Eremophila koobabbiensis (Scrophulariaceae), a new, rare species from the wheatbelt of Western Australia

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Abstract

Chinnock, R.J. & Doley, A.B. *Eremophila koobabbiensis* (Scrophulariaceae), a new, rare species from the wheatbelt of Western Australia. *Nuytsia* 21(4): 157–162 (2011). *Eremophila koobabbiensis* Chinnock, *sp.nov*., is described and illustrated. This rare species is known only from one area north of Moora and its conservation is discussed. It is also established in cultivation and its long-term survival is assured.

Introduction

When the monograph of *Eremophila* and allied genera was published (Chinnock 2007) one of the authors of this paper (RJC) was aware of a number of undescribed species in Western Australia that had been seen in the field or had been isolated from existing herbarium collections but were either inadequate for the preparation of accounts for publication, or were discovered too late to be included in the monograph. Andrew Brown (Department of Environment and Conservation, Western Australia) also drew attention to other new species of which he was aware. Since the publication of the monograph, two new taxa, *E. grandiflora* A.P.Br. & B.Buirchell and *E. densifolia* F.Muell. subsp. *erecta* A.P.Br. & B.Buirchell have been published (Brown & Buirchell 2007).

In this paper a new and rare species is described and illustrated. *Eremophila koobabbiensis* is known only from Koobabbie Farm north of Moora usually as small numbers of scattered plants and these have been protected and conserved by the property owners (A.B. Doley and the late J. Doley), both of whom have had a long interest in native plants and their conservation. The two areas where the populations of *E. koobabbiensis* occurred were fenced off from stock in 1986 and 1991 at the owners' expense and they were advised in 1999 that it was a new species. The species was listed as Declared Rare Flora in 2005 under the *Western Australian Wildlife Conservation Act 1950* and listed as critically endangered in 2009 under the *Environment Protection and Biodiversity Conservation Act 1999*. An interim recovery plan for the species was published by Douglas in 2007.

Cutting material was obtained from a number of plants on a visit to Koobabbie in 2001 (RJC) and plants are now well established and preserved in cultivation in South Australia and Victoria. Plants are also grown at the Botanic Gardens and Parks Authority (Kings Park, Perth) and an approved replanting translocation project has also occurred on Koobabbie Farm.

Eremophila koobabbiensis Chinnock, *sp. nov.*

Frutex erectus ramis (et foliis, sepalis) dense glandularo-pubescentibus cum longior eglandularo-pubescentibus; foliis imbricates, ternato-verticillatis vel subternato-verticillatis, oblongis ad linearo-ellipticis lobis in 1–2 paribus raro aliquot integris; floribus solitaribus, sessilibus; sepalis valvatis, aequalis, linearo-lanceolatis; corolla lilacina ad dilute malvina, eglandularo-pubescentia; fructu sicco, ovoideo ad late ovoideo, villoso.

Typus: Koobabbie Farm, north of Moora, Western Australia, September 2001, *A. Doley s.n.* (*holo*: PERTH 06114555; *iso*: AD, B, CANB, K, MEL, MO).

Eremophila sp. Koobabbie (R.J.Chinnock 9540), C.Douglas, B.Todd & A.Brown, *Koobabbie poverty bush (Eremophila koobabbiensis ms)*: *interim recovery plan*, *2007–2012*.

Eremophila koobabbiensis Chinnock ms, Western Australian Herbarium, in *FloraBase*, http://florabase.dec.wa.gov.au [accessed 23 July 2011].

Erect compact shrub to 1.6 m tall. *Branches* terete, smooth or with a few very obscure tubercles, densely pubescent with numerous short glandular hairs and longer, thin, often flexuose, white largely eglandular hairs. Leaves sessile, in whorls of 3 although often with one leaf displaced slightly further down the stem, erect, imbricate, obscuring branch, especially towards branch tips, oblong to linear-elliptic, distinctly lobed or rarely with a few entire; lobes in 1 or 2 pairs, obtuse, apex obtuse, 5.5–7 (–10.5) × 1.8–2.5 mm, surfaces faintly verrucose, shortly glandular-pubescent with longer thin weak eglandular hairs on margins and adaxial surface, pale green. *Flowers* 1 per axil, sessile. *Sepals* 5, valvate, linear-lanceolate, posterior one slightly shorter than other 4, acute, base distinctly fleshy, entire, with two rows of elongate translucent tubercles either side of midrib, 3.5–5 × 0.7–1 mm, outer surface with short glandular and longer eglandular ones, inner surface glandular-pubescent. *Corolla* 8–10 mm long, lilac to pale mauve, whitish on lower side outside and in the tube on lower side, lowermost lobe and inside of tube with irregular purple blotches; outside surface of lobes and tube eglandular pubescent, hairs slender; inside surface of upper 4 lobes glabrous, lowermost lobe prominently bearded with a dense mat of white hairs extending down the tube below it; glabrous elsewhere; tube constricted in lower part, narrow cylindrical, campanulate above; lobes obtuse. *Stamens* 4, included but upper two often extending just beyond throat, filaments white, glabrous; anthers blue, glabrous. Ovary oblong, 4-locular, with 1 ovule per locule. *Fruit* dry, ovoid to broadly ovoid, beaked, 3.5–4.5 × 2.5–3.5 mm; exocarp adhering to endocarp, densely white villous, with longer appressed eglandular hairs and short, obscure glandular ones; endocarp woody. *Seed c*. 2 × 0.7 mm, pale buff. (Figures 1, 2)

Other specimen examined. WESTERN AUSTRALIA: Koobabbie, 3 Dec. 2001, *R.J.Chinnock* 9540 (AD, PERTH).

Distribution and ecology. This species appears to be restricted to Koobabbie farm north of Moora where it has persisted in remnant degraded open *Eucalyptus* woodland of *E. salubris* (gimlet) and *E. salmonophloia* (Salmon gum) as seed presumably since 1906, when clearing commenced, until 1986 and 1991 when the areas were fenced off from livestock. Another *Eremophila* of conservation significance, *E. sargentii* (Priority Two), also occurs close to *E. koobabbiensis* at one site.

Flowering period. Although the main flowering occurs in spring during August and September, flowers occur sporadically at other times of the year.

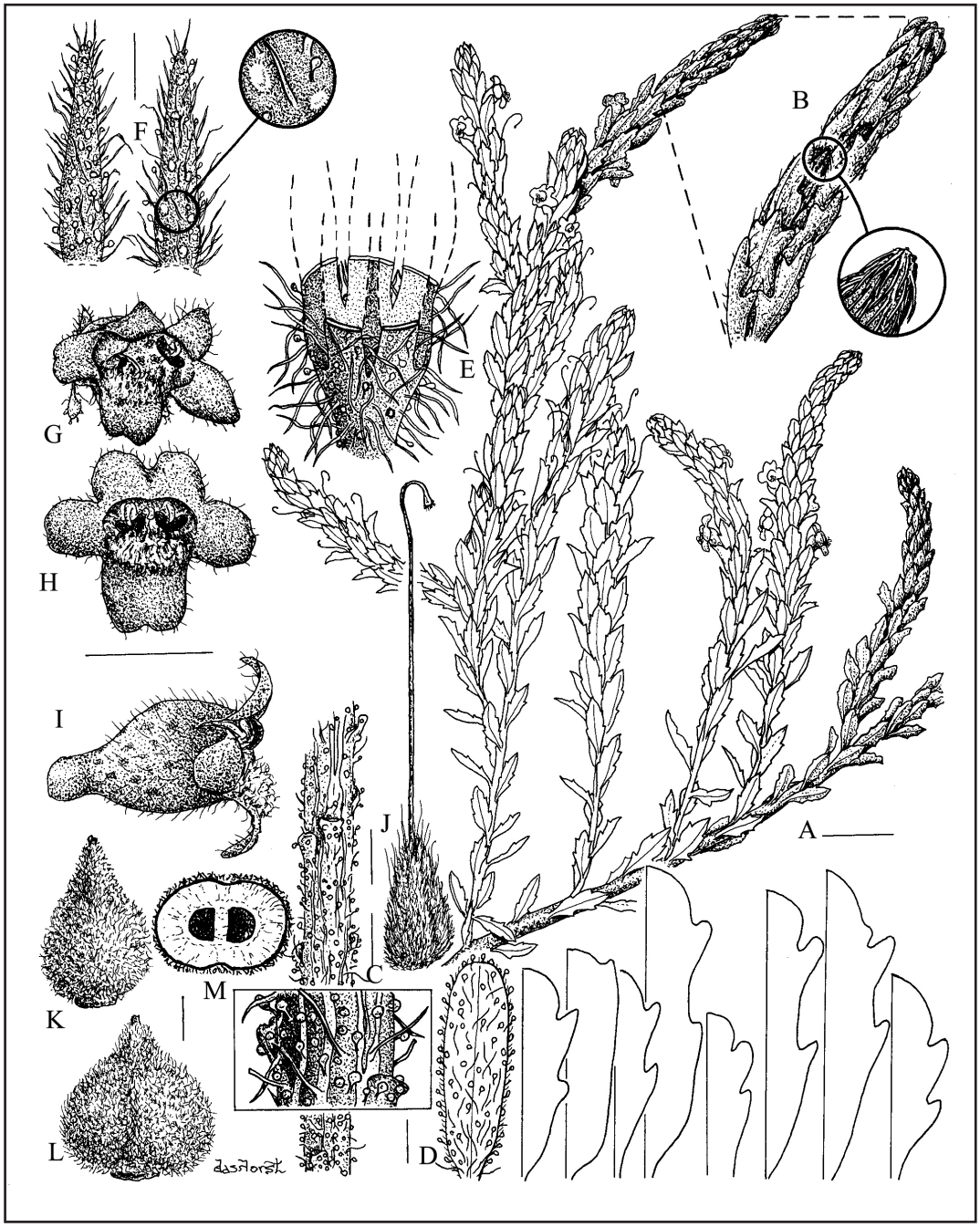

Figure 1. *Eremophila koobabbiensis*. A – branching arrangement; B – terminal portion of branch showing imbricate leaves and enlargement showing hairs; C – portion of branch with enlargement showing indumentums of long eglandular hairs and shorter glandular ones; D – leaf , with outlines showing variations in lobing and lobes restricted to the distal two thirds; E – basal portion of calyx showing valvate arrangement of sepals; F – outer and inner surface of sepal with enlargement showing glandular hairs and translucent spotting; G, H – front view of corolla; I – side view of corolla; J – gynoecium; K, L – side and front view of fruit; M – cross-section of bilocular fruit. (A–M, based on the type specimen). Scale bars: A = 5 mm; C = 1.5 mm; D = 1 mm; E, F = 1 mm; G–I = 5mm; J = 1 mm; K–M = 1 mm.

Figure 2. *Eremophila koobabiensis* (cultivated, ex *Chinnock* 9540)

Conservation status. The species is listed as *Declared Rare Flora* (Threatened) under the *Western Australian Wildlife Conservation Act 1950* and it is currently considered critically endangered.

When one of the authors (RJC) visited Koobabbie Farm in December 2001 there were seven mature plants occurring in two small populations about 3 kilometres apart, but in an interim recovery report published in 2007 (Douglas *et. al.*) only four mature plants were reported as occurring in one population. However, this is incorrect and until recently the two small populations still existed. A third natural population was located by one of us (ABD) in 2009 on Koobabbie Farm about one kilometre south-west from the population near Mamboobie road. This population consisted of at least 90 flowering plants to 0.7 m tall so they were thought to have been up to five years old. Unfortunately, this population was destroyed by rabbits later in the year after discovery through browsing and ring barking. Nevertheless this location should hold a rich seed resource in the soil and rabbit proofing of the site would be desirable to ensure any future seedling recruitment in favourable seasons would be protected.

A translocation of 74 young plants, propagated by cutting methods, occurred on Koobabbie Farm in July 2008 and currently 46 plants have established. These plants now range in height from 0.6–0.7 m.

Derivation of epithet. Taken from the farm to which this species is thought to be restricted.

Classification. *Eremophila koobabbiensis* belongs to *E*. section *Australophilae* and appears to be closest to *E. pinnatifida* Chinnock (Figure 3) which occurs further to the south-east near Dalwallinu.

The two species are well defined and readily distinguished. The terminal branches in *E. koobabbiensis* (including the appressed leaves) are of uniform width or slightly tapering towards the apices ranging from 4–5 mm broad (Figure 1B) whereas in *E. pinnatifida* they are distinctly dilated at the apices, 10–14 mm broad resulting from clustering of the developing terminal leaves (Figure 3B). The leaves of the two species are also markedly different. *Eremophila koobabbiensis* has leaves with few, usually irregularly arranged lobes which are cut into the lamina up to one third the way to the midrib. The

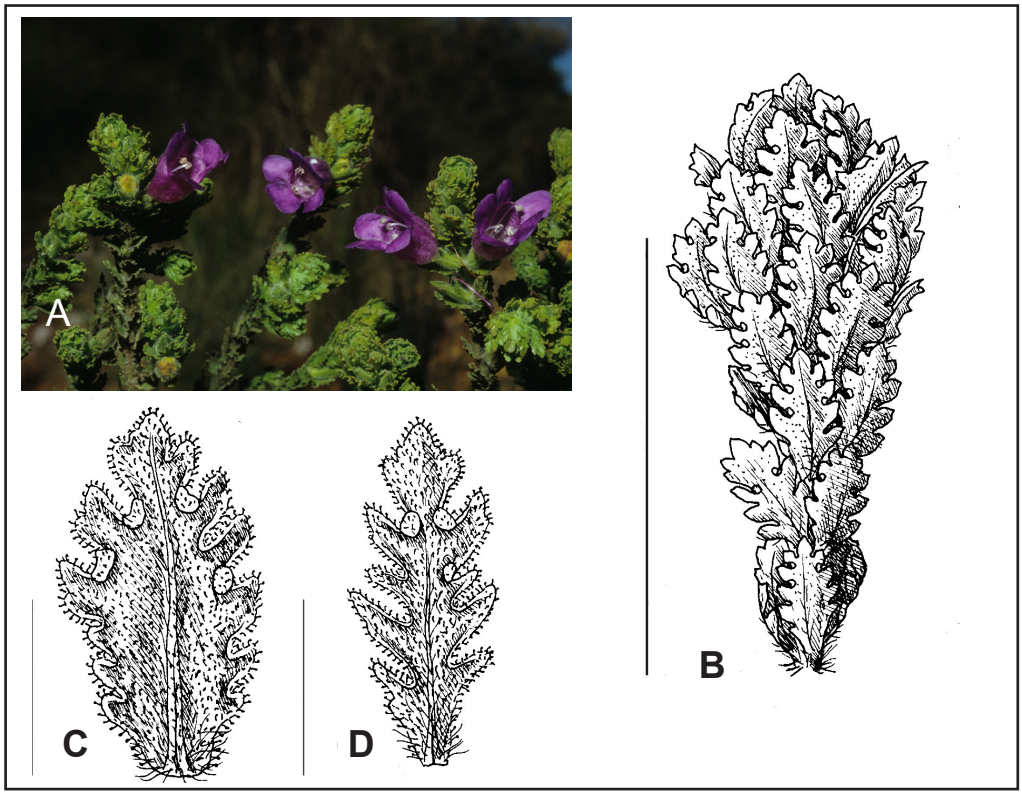

Figure 3. *Eremophila pinnatifida.* A – flowering branches **(***Chinnock* 7966); B – dilated terminal portion of branch; C, D – undersurface of leaves showing the deeply dissected lobes and raised reflexed portions of lamina at the base of the sinus between some adjacent lobes. B–D (*Chinnock* 7971). Scale bars: B = 20 mm; C = 3 mm; D = 2.5 mm.

lobes are restricted to the upper two thirds of the leaf but mostly in the distal half. Occasionally a few leaves on a branch may be entire. The leaf of *E. pinnatifida* is uniformly lobed along both margins to near the leaf base and the lobes are cut into the lamina at least half way to the leaf midrib. In addition the portion of lamina at the base of the sinus between adjacent lobes is often reflexed and distinctly raised on the lower surface (Figure 3C, D).

In the monograph (Chinnock 2007), *E. koobabbiensis* falls within the Synopsis for sect. *Australophilae* (p. 230) in Group A.

A Leaves in distinct whorls of 3–5

1. Leaves flattened: 32, *ternifolia*, 36. *densifolia*, 46. *scaberula*, 49. *pinnatifida*, 49A. *koobabbiensis*
2. Leaves subterete: 21, *chamaephila*, 31. *verticillata*, 33. *veronica*, 34. *caerulea*, 47 *sargentii*

The key to species (Chinnock 2007: 231) can be adjusted as follows:

15 Leaves distinctly lobed
Leaves deeply lobed, lobes extending to near leaf base,
consisting of 4 or more pairs; corolla 18–25 mm long, pale to dark purple ..... **49. *E. pinnatifida***

Leaves shallowly lobed, lobes scattered and mostly restricted to the distal third to
half of the leaf, consisting of 1 to 2 pairs; corolla 8–10 mm long, pale lilac to
pale purple ..... **49A. *E. koobabbiensis***

15. Leaves entire..... **16**

Note. The authors prefer Koobabbie eremophila as a common name rather than Koobabbie poverty bush. This latter name adopted in the Interim Recovery Plan by Douglas *et al.* (2007) is considered inappropriate as 'poverty bush' has normally been applied to non-palatable eremophila species in the pastoral areas that tend to increase as land becomes degraded or over-grazed.

Acknowledgements

We wish to thank Mr Gilbert Dashorst for preparing the illustration of *Eremophila koobabbiensis* and Dr Hellmut Toelken for checking the Latin.

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