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Additions to *Eremophila* (Scrophulariaceae)

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Abstract

Chinnock, R.J. Additions to *Eremophila* (Scrophulariaceae). *Nuytsia* 30: 215–219 (2019). One new species of *Eremophila* R.Br., *E. waitii* Chinnock, is described and one subspecies of *E. glabra* (R.Br.) Ostenf., *E.glabra* subsp. *verrucosa* Chinnock, is raised to species level and recognised herein as *E. viridissima* Chinnock.

Introduction

Since the treatment of 215 species of *Eremophila* R.Br. in the Myoporaceae monograph by Chinnock in 2007, an additional 19 species have been added to the genus (See Brown & Buirchell 2007; Chinnock & Doley 2011; Edginton 2015; Buirchell & Brown 2016; Brown & Davis 2016; Brown *et al.* 2018). The addition of the two species here brings the current number of recognised species in *Eremophila* to 238.

A recently discovered endangered species of *Eremophila* from the northern Wheat Belt of Western Australia is described and a subspecies of *Eremophila glabra* (R.Br.) Ostenf., described by Chinnock (2007), is raised here to species level.

Taxonomy

Eremophila waitii Chinnock, *sp. nov.*

Type: Mullewa, Western Australia [precise locality withheld for conservation reasons], 21 September 2018, *R.J. Chinnock* 10600 (*holo*: PERTH 09083618; *iso*: AD, CANB, MEL).

Eremophila sp. Mullewa (R. Wait 7311), Western Australian Herbarium, in *FloraBase*, https://florabase.dpaw.wa.gov.au/ [accessed 20 January 2019].

Erect, densely branched aromatic shrub 1–1.5(–2.5) m tall, bark pale grey, rugose. *Branches* distinctly ribbed, ribs extending down from raised leaf bases, obscurely tuberculate, resin extruded in dried specimens as small translucent bubbles, densely finely stellate-tomentose, glabrescent in older parts. *Leaves* very densely clustered along branches, ± alternate-sub-whorled or in whorls of 3, straight or slightly curved, linear-subterete, tapering towards tip, broadly acute to obtuse, (6–)10–18(–26) mm

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× 0.5–0.9(–1.1) mm, dendritic pubescent to dendritic-tomentose, glabrescent. *Flowers* 1 per axil, subsessile (pedicel <1 mm), densely clustered into strobiloid structures 30–40 mm long at branch tips, and flowers developing from base upwards or opening at various positions along strobilus at same time. *Sepals* 5, subequal, valvate, lanceolate, acute, 5–8 × 0.7–1.2 mm; outer surface densely clothed in large dendritic hairs partially or completely obscuring sepals except at tip, inner surface with long dendritic hairs in distal half, glandular pubescent below; green or dark purple. *Corolla* 9–15 mm long, outer surface and inside of lobes and upper inside of tube deep lilac, inside of tube below lower lip white with purple spots; outside surface and inner surface of lobes glabrous, tube with white woolly hairs especially in lower part; lobes obtuse. *Stamens* 4, enclosed, filaments glabrous. *Ovary* oblong, 4-locular with 1 ovule per loculus, glabrous. *Fruit* dry, obconical, 3–4.5 × 2.5–3.0 mm, exocarp papery, bifid at apex, rugulose, very pale brown; endocarp, brown, split into 4 at apex, rugulose, granular with numerous minute resinous spots. *Seed* oblong, *c.* 1.5 × 0.5 mm, pale cream. (Figure 1)

Diagnostic features. *Eremophila waitii* is readily distinguished from other species in *Eremophila* sect. *Australophilae* Chinnock in having sub-whorled to 3-whorled, densely pubescent to densely tomentose, linear-subterete leaves that are clustered along the branches and flowers aggregated together into woolly strobili 30–40 mm long at branch tips.

Figure 1. *Eremophila waitii*. A – type population; B – habit, note the much taller senescent plant in background (centre); C – inflorescence showing the well-defined strobili and flowers emerging from various places; D – comparison between *E. waitii* (left) and the larger flowered *E. nivea* (right). Vouchers: *R.J. Chinnock* 10599 (C, D left (right not vouchered). Photographs by R.J. Chinnock.

Other specimens examined. WESTERN AUSTRALIA. [localities withheld for conservation reasons] 14 Sep. 2018, *B. Buirchell* BB332 (PERTH, image seen); 19 Aug. 2018, *R. Wait* 7311 (PERTH, image seen).

Phenology. Flowers appear from late winter to at least mid-spring with fruits maturing from early spring onwards.

Distribution and habitat. *Eremophila waitii* is known only from one population consisting of about 55 plants (Figure 1A) in a very small area around low sandstone rock outcrops. It was growing with *Melaleuca* and *Acacia* species, *Solanum* sp., various chenopods and a mixed annual ground cover of composites and grasses in an open area in remnant low mallee woodland. It is possible that because many of the plants were very close together they may have resulted vegetatively from root-suckering, but this could not be confirmed.

Most plants in the population were between 1–1.5 m tall and wide (Figure 1B) with a rounded crown but a few senescent plants, usually with a few unbranched stems, were up to 2.5 m tall. It was noted that leaves on new vigorous basal branches of actively growing plants are longer (≥18 mm) with a more sparse indumentum and more obviously resinous.

Conservation status. *Eremophila waitii*, is known only from the one population and has recently been listed as a Priority One species under the Conservation Codes for Western Australian flora under the name *Eremophila* sp. Mullewa (R. Wait 7311) (Western Australian Herbarium 1998–).

Etymology. Named after Russell Wait, who over many years has trekked to various parts of Australia, but especially Western Australia, to study and collect *Eremophila*. I am delighted to name this species after him in recognition of the many new or rare species that he has discovered and introduced into cultivation and the significant contribution he has made to our understanding of this genus.

Affinities. *Eremophila waitii* is most closely related to *Eremophila subangustifolia* A.P.Br. & Llorens (see *Notes*) and *E. microtheca* (F.Muell. ex Benth.) F. Muell., sharing with these species the dendritic-pubescent or dendritic-tomentose leaves and branches. It is readily distinguished from these species by having a well-defined strobiloid inflorescences (Figure 3) at the branch tips rather than having scattered flowers along the upper parts of the branches. *Eremophila nivea* Chinnock is also closely related to *E. waitii* sharing a similar dense white to grey-white indumentum on the branches and leaves. *Eremophila nivea* can have a ± loose cluster of flowers near the apex (Figure 4) but it is readily distinguished from *E. waitii* by the larger flowers 15–23 mm long (*cf.* 9–15 mm long), and the distinctly flattened, broader, leaves 1.5–3.5 mm wide (*cf.* 0.5–0.9(–1.1) mm wide).

The four species *E. waitii*, *E. subangustifolia*, *E. microtheca* and *E. nivea* form a well-defined group within *Eremophila* sect. *Australophilae*. All four species share a strong and distinctive musky odour, although it is not initially as strong in *E. waitii* the smell becomes more obvious in dried herbarium specimens.

Notes. Chinnock (2007) noted that northern populations of *E. microtheca* in the Kalbarri National Park differed from more southern ones in the Lake Indoon–Lake Logue depression area, in having distinctly flattened leaves. Brown *et al.* (2018) undertook a molecular study of the two forms and found significant divergences between plants found in the two areas. Subsequent field work and herbarium studies on the populations by one of the authors (A.P. Brown) resulted in additional morphological

features being identified and as a consequence, the southern form was described as a new species, *Eremophila subangustifolia* (Brown *et.al.* 2018).

Eremophila viridissima Chinnock, *nom. et stat. nov.*

Eremophila glabra subsp. *verrucosa* Chinnock, *Eremophila* 592 (2007). *Type*: Lake Raeside, Western Australia, 22 September 1986, *R.J.Chinnock* 7273 (*holo*: AD 98647195; *iso*: K 000961395, MEL 2147389, PERTH 07538677, US 01050399).

Etymology. From the Latin *viridissima*, very green; referring to the deep green leaves.

Figure 2. *Eremophila viridissima* flowering stem showing the distinctive ascending, deep green leaves. Photograph by R.J. Chinnock.

Notes. *Eremophila viridissima* is well defined (see description in Chinnock 2007, p. 592) and is now considered as distinct from typical *E. glabra* as are satellite species like *E. subteretifolia* Chinnock, *E. subfloccosa* Benth. and *E. denticulata* F.Muell. (Figure 2; see also Chinnock 2007, unnumbered Figure on p. 592 and Figure 297 p. 593, as *E. glabra* subsp. *verrucosa*). The species is readily distinguished from *Eremophila glabra* by its ascending, resinous deep green leaves, branches that are usually not divided in the upper parts and its distinctly verrucose endocarp of the fruit. When stressed, leaves of *E. viridissima* may turn yellowish green.

When I published the account of *Eremophila glabra* in 2007, I recognised nine subspecies but noted that the treatment was a tentative subdivision of this large polymorphic super species that includes a number of polyploid states (n=18, 36, 54). A number of these subspecies were known to be complexes in themselves like subsp. *elegans* Chinnock, subsp. *albicans* (Bartling) Chinnock and subsp. *tomentosa* Chinnock. Furthermore, these often showed intergradation e.g. subsp. *elegans* and subsp. *tomentosa.* To further complicate matters, I was also aware that some of the subspecies were essentially 'buckets' consisting of a number of taxa that required a more detailed study before segregation could occur. Subsp. *tomentosa*, for example, consists of at least three taxa: one in inland WA that forms large intricate plants 1.5 m tall and broad; the type form found on coastal cliffs around Kalbarri that is often a spindly shrub up to 1.8 m tall with one or a few main stems branched in the upper parts; and a third common in coastal areas around Geraldton and northwards, including off-shore islands, which is a prostrate plant or an erect shrub. These forms were beyond the scope of the monograph and required a more detailed study to make sense of these complexes. I also acknowledged that *Eremophila glabra* was part of a larger complex, which at that time included seven very closely related species that were actively in the process of speciation. *Eremophila calcicola* R.W.Davis has since been added to this complex (Brown & Davis 2016) and I am also aware of a number of other un-named taxa belonging to this group. Hopefully, the current molecular studies being undertaken by Dr R. Fowler at the University of Melbourne will resolve many of the problems found within the Glabra group.

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