

***Stachystemon exilis* (Euphorbiaceae), a new and potentially threatened species from the Swan Coastal Plain**

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SHORT COMMUNICATION

The small, endemic Western Australian genus *Stachystemon* Planch. (Euphorbiaceae: Caletieae: Pseudanthinae) was last revised by Halford and Henderson (2003) at which time nine species were recognised. *Stachystemon exilis* Hislop & R.W.Davis, a new and uncommon species from the Swan Coastal Plain described below, is the first to be published since that treatment. Although the earliest collections of this species were made before the revision was completed, it appears that its authors had no opportunity to examine this material during the course of their studies.

Despite the fact that the Swan Coastal Plain bioregion (Department of the Environment 2013) is co-extensive with the most densely populated and highly developed part of Western Australia, new plant species from this area are still being described on a regular basis, many of them rare or poorly known. Indeed, more than 50 conservation-listed taxa with distributions centred on this region have been described in the past 20 years, and a further 35 are informally named and require taxonomic resolution (Western Australian Herbarium 1998–).

Stachystemon exilis* Hislop & R.W.Davis, *sp. nov.

Type: south of Busselton, Western Australia [precise locality withheld for conservation reasons], 20 November 2018, *M. Hislop* 4782 (*holo:* PERTH 09077782; *iso:* BRI, CANB, K, MEL).

Stachystemon sp. Keysbrook (R. Archer 17/11/99), Western Australian Herbarium, in *FloraBase*, <https://florabase.dpaw.wa.gov.au/> [accessed 6 April 2018].

Monoecious, erect *shrubs*, apparently to 100 cm high, but probably more usually 20–30 cm. Young *branchlets* very fine, terete to obscurely quadrangular, with two opposite, well-demarcated rows of short hairs extending between the internodes, on and between the ridges produced by the decurrent stipule bases; the hairs rather thick, obtuse, to *c.* 0.05 mm long. *Leaves* petiolate, opposite; petiole 0.4–0.6 mm long, cream to pale brown, glabrous abaxially, the lower adaxial surface with a sparse tuft of hairs to 0.3 mm long; stipules very narrowly triangular, 0.4–1.0 mm long, 0.1–0.2 mm wide, glabrous or with a few short hairs on the inner margins, brown ageing to grey; leaf base attenuate to cuneate; leaf blade linear or very narrowly ovate, 6–15 mm long, 0.5–1.2 mm wide, acute and

mucronate with a fine, pale mucro 0.3–0.7 mm long, strongly concave adaxially or \pm involute, adaxial surface glabrous, abaxial surface papillose; leaf margins noticeably paler than the blade. *Inflorescence* axillary, of solitary flowers, extending down the flowering branchlets for many nodes, ebracteate. *Flowers* 4-merous, pedicellate, glabrous, ebracteolate. *Male flowers* on slender, usually slightly recurved pedicels, pedicels 1.2–2.0 mm long; calyx lobes of similar size and shape (the inner pair slightly wider), broadly to depressed-ovate, 0.7–1.0 mm long, 0.7–1.2 mm wide, greenish yellow, \pm hooded, obtuse; receptacle very short, slightly convex, *c.* 0.5 mm long, 1.3–1.5 mm diam., with sparse brown hairs; stamens 10–20, grouped in an oval or \pm rectangular formation, interspersed with a few pale, cylindrical, gland-like projections; filaments obscure, thick, *c.* 0.1 mm long, with sparse brown hairs; anthers 0.15–0.25 mm long, yellow. *Female flowers* on pedicels 0.4–1.0 mm long, pedicels shorter and thicker than the male; calyx lobes dissimilar, often irregularly toothed, greenish yellow, the outer pair 1.1–1.8 mm long, 0.5–0.7 mm wide, narrowly ovate, acute, \pm keeled, the inner pair 0.8–1.3 mm long, 0.7–1.0 mm wide, broadly ovate-elliptic, obtuse or acute; ovary compressed-ellipsoid, 0.6–0.8 mm long, 0.5–0.6 mm wide, 2-locular, with 2 ovules per locule; styles 2, 1.2–1.8 mm long, \pm free, glabrous, spreading from close to the base and recurved in the upper 1/2, stigmatic surfaces becoming red. *Fruit* compressed-ovoid, 4.5–6.0 mm long (including style remnants), 2.8–3.3 mm wide, 1-seeded, glabrous, slightly rugose. *Seeds* slightly compressed, subglobose, 2.6–3.5 mm long (excluding caruncle), 2.3–3.0 mm wide, pale to mid-brown; exostome pit well-developed; caruncle 0.8–1.2 mm long, 0.8–1.0 mm wide, with a \pm truncate apex. (Figure 1)

Diagnostic characters. Distinguished from all other species within the genus by the following character combination: leaves consistently opposite, mucronate; young branchlets with short hairs in longitudinal rows; inflorescences lacking bracts and bracteoles.

Other specimens examined. WESTERN AUSTRALIA: [localities withheld for conservation reasons] 17 Nov. 1999, R. Archer & M. Wood MET 20752 (PERTH); 19 Oct. 1994, B.J. Keighery 2025 (PERTH); 19 Oct. 1994, B.J. Keighery *s.n.* (PERTH); 5 Oct. 2009, B. Loudon Q2-15 (PERTH).

Distribution and habitat. Currently known from three disjunct localities in the Swan Coastal Plain bioregion: one from a northern Perth suburb, another about 60 km south of Perth, and the third from the Busselton area. The habitat at each site is open, low-lying *Banksia* woodland in which *B. ilicifolia* is a significant component of the upper canopy. Other associated species are *Melaleuca preissiana*, *M. thymoides*, *Adenanthos meisneri* and *Hypocalymma angustifolium*.

Phenology. All collections of the species to date were made in October and November and include male and female flowers at anthesis as well as mature fruit. This suggests that the flowering period is likely to be a lengthy one, in common with other members of the genus.

Etymology. From the Latin *exilis* (thin, slender), a reference to its very fine growth habit and narrow leaves.

Vernacular name. Slender Stachystemon.

Conservation status. Currently listed by Smith and Jones (2018) as Priority One under Conservation Codes for Western Australian Flora under the name *S. sp.* Keysbrook (R. Archer 17/11/99). The fact that the first collection of this species was made as late as 1994, from an area of the State that is both well-known botanically and heavily developed, suggests that it is likely to be a genuinely rare plant. Our recent efforts to relocate the species at the two northern localities were unsuccessful.



Figure 1. Branchlet of *Stachystemon exilis*, showing male flowers and mature fruit. Photograph by Rob Davis from *M. Hislop* 4782.

Affinities. *Stachystemon exilis* is a distinctive species being the only one in the genus apparently lacking bracts and bracteoles. Its shortly hairy branchlets are also unusual and shared only with *S. mucronatus* Halford & R.J.F.Hend. from the Fitzgerald River area. Both species also have distinctly mucronate leaves but can be readily distinguished by their phyllotaxis: consistently opposite in *S. exilis* and alternate or occasionally opposite at some nodes in *S. mucronatus*. In addition, the leaves of *S. exilis* are noticeably narrower (to 1.2 mm wide *cf.* 1.2–2.5 in *S. mucronatus*) and the pedicels of the male flowers are longer (1.2–2.0 mm *cf.* 0.5–0.8).

Two other species of *Stachystemon* have consistently opposite leaves, *S. nematophorus* (F.Muell.) Halford & R.J.F.Hend. and *S. intricatus* Halford & R.J.F.Hend. The former is restricted to the Kalbarri area and differs most obviously from *S. exilis* in the morphology of the male flowers, which are more or less sessile and 6-merous, with one of the inner calyx lobes filiform and much longer than the others. In *S. exilis* by contrast the male flowers are clearly pedicellate (pedicels 1.2–2 mm long) and 4-merous, with calyx lobes of similar size and shape.

Stachystemon intricatus has a fairly wide distribution in drier parts of south-western Western Australia, extending from the southern Carnarvon bioregion southwards to the northern part of the Avon Wheatbelt bioregion. It is easily distinguished from *S. exilis* by its divaricate growth habit, and its short, thick leaves to 2.5 mm long that are often densely clustered on short branchlets.

Notes. There are a couple of minor morphological differences between plants from the northern populations and those from the southern. The inner female calyx lobes of the latter are acute rather than obtuse and the leaves tend to be somewhat larger.

At the type location near Busselton, plants were only found growing up through other more robust shrubs that afforded them some protection; they were never found in open, unprotected sites. A later examination of the type material showed evidence of damage consistent with grazing. This was also noted on one of the collections from metropolitan Perth (*B.J. Keighery s.n.*). During our recent, fruitless search of the Perth site, it was observed that kangaroo numbers were high, with the local vegetation showing signs of degradation as a probable consequence. There is therefore some reason to believe that *S. exilis* is very palatable to kangaroos and that it may not be able to withstand the resulting grazing pressure when animal numbers are high.

Identification. In order to accommodate the new species, Halford and Henderson's (2003: 516) key to species requires modification as follows:

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| 1. | Young branchlets manifestly hairy with spreading, acute hairs to 0.8 mm long..... | S. virgatus |
| 1: | Young branchlets glabrous or with very short, obtuse hairs to 0.05 mm long..... | 2 |
| 2. | Tepals of male flowers all ± similar | 3 |
| 2: | Tepals of male flowers dissimilar, either 1 or 3 inner tepals much longer than outer tepals..... | 6 |
| 3. | Young branchlets with short, obtuse hairs to 0.05 mm long; leaves prominently mucronate..... | 3a |
| 3: | Young branchlets glabrous; leaves not mucronate | 4 |
| 3a. | Leaves strictly opposite, to 1.2 mm wide, pedicels of male flowers 1.2–2 mm long..... | S. exilis |
| 3a: | Leaves mostly alternate, occasionally opposite at some nodes, 1.2–2.5 mm wide, pedicels of male flowers 0.5–0.8 mm long..... | S. mucronatus |

Acknowledgements

We acknowledge the role of botanist Malcolm Trudgen who first recognised that *S. exilis* was taxonomically distinct and went on to raise the phrase name *S. sp.* Keysbrook.

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