

Stylidium validum (Stylidiaceae): a new trigger plant from southern Western Australia

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Abstract

A new southern Western Australian endemic trigger plant, *Stylidium validum* Wege, is described as part of a broader taxonomic research project. *Stylidium validum* is characterised by a robust, caespitose habit, a tufted basal rosette of glaucous, oblanceolate leaves, a glabrous scape axis, an ellipsoid, glandular hypanthium, and laterally-paired corolla lobes that are white to pale pink-mauve with two sets of throat markings. This species has conservation priority since it is known from only three locations within the South-western Interzone, west of Norseman. Illustrations and a distribution map are provided.

Keywords: taxonomy, *Stylidium*, greenstone

Introduction

The trigger plant genus *Stylidium* (Stylidiaceae) comprises over 240 taxa characterised by a touch-sensitive floral column that places pollen on, or removes pollen from an insect's body. Approximately 70% of taxa are endemic to the south-west of Western Australia (Wagstaff & Wege 2002). Within this region, centres of species richness in the genus are higher close to the coast, especially in the high rainfall zone (Burbidge 1984). Far fewer species occur in the drier, South-western Interzone (or Coolgardie bioregion). Here, species of *Stylidium* are known from seepage zones adjacent to granite outcrops (e.g. *S. dielsianum* E. Pritz.), areas of sandplain (e.g. *S. choreanthum* F.L. Erickson & J.H. Willis, *S. limbatum* F.Muell., *S. arenicola* Carlquist) and adjacent to salt lakes systems (e.g. *S. pulviniforme* Lowrie & Kenneally).

Examination of the herbarium collection at The Western Australian Herbarium (PERTH) uncovered specimens of *Stylidium* from the South-western Interzone not referable to any known taxon. Subsequent field searches relocated this entity and confirmed it to be a distinct new species. A description, illustration and distribution map are provided herein. This research forms part of a wider treatment of *Stylidium* for the Flora of Australia.

Methods

This study is based on herbarium specimens housed at PERTH and The National Herbarium of Victoria (MEL), and on the field observations of the author. Morphological characters were coded using a combination of fresh, spirit and herbarium material. Corolla lobe measurements were based solely on material collected from the type locality (JAW 982) and preserved in 70% ethanol. Trichomes from the spirit collection were

cleared in domestic bleach and mounted in Apathy's Aqueous Mountant for examination under a compound microscope.

Data were recorded as a DELTA dataset (Dallwitz *et al.* 1993) from which a species description was generated. The distribution map was compiled using Online Map Creation (OMC) and is based on PERTH specimen data.

Taxonomy

Stylidium validum* Wege *sp. nov.

Species haec ab *Stylidio turleyae* Lowrie & Kenneally differt scapo glabero et glauco, foliis ad 6 mm latis, pagina abaxiali corollae immaculata.

Typus: Forrestiana – Southern Cross Road, N of Hyden – Norseman Road [precise locality withheld for conservation purposes], 17.x.2003, J.A. Wege and C. Wilkins JAW 982 (*holo:* PERTH 06815502; *iso:* CANB, K, MEL, W).

Caespitose perennial herb 11–50 cm high. Stem stock compact and part-buried, rarely shortly elongated. *Glandular trichomes* restricted to the inflorescence branches, 0.1–0.3 mm long; stalks multicellular, biseriate, translucent; heads red, ellipsoid, multicellular. *Eglandular trichomes* present in the leaf axils, c. 3–4 mm long, multicellular, uniseriate, cells cylindrical. *Leaves* arranged in a basal tuft, bluish-green (glaucous) tinged red at apex, oblanceolate, flattened in cross section, apex acute to acuminate, margin entire, 1.5–10 cm long, 2–6 mm wide, glabrous. *Scapes* 9–50 cm high, 0.7–3 mm wide, axis glabrous and glaucous. *Inflorescence* c.15–115-flowered, paniculate; branches glandular, 2–19-flowered, 1.5–13 cm long. *Bracts* and *bracteoles* green with red tips, lanceolate to linear-lanceolate, apex acute, margin entire; bracts 2–10 mm long, 1–2 mm wide, glabrous; bracteoles 1.5–5 mm long, glabrous or sparingly glandular at base. *Pedicels* 1.5–6 mm long, glandular. *Hypanthium* ellipsoid, 2–4 mm long, 1.2–2.1 mm wide, glandular. *Calyx lobes* green with red tips, free, apex subacute to acute, margin entire, 1.8–2.3 mm long, 0.8–1.2 mm wide, glabrous or

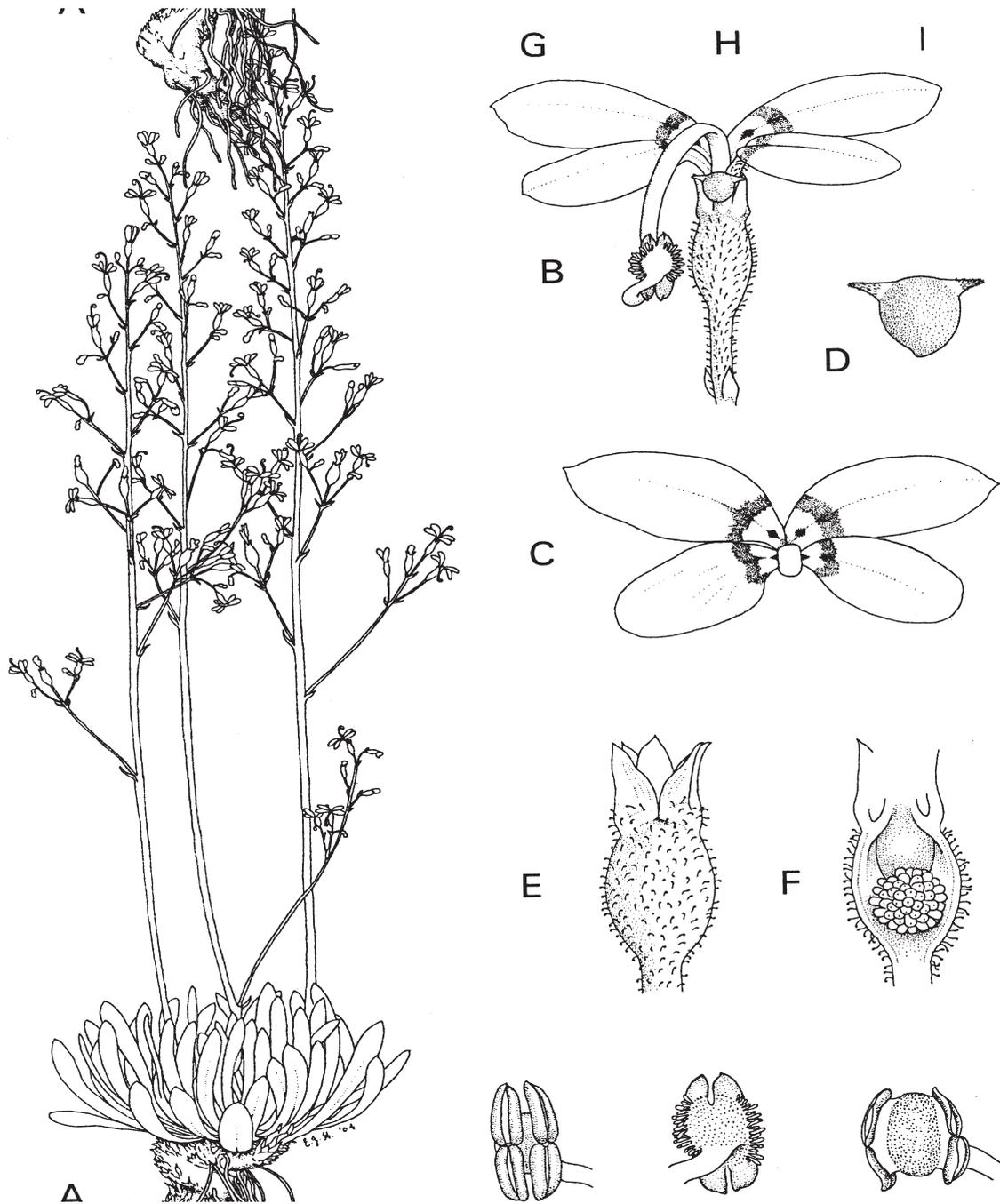


Figure 1. *Stylidium validum* (JAW 982). A, habit x0.5; B, flower x5; C, corolla lobes x5; D, labellum x10; E, hypanthium x7.5; F, L.S. through hypanthium x7.5; G, anthers x8.75; H, column apex showing subtending anther hairs x8.75; I, stigma x8.75. Illustration by Ellen Hickman.

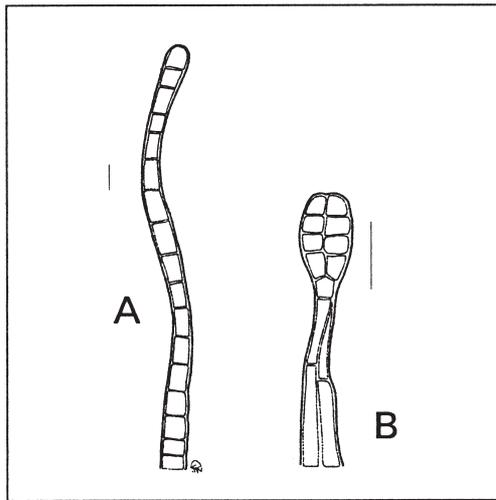


Figure 2. Trichome structure in *Stylidium validum* (JAW 982). A, eglandular trichome (leaf axil); B, glandular trichome (inflorescence). Scale bars at 50 μ m.

sparsely glandular at base. *Corolla* white to pale mauve-pink or pink with prominent mauve-pink external throat markings and smaller inner red markings, throat white; abaxial surface white, glandular; tube 2–3 mm long; lobes laterally-paired, elliptic; anterior lobes 4.5–5.7 mm long, 2.8–3.3 mm wide; posterior lobes 5.5–7.5 mm long, 3–3.8 mm wide. *Labellum* boss yellow with a pink papillose margin, orbicular to broadly ovate, 0.9–1.5 mm long, 0.8–1.4 mm wide; lateral appendages pink or yellow with pink tips, 0.3–0.7 mm long. *Throat appendages* absent. *Column* 11.5–13.7 mm long, glabrous. *Anther locules* black, obliquely angled relative to column, subtending hairs translucent, pollen yellow. *Stigma* sessile, entire, cushion-like. *Capsule* ellipsoid, c. 6.5–8 mm long. *Seed* not viewed. Figs 1–2.

Other specimens examined [precise localities have been withheld for conservation purposes]. WESTERN AUSTRALIA: New Norseman – Hyden Track, 28.ix.1999, B. Archer 1379 (MEL, PERTH); N of Lake Johnson turn-off on Lake King – Southern Cross Road, 25.ix.1971, C.I. Stacey 66 (PERTH); Bremer Range, 19.ix.1994, N. Gibson & M. Lyons 2360 (PERTH).

Phenology. Flowering specimens are known from late September and October.

Etymology. The species epithet is taken from the Latin (*validus* – robust, stout) and refers to the sturdy habit of this species.

Distribution and habitat. *Stylidium validum* is found between Norseman and the Forrestiana – Southern Cross Road (Fig 3) where it occurs in upland, ironstone and greenstone habitats bearing low sclerophyll woodland.

Conservation Status. Conservation Codes for Western Australia Flora: Priority 1. *Stylidium validum* has not been recorded within a conservation reserve and population numbers at each of the known locations appear low. Immediate surveys are recommended given the prevalence of mineral exploration activity in the Forrestiana and Bremer Range regions.

Affinities. *Stylidium validum* is cautiously aligned here to *S. turleyae* Lowrie & Kenneally. This trigger plant, recently described by Lowrie & Kenneally (2004), possesses a comparable habit, inflorescence structure and leaf margin to that of *S. validum*. The flowers of both taxa are also very similar: the corolla lobes are elliptic, bear two sets of throat markings, and lack throat appendages. *Stylidium turleyae* differs most obviously in possessing glandular scapes, narrower leaves and prominent dark pink markings on the abaxial surface of the corolla. Furthermore, *Stylidium turleyae* has a more southerly distribution, with populations scattered across the south coast from near Israelite Bay west to Fitzgerald River

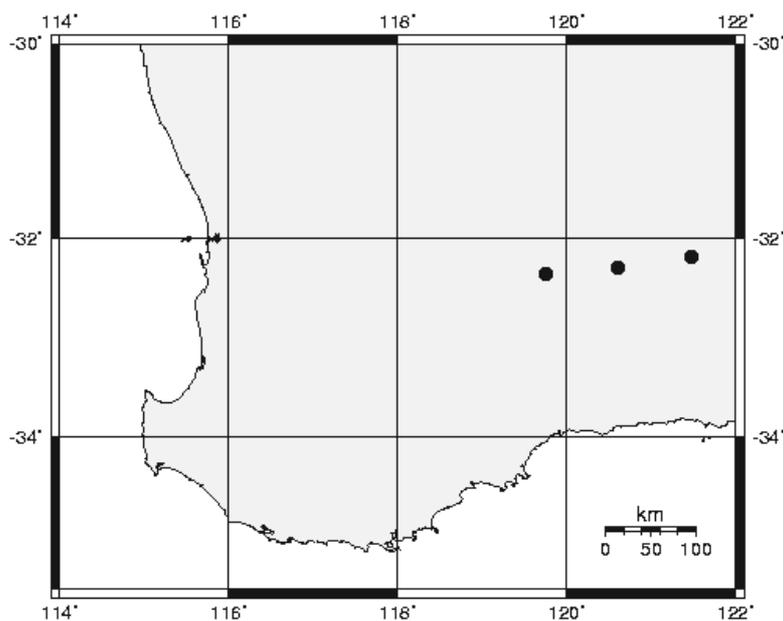


Figure 3. Distribution of *Stylidium validum*.

National Park. It grows in sandy habitats, often in winter-wet localities, rather than on rocky substrates in upland habitats like *S. validum*. Different habitat preferences are often a feature of species differentiation in *Stylidium* (Carlquist 1969; Carlquist 1976; Coates 1982; Wege 2005a).

Stylidium validum is also likely to be confused with *S. limbatum* since these two species possess a comparable habit, inflorescence structure and flower morphology, and have overlapping distributions. *Stylidium limbatum* can be readily differentiated by its densely glandular scape, conspicuous hyaline leaf margin, prominent apical leaf mucro and sandy habitat preference.

Classification. The most recent classification of *Stylidium* is that of the German botanist Mildbraed (1908). Whilst the genus has more than doubled in size since this time, a more up-to-date system is not presently available. On the basis of habit, floral morphology and glandular trichome structure, both *S. validum* and *S. turleyae* are currently best placed in subgenus *Nitrangium* (Endl.) Mildbr. and allied to the basally-tufted species within section *Thyrsiformae* (Benth.) Mildbr. until a formal revision of the infrageneric taxonomy of *Stylidium* is completed.

Rust. The rust pathogen *Puccinia stylidii* McAlpine has been recorded on several species of *Stylidium* (Wege 2005b). *Stylidium validum* and *S. turleyae* can be added to the list of known hosts. In both cases the rust is largely restricted to the leaves and does not appear to have a detrimental impact on overall plant health or reproductive capacity. It is not known how many trigger plants are susceptible to infection by this pathogen.

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