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## ***Stylidium hymenocraspedum* (Stylidiaceae) – a new species for Western Australia, and the lectotypification of *S. maitlandianum***

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### **Abstract**

Wege, J.A. *Stylidium hymenocraspedum* (Stylidiaceae) – a new species for Western Australia, and the lectotypification of *S. maitlandianum*. *Nuytsia* 16(1): 247–253 (2006). A new species of trigger plant with conservation priority, *Stylidium hymenocraspedum* Wege, is described and illustrated. The morphologically allied *S. maitlandianum* E.Pritz. is lectotypified and an amended taxonomic description provided.

### **Introduction**

*Stylidium maitlandianum* E.Pritz., a trigger plant endemic to the northern sandplains of south-west Western Australia, was named by Ernst Pritzel (Diels & Pritzel 1904–05) in honour of the explorer and botanical collector Maitland Brown, who also served as the first resident magistrate at Greenough, Geraldton (Orchard 1999; Shire of Greenough 2002). *Stylidium maitlandianum* is characterised by a basal rosette of spatulate leaves that are adpressed to the soil surface and possess a distinctive irregularly hyaline margin. Flowers are typically purple; however, a yellow-flowered variant occurs south of Badgingarra, just south of the known range of typical *S. maitlandianum*. Whilst corolla colour can vary within species of *Stylidium*, this entity is worthy of specific status on the basis of several additional morphological features. In addition to describing this new species, this paper also serves to lectotypify *S. maitlandianum* and to provide an amended description for this taxon. Both taxa belong to subgenus *Tolypangium* (Endl.) Mildbr. section *Saxifragoidea* Mildbr.

### **Methods**

This study is based on herbarium specimens housed at BM, K, MEL, NSW, P, PERTH and W, and on the field observations of the author. Morphological characters were coded using a combination of fresh, spirit, photographic and herbarium material. Corolla lobe measurements were based solely on material preserved in 70% ethanol from the following collections: *S. maitlandianum* – Wege JAW 211, 646, 728, 917, 919, 932, 934; *S. hymenocraspedum* – Wege JAW 752. Fresh flowering material of *S. hymenocraspedum* provided by Fred Hort was also preserved in ethanol and used for measurement purposes. Data were recorded as a DELTA dataset (Dallwitz *et al.* 1993), from which species descriptions were generated.

### Taxonomy

**Styloidium maitlandianum** E.Pritz. *In* Diels, F.L.E. & Pritzel, E. *Bot. Jahrb. Syst.* 35: 593 (1905). Type citation: "Hab. in distr. Irwin pr. Bukara ad ostium Greenough River in arenosis apertis. *St. striatum* Lindl. e regione illa nunquam adlata est." Specimen label: In fruticetis arenosis inter flumina Moore et Murchison (Bukara), Sept. 1901, *E. Pritzel* 636 (*holo*: B, destroyed WWII; *lecto*, here designated: PERTH 1060260!; *isolecto*: BM!, K 60888!, NSW!, P!, W!).

*Illustrations.* Mildbraed (1908) p. 63, Figure 20 E–G; Grieve and Blackall (1982) p. 731, No. 6.

*Perennial herb*, 29–70 cm high. Stems condensed, sitting at or just below the soil surface. *Leaves* arranged in a dense rosette adpressed to the soil surface; spatulate, flat in cross section, 1–5 cm long, 2–10 mm wide, glabrous; apex subacute, terminating in a blunt knob; margin hyaline, irregular. *Glandular trichomes* 0.1–0.2 mm long; stalks translucent to yellow; heads black, flattened. Eglanular trichomes absent. *Scapes* 28–70 cm high, 0.8–2.5 mm wide, 1–4 per plant, glabrous except for clusters of glandular hairs near the pedicel axils and occasionally above the uppermost whorl of scape bracts; sterile bracts arranged in 3–5 whorls and often scattered below the inflorescence, 5–13 mm long. Inflorescence 9–c. 50-flowered, racemose (lower pedicels rarely 2-flowered). Floral bracts and bracteoles glabrous or glandular on margins. Bracts subulate, 1.5–5.5 mm long, 0.5–0.7 mm wide. Bracteoles 0.7–2.5 mm long. Pedicels 3.5–9 mm long, glandular. *Hypanthium* clavate to elliptic, 1.5–2.9 mm long, 0.7–1.7 mm wide, slightly longitudinally-ribbed, sparsely glandular throughout or with hairs confined to the upper half. Calyx lobes free, 1.8–3.5 mm long (c. equal in length, or with 2 slightly longer than the remaining 3), 0.5–1 mm wide, glabrous or sparingly glandular on margin, margin entire, apex subacute to acute. *Corolla* purple, throat white to yellowish; abaxial surface glabrous. Corolla tube 1–1.8 mm long. Corolla lobes laterally-paired, elliptic to obovate; anterior lobes 4–5.5 mm long, 2.3–4 mm wide; posterior lobes 3.9–5.3 mm long, 2.2–3.8 mm wide. *Labellum* fully twisted across calyx lobes; boss white to yellowish, ovate to elliptic, 0.5–1.2 mm long, 0.4–0.8 mm wide; margin entire; terminal appendage purple, 0.5–1 mm long; lateral appendages absent. *Throat appendages* 6(8), broadly linear with slightly capitate tips, fused at base and arranged in a semi-circle in 2 groups of 3, white to creamy yellow with a purple subapical band and yellow tips, 0.5–0.8 mm long (2 additional anterior teeth occasionally present, 0.15–0.2 mm long). *Column* 7.5–9.5 mm long. Anthers red–black; subtending hairs absent; pollen yellow. Stigma entire, sessile, elliptic, cushion-like. *Capsule* ellipsoidal, 3–3.5 mm long. Seed not viewed. (Figure 2B)

*Selected specimens examined.* WESTERNAUSTRALIA: Burma Rd, SE of Walkaway, SE of Geraldton, 10 Sept. 1967, *A.M. Ashby* 2318 (PERTH); 41 miles W of Coorow, 3 Oct. 1974, *S. Carlquist* 5910 (NSW, PERTH, RSA); W side of Natta Rd, 36 km SW of Mingenew, 26 Sept. 1994, *A. Carr* 295 (PERTH); 38 km S of the Geraldton Hwy turnoff on the Eneabba road, 28. Sept. 1976, *R.J. Chinnock* 3198 (AD, PERTH); Hi Vallee property, Warradarge, 23 Oct. 1999, *M. Hislop* 1723 (PERTH); S side of Hill River Bridge on road 9.5 miles E of Jurien Bay S to Cadda Rd, Oct. 1971, *S. James* 71.10/28 (PERTH); Strawberry–Walkaway road, c. 46 km S of Walkaway, 28 Sept. 1976, *R.W. Johnson* 3359 (BRI, PERTH); 8 km due E of Jurien, 3 Oct. 1971, *S. Paust* 1174 (PERTH); c. 3 km from Cockleshell Gully Rd on the track to Mount Lesueur, Lesueur National Park, 28 Sept. 2002, *J.A. Wege & C. Wilkins* JAW 646 (PERTH); c. 3.8 km W of Coalara Rd on Marchagee Track, Watheroo National Park, 24 Oct. 2002, *J.A. Wege* JAW 728 (PERTH); c. 9 km S of Eneabba on Brand Hwy, 9 Oct. 2003, *J.A. Wege* JAW 932 (PERTH); Sandhill between Dandaragan and Badgingarra – midway between Perth and Geraldton, near coast, 6 Oct. 1961, *J.H. Willis s.n.* (MEL).

*Distribution and habitat.* Known from Watheroo National Park, west towards Jurien Bay, and north to the Geraldton District. Grows on sand in heath, shrubland, or open *Banksia* and/or *Eucalyptus* woodland.

*Phenology.* Flowering specimens have been collected during September and October.

*Conservation status.* Represented within several conservation reserves. No conservation code applies.

*Typification.* No collections were cited with the description of *S. maitlandianum*. Three collections from Diels and Pritzel's expedition are known: *Diels s.n.* (Between Champion Bay and Mount Hill), *Diels 488* (Victoria District, N of Dongara), and *Pritzel 636* (In fruticetis arenosis inter flumina Moore et Murchison). These collections were all made in the same general vicinity (ie. between Dongara and Champion Bay) and may represent three separate localities, or may be different expressions of the same locality. The type locality as stated in the protologue – “near Bukara [Bookarra] to (or near to) the mouth of the Greenough River” is similarly ambiguous. It could be interpreted as referring to a single location, or alternatively it may represent a more general description encompassing some or all of the above-mentioned collections.

The unnumbered Diels collection (MEL 233020) bears a National Herbarium of Victoria label with two sets of annotations. In one hand there is an identification as *S. striatum* Lindl., with a corresponding annotation “with scarious edge more prominent than usual; slightly darker flowers”. It is of note that *S. striatum* is also mentioned in Pritzel's protologue. The second annotation, in a different hand, provides the locality and collector information, along with the correct identification. It is not known who wrote these annotations; neither hand appears to match that of Diels. It is possible that this specimen is one of seven types collected by Diels or Pritzel and later donated to MEL (see Short 1990).

*Diels 488* (PERTH 1060198) is labelled “*Stylidium Maitlandi* Diels”, indicating that Diels was initially going to describe this species. This sheet bears no details linking it to Pritzel's protologue other than the collection date (September 1901). It is unclear whether Pritzel used this collection in his description of *S. maitlandianum*. Duplicates of *Pritzel 636*, housed at a number of institutions in Australia and Europe, are similarly labelled “*Stylidium Maitlandi* Diels”.

Although there are no collections cited with the description of *S. maitlandianum*, the catalogue of Pritzel's collections identifies *Pritzel 636* as *S. maitlandianum* E. Pritzel *n. sp.* (p. 638). Since the description and the catalogue entry were published together in April 1905 (Volume 35, part 5), both can be taken as constituting Pritzel's protologue. The collections of Diels are therefore not recognised as types in this study as they were not cited in this protologue.

The Berlin sheet of *Pritzel 636* (the holotype) was destroyed during World War II (Botanical Museum Berlin-Dahlem 1999); however, a fragment of this specimen was procured by Charles Gardner when he visited Berlin during his term as ABLO in 1937 (Green 1990). This fragment, now housed at PERTH, is chosen here as a suitable lectotype. It is unique amongst the viewed duplicates of *Pritzel 636*. The annotation “*Stylidium Maitlandi* Diels” has been crossed out and replaced with “*S. maitlandianum* E. Pritz. *n. sp.*”, with a further annotation of “Bukara”. It has not been confirmed whether this annotation is in Pritzel's hand since a sample of his handwriting was not available for comparison.

*Chromosome number.* James (1979) recorded a chromosome number of  $n = 12$  (PERTH 01060732 and PERTH 01060759).

*Notes.* *Stylidium maitlandianum* can be readily differentiated from all other trigger plants on account of the following combination of features: spatulate leaves with an irregular hyaline margin, scapes with 2–5 whorls of bracts, and purple, laterally-paired flowers bearing throat appendages. Differences to *S. hymenocraspedum* are discussed in the notes below.

***Stylidium hymenocraspedum* Wege, sp. nov.**

*Stylidio maitlandiano* affine sed corolla flava et columna longiore differt.

*Typus*: Waddi Road, Badgingarra [precise location withheld for conservation purposes], 9 Oct. 2002, F. & J. Hort 1854 (*holo*: PERTH 06196683!; *iso*: CANB!, MEL!).

Perennial herb, 27–75 cm high. Stems condensed, sitting at or just below the soil surface. Leaves arranged in a dense rosette adpressed to the soil surface; spatulate, flat in cross section, 1.5–7 cm long, 6–13 mm wide, glabrous; apex subacute, terminating in a blunt knob; margin hyaline, irregular. Glandular trichomes 0.11–0.25 mm long; stalks translucent to yellow; heads black, flattened. Eglandular trichomes absent. Scapes 25–73 cm high, 1–2.6 mm wide, 1–4 per plant, glabrous except for clusters of glandular hairs immediately above each whorl of bracts and near the pedicel axils; sterile bracts arranged in 3 or 4 whorls and often scattered below the inflorescence, 6–12 mm long. Inflorescence 20–c.50-flowered, racemose. Floral bracts and bracteoles glabrous or glandular on margins. Bracts subulate, 2–7.5 mm long, 0.6–0.9 mm wide. Bracteoles 1–2.5 mm long. Pedicels 3–12 mm long, glandular. *Hypanthium* clavate to elliptic, 2–3.5 mm long, 0.9–1.9 mm wide, slightly longitudinally-ribbed, sparsely glandular throughout or with hairs confined to the upper half. Calyx lobes free, 2–4.5 mm long (2 slightly to noticeably longer than the remaining 3), 0.7–1.3 mm wide, glabrous or sparingly glandular on margin; margin entire; apex subacute to acute. Corolla yellow; abaxial surface yellow, or striped maroon, glabrous. Corolla tube 0.8–1.5 mm long. Corolla lobes laterally-paired, elliptic to obovate; anterior lobes 5–6.5 mm long, 2.8–4.5 mm wide; posterior lobes 4.5–6 mm long, 2.3–5 mm wide. *Labellum* fully twisted across calyx lobes; boss yellow, ovate, 0.6–1 mm long, 0.5–0.8 mm wide; margin entire, maroon; terminal appendage maroon, 0.1–0.8 mm long; lateral appendages absent. *Throat appendages* 6, broadly linear with slightly capitate tips, fused at base and arranged in a semi-circle, yellow, 0.6–1.2 mm long. *Column* 9.5–12 mm long. Anthers red–black; subtending hairs absent; pollen whitish to yellow. Stigma entire, sessile, elliptic, cushion-like. *Caspule* ellipsoidal, c. 4–4.5 mm long. Mature seed not viewed. (Figures 1, 2A)

*Selected specimens examined*. WESTERN AUSTRALIA [precise localities withheld for conservation purposes]: Brand Hwy, N of Waddi Rd, 9 Oct. 2002, F. & J. Hort 1852 (PERTH); Brand Hwy, N of Waddi Rd, 9 Oct. 2002, F. & J. Hort 1853 (PERTH); Wongonderrah Rd, 9 Oct. 2002, F. & J. Hort 1855 (PERTH); N of Mullering Brook Bridge on Gingin–Jurien Bay Rd, Sept. 1974, S. James 74.9/14 (PERTH); W of Badgingarra–Eneabba highway along Cadda Rd, Oct. 1971, S. James 71.10/42 (PERTH); E on Waddi Rd from Brand Hwy, 25 Oct. 2002, J.A. Wege JAW 752 (PERTH).

*Distribution and habitat*. *Stylidium hymenocraspedum* is known only from the Badgingarra area. Grows on sand in heath, or *Banksia* and *Eucalyptus todtiana* low open woodland.

*Phenology*. Flowers have been recorded from September to October.

*Conservation status*. Conservation Codes for Western Australian Flora: Priority Two. Whilst *S. hymenocraspedum* is represented within Badgingarra National Park, it is geographically restricted and known from only a few populations. In need of further survey.

*Etymology*. The specific epithet is taken from the Greek (*hymen* – membranous, *craspedus* – margined) in reference to the conspicuous hyaline leaf margin.

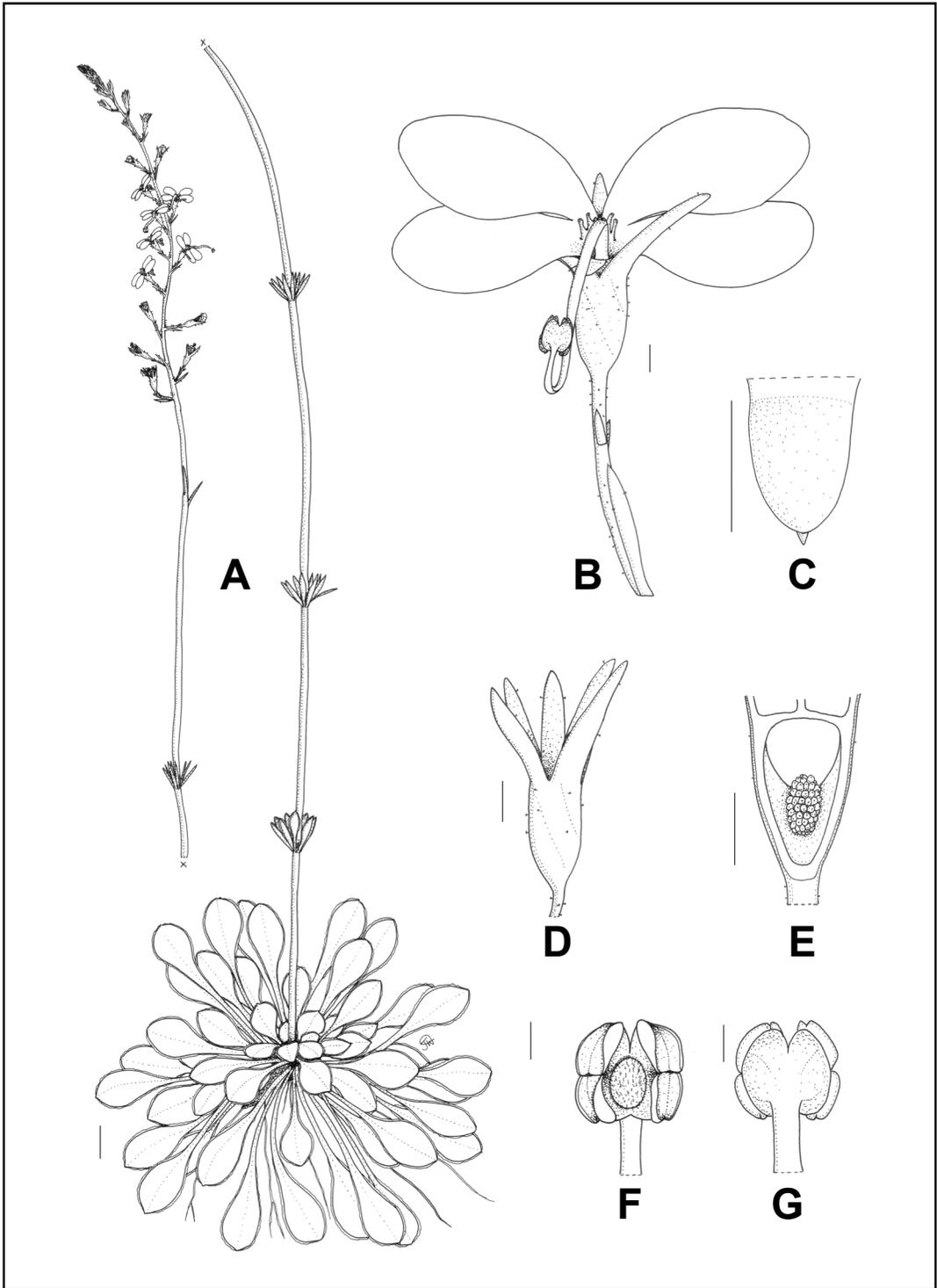


Figure 1. *Stylidium hymenocraspedum*. A – habit; B – flower; C – labellum; D – hypanthium and calyx lobes; E – L.S. of hypanthium; F – apex of column showing dehiscent anthers and developing stigma; G – apex of column showing connective region. Illustrations drawn from the following collections. A: *F. & J. Hort* 1854 (holotype); B–C: *Hort s.n.* (spirit collection); D–G: *Wege* JAW 752.

**Chromosome number.** James (1979) recorded a chromosome number of  $n=12$  under *S. maitlandianum* (PERTH01060767).

**Affinities.** There are a number of morphological features that differentiate *S. hymenocraspedum* from *S. maitlandianum*. Plants tend to be more robust, and the flowers typically possess a longer column, and longer corolla lobes that are predominantly yellow rather than purple. Two of the calyx lobes are longer than the remaining three (this is particularly apparent in the bud stage), rather than of similar length (or only fractionally longer). Glandular hairs are present in the axils of the scape bracts unlike *S. maitlandianum*, in which they are absent or restricted to the uppermost whorl.

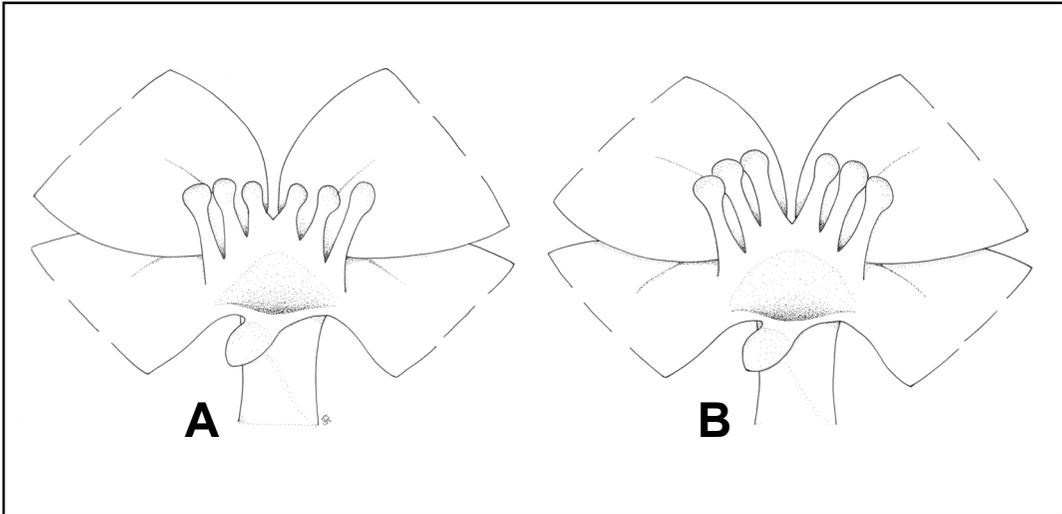


Figure 2. Throat appendage arrangement. A – *S. hymenocraspedum* (JAW 752); B – *S. maitlandianum* (JAW 917).

The throat appendages are a different colour in each species and, although comparable in shape, they are fused in a different manner. In *S. hymenocraspedum* they are fused at the base to form a semi-circular sheath, with the posterior appendages fused to about half their length across the posterior corolla lobes (Figure 2A). Although still fused at the base, the throat appendages in *S. maitlandianum* are arranged in two groups of three (Figure 2B). As noted by Raulings & Ladiges (2001), throat appendage number can vary within species of *Stylidium*, but the manner in which they are fused can be taxonomically informative.

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