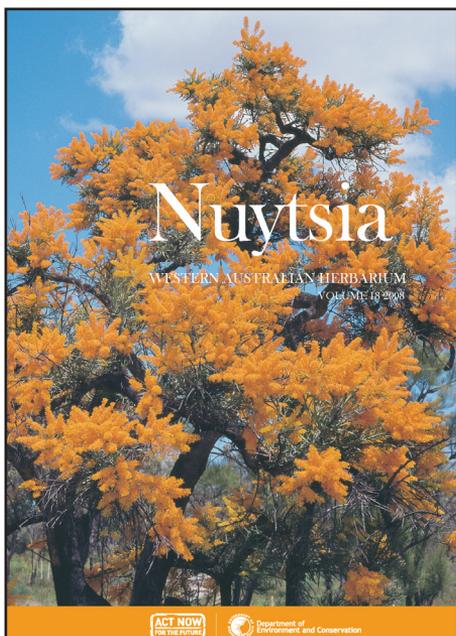


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## ***Stylidium perplexum* (Stylidiaceae): a remarkable new triggerplant from south-west Western Australia**

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### **Abstract**

Wege, J.A. *Stylidium perplexum* (Stylidiaceae): a remarkable new triggerplant from south-west Western Australia. *Nuytsia* 18: 285–289 (2008). *Stylidium perplexum* Wege is newly described and photographs and a distribution map provided. This distinctive triggerplant has a tuberous, multi-stemmed and somewhat shrubby habit, discoid glandular trichomes restricted to the pedicels and hypanthia, linear leaves to 2 cm long, an elliptic hypanthium, narrow calyx lobes, and white to purplish laterally-paired corolla lobes bearing eight purple-tipped throat appendages. It occurs within a Conservation Park south-east of Dardanup and is listed as having conservation priority in Western Australia.

### **Introduction**

*Stylidium perplexum* Wege (Stylidiaceae) was first collected by Graham S. McCutcheon in 1983 from near Dardanup in Western Australia. His specimen, erroneously identified as *S. fasciculatum* R.Br., remained embedded in the collection at the Western Australian Herbarium (PERTH) until recently discovered as part of ongoing taxonomic assessment of the State's triggerplant holdings. Although fragmentary—comprising an elongated, leafy stem portion and flowering scape rather than an entire plant—it could readily be referred to *S.* subgenus *Tolypangium* (Endl.) Mildbr. section *Saxifragoidea* Mildbr. on the basis of trichome and flower morphology; however, it could not be referred to any known species within this group and its precise growth form was unknown.

McCutcheon's collection site was successfully relocated in early November 2007, at which time *S. perplexum* was only just coming into flower. It was found to be a shrubby to sprawling perennial with a sizeable stem tuber. Remarkably, some individuals were observed to possess in excess of 200 leafy stems arising from the tuber. In view of its conspicuous habit and localised abundance, it is somewhat surprising that this triggerplant has, until recently, remained unknown to science.

### **Methods**

The species description is based upon field observations and the examination of herbarium specimens, photographs and flowers preserved in 70% ethanol. The distribution map was compiled using DIVA-GIS freeware Version 5.2.0.2. Precise locality information has been withheld in view of this species rarity.

## Taxonomy

### *Stylidium perplexum* Wege, *sp. nov.*

Ab speciebus *Stylidii* aliis omnibus turma sequenti characterum distinguitur: caulis tuber magnum, irregulare; caules numerosi, foliiferi, ramificantes ad nodos; trichomata glandulosae, discoidea; folia lineares; hypanthium ellipticum.

*Typus*: south-east of Dardanup, Western Australia [precise locality withheld for conservation purposes], 29 November 2007, *J.A. Wege, K.R. Thiele & A.J. Stumpf* JAW 1508 (*holo*: PERTH 07719922; *iso*: BRI, CANB, MEL).

*Stylidium* sp. Dardanup (G.S. McCutcheon GSM 1066), Western Australian Herbarium, in FloraBase, <http://florabase.dec.wa.gov.au> [accessed 10 January 2008].

*Domed or sprawling shrublet* 15–40 cm high. *Trichomes* glandular, 0.1–0.15 mm long, stalks translucent, heads black, discoid; eglandular trichomes absent. *Stems* elongate, arising from an irregular tuber, numerous (200+) in mature plants, branching at nodes to form a tangled network, occasionally rooting at nodes; internodes (1.5–)4–16 mm long, 0.6–1.2 mm wide, glabrous; new shoots straw-coloured, leafy, longitudinally-ridged; older internodes reddish-brown, smooth, becoming leafless; stilt roots absent. *Leaves* rosetted at stem apex, scattered beneath, linear, apex acute, margin entire, 0.5–2.5 cm long, 0.6–1.2 mm wide, glabrous. *Scapes* 8–19 cm high, 0.5–0.8 mm wide, glabrous. *Inflorescence* 6–14-flowered, paniculate or racemiform; units 1.5–2.2 cm long, 1–3-flowered; bracts subulate, 2–4.5 mm long, apex acute, margin entire, glabrous; bracteoles similar but smaller; pedicels to 8 mm long, glandular. *Hypanthium* ellipsoid, slightly compressed in T.S., 2.8–5 mm long, 1.2–2 mm wide, sparingly glandular. *Calyx lobes* free, apex acute, margin entire, inconspicuously gibbous at base, 2.5–4 mm long, 0.5–0.7 mm wide, glabrous. *Corolla* tube 1–1.2 mm long; lobes white, often blushed purple, laterally-paired, elliptic to narrowly ovate, 4–6 mm long, 2.2–3.6 mm wide, abaxial surface glabrous. *Labellum* reflexed and twisted across calyx lobes, boss ovate, terminal appendage 0.5–1 mm long, lateral appendages absent or rudimentary. *Throat appendages* 8, white with purple papillose tips, oblong, ± capitate, 0.3–1.2 mm long. *Column* 10–14 mm long, glabrous; anther locules parallel relative to column axis, black, subtending hairs absent; stigma very shortly stalked, entire. *Capsules* ellipsoid to obloid, 4–7 mm long excluding calyx lobes. *Seed* brown-black, ellipsoid, 0.6–0.8 mm long, 0.4–0.5 mm wide. (Figures 1, 2)

*Other specimens examined*. WESTERN AUSTRALIA: [localities withheld] 7 Dec. 1983, *G.S. McCutcheon* GSM 1066 (PERTH); 7 Nov. 2007, *J.A. Wege & R. Butcher* JAW 1470 (AD, NSW, PERTH); 7 Nov. 2007, *J.A. Wege & R. Butcher* JAW 1471 (CANB, MEL); 25 Jan. 2008, *J.A. Wege & B.P. Miller* JAW 1509 (CANB, MEL, PERTH).

*Distribution and habitat*. *Stylidium perplexum* is known from remnant bushland on the Whicher Scarp south-east of Dardanup in Western Australia (Figure 1E) where it grows in lateritic soils. It is apparently confined to, but common within, a narrow altitudinal gradient on an upper ridge slope bearing *Eucalyptus marginata* and *Corymbia haematoxylon* woodland over *Banksia grandis* and *Xanthorrhoea*.

*Phenology*. Flowers have been recorded in November and December, with peak flowering in late November to early December.

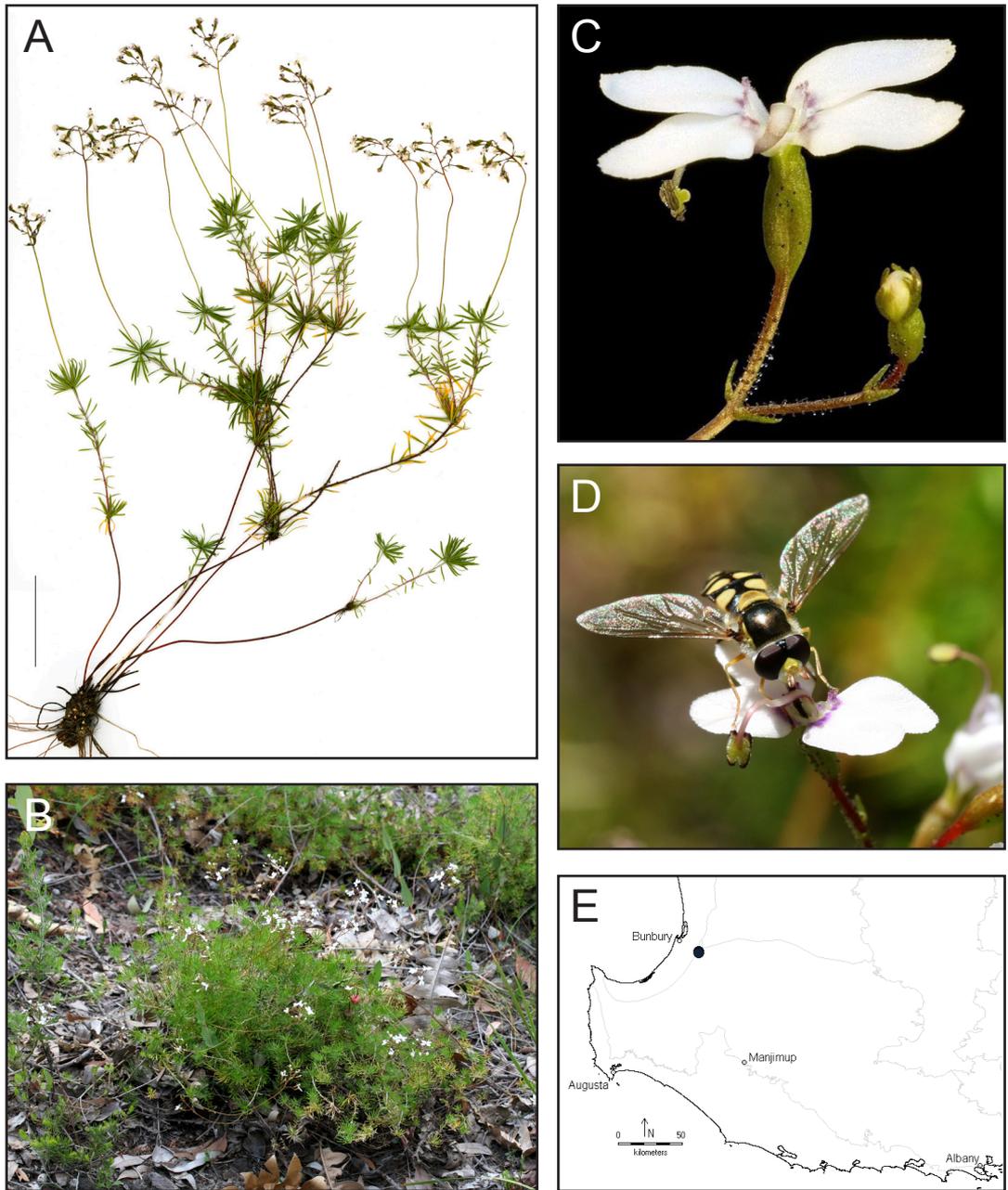


Figure 1. *Stylidium perplexum* (J.A. Wege, K.R. Thiele & A.J. Stumpfel JAW 1508). A – holotype, scale = 5 cm; B – habit; C – anterior view of flower showing the sparingly glandular hypanthium, lateral pairing of the corolla lobes and purple-tipped throat appendages. Note the labellum is obscured by the resting column and the stigma is developed; D – a triggered flower is visited by a syrphid fly; E – distribution in south-west Western Australia, with Version 6.1 IBRA regions (Department of the Environment, Water, Heritage and the Arts 2008) indicated in grey. Photographs by Juliet Wege (B, D) and Kevin Thiele (C).

*Conservation status.* *Stylidium perplexum* occurs within a Conservation Park of very high conservation value (Keighery *et al.* 2008), however, the known populations are adjacent to an active mineral sands mine and could be impacted by future mining activities. It is listed by Atkins (2008) as Priority One under Department of Environment and Conservation (DEC) Conservation Codes for Western Australian Flora, under the name *Stylidium* sp. Dardanup (G.S. McCutcheon GSM 1066). Further survey is required to ascertain population size and extent within the Conservation Park and to determine whether this conservation listing should be upgraded to Declared Rare Flora.

*Etymology.* The specific epithet is derived from the Latin *perplexus* (tangled, intricate) and refers to the prolific production of wiry stems that become entangled with one another as the plant matures. It also eludes to my bewilderment when I first laid eyes on McCutcheon's collection of this species.

*Spotting features.* *Stylidium perplexum* can be distinguished from other species in the genus by the following combination of characters: an irregular stem tuber from which numerous, elongated and leafy stems arise; discoid glandular hairs; linear leaves; and an elliptic hypanthium.

*Affinities.* *Stylidium perplexum* is morphologically similar to *S. pritzelianum* Mildbr., a forest-dwelling species restricted to the Walpole and Denmark regions in southern Western Australia. Both species have wiry, intricately tangled stems, discoid glandular trichomes restricted to the pedicels and hypanthia, elliptic hypanthia, narrow and acute calyx lobes that are slightly gibbous at the base, and laterally-paired flowers bearing eight throat appendages. Although their flowers are quite similar, these two species differ markedly in leaf morphology and arrangement, with *S. pritzelianum* possessing oblanceolate leaves arranged in discrete whorls. It can be further differentiated from *S. perplexum* by its deep purple corolla lobes, smaller hypanthium (1.5–2.5 mm long × 0.7–1.3 mm wide), shorter calyx lobes (1.3–2.6 mm long), and shorter column (4.7–5.5 mm long).

*Notes.* Sterile material of *S. perplexum* may be confused with *S. fasciculatum* R.Br. and *S. adnatum* R.Br. (*S.* subgenus *Tolypangium* section *Rhynchangium* Benth.). These two species also possess a stem tuber, a shrubby, multi-stemmed habit and straw-coloured new shoots. Unlike *S. perplexum*, *S. fasciculatum* and *S. adnatum* possess glandular trichomes with ellipsoid heads, denser, more floriferous inflorescences, cylindrical hypanthia that are conspicuously narrowed at the apex, and flowers without throat appendages.

The type locality of *S. perplexum* has not been burnt for at least 13 years (G. Keighery pers. comm.) which accounts for the large size of individual plants. In the event of a fire, plants are likely to resprout from the stem tuber in addition to recruiting from seed. Unusually, only a relatively small proportion of the stems in any one individual bore flowering scapes in 2007. Whilst this may be a seasonal response to below average rainfall, it may also be characteristic of the species. Ovule number (*c.* 10–25 per flower) is relatively low for species in the genus suggesting that, in view of its tuberous habit, *S. perplexum* invests less energy into seed production. There was also evidence of clonality within the population: the laterally-spreading stems of some individuals were observed to produce fleshy roots from lower nodes situated in close proximity to the ground (Figure 2). Fragmentation of the subtending internodes would lead to the establishment of a clonal individuals.

Syrphid flies were seen actively visiting and pollinating *S. perplexum* (Figure 1D). Small native bees were also common visitors, however, they were never observed to trigger the release of the column.

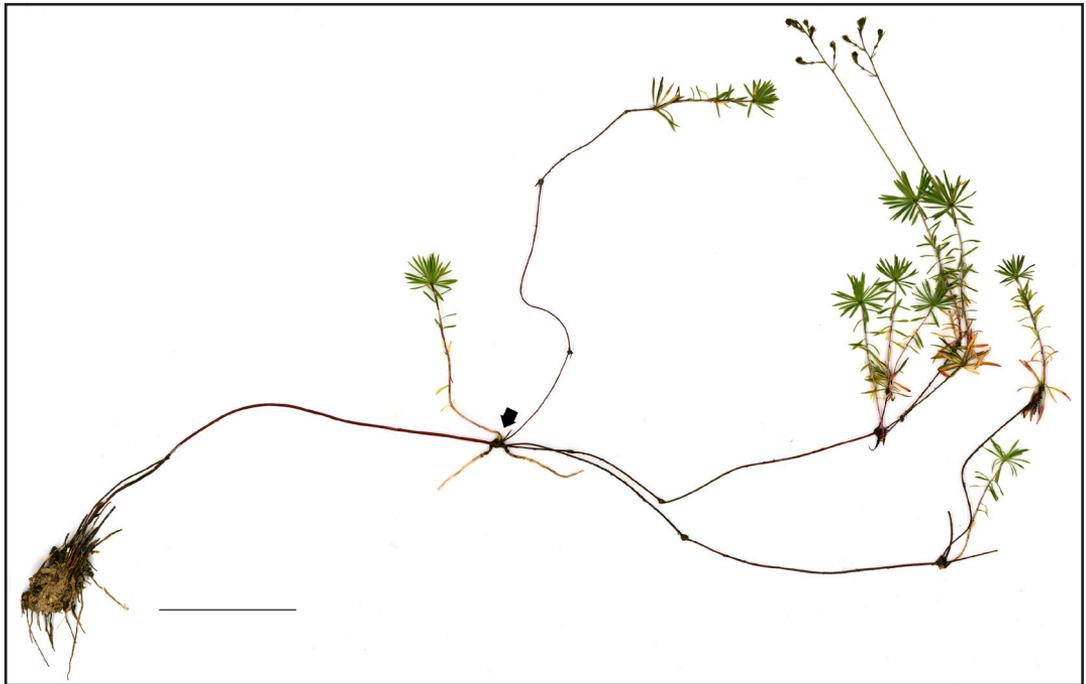


Figure 2. A laterally-spreading stem of *S. perplexum*, arising from the stem tuber. Fleshy roots have formed at the lower node (indicated with an arrow) which was in contact with the soil surface. A clonal plant would be created upon fragmentation of the stem below this node. From *J.A. Wege & R. Butcher JAW 1471*, scale = 5 cm.

### Acknowledgements

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