers with two appendages. It can be distinguished from *D. preissii* by its inflorescence, which is a raceme or occasionally a 2- or 3-branched panicle (*cf.* usually a 2–8-branched panicle, rarely a raceme) with shorter pedicels at anthesis (4.9–8.5 mm long *cf.* 8.6–15.7 mm). It also has sepals with a shorter apiculus (0.3–0.5 mm long *cf.* 0.8–1.2 mm long), and its seeds are larger (1.35–1.7 mm diam. *cf.* 1–1.3 mm diam.) with testa papillae that are larger and lack distinctly striate sides (compare Figure 2B and 2D).

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