

Eucalyptus merleae (Myrtaceae), a new rare species endemic to Ravensthorpe Shire in south-west Australia

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Abstract

McQuoid, N.K. & French, M.E., *Eucalyptus merleae* (Myrtaceae) a new rare species endemic to Ravensthorpe Shire in south-west Australia. *Nuytsia* 32: 151–158 (2021). *Eucalyptus merleae* McQuoid & M.E.French, first collected by Ian Brooker in 1985, is described and illustrated. It is related to *Eucalyptus astringens* Maiden. The new species has a scattered distribution in the Ravensthorpe to Hopetoun area on the central south coast of Western Australia, is at risk from frequent fire, climate change and potential mining activity, and is in need of further survey and monitoring.

Introduction

Eucalyptus merleae McQuoid & M.E.French was first collected north of Ravensthorpe by Ian Brooker in 1985 (*M.I.H. Brooker* 8804), as *E. astringens* Maiden (Brooker & Kleinig 1990). In 1995, Brooker collected from a population south of Ravensthorpe (*M.I.H. Brooker* 12200), which he determined as having affinity to *E. astringens*. Brooker later included the Ravensthorpe populations in *E. astringens* subsp. *astringens* Brooker & Hopper (Brooker & Kleinig 2001; Brooker & Hopper 2002).

Flora and vegetation surveys in the Ravensthorpe area collected and recognised the mallet described herein as *Eucalyptus merleae*, variously as *Eucalyptus astringens* (Craig pers. comm.; Craig *et al.* 2008; Hickman 2008), *E. astringens* subsp. *astringens* and *E. astringens* subsp. *redacta* Brooker & Hopper (Kern *et al.* 2008), or *E. astringens* subsp. ‘Kundip’ (McQuoid 2009). Craig *et al.* (2008), in their publication on the vegetation of the Ravensthorpe Range, stated that the ‘*E. astringens* variant’ appears to differ from both *E. astringens* subsp. *astringens* and *E. astringens* subsp. *redacta*, and may warrant recognition as a separate taxon.

Since 2008 more populations of the taxon described herein as *E. merleae* have been discovered and collected across the Ravensthorpe area (French 2012; French & Nicolle 2019; RAIN 2021). From these it has become clear that *E. merleae* inflorescences, buds and fruits are uniform and distinct from both subspecies of *E. astringens*; differences being notably longer and strongly pendulous peduncles, longer pedicels, campanulate and slightly to moderately ribbed hypanthia and fruits with ribs partially spirally arranged. Further, populations with consistently pink to red flowers have added to the uniqueness of *E. merleae* within the *E. astringens* group, and from its closest relatives that form *Eucalyptus* subser. *Pedicellatae* Blakely (Nicolle 2019). The distributions of these three taxa are distinct (Figure 1), with *E. astringens* subsp. *astringens* occurring west, north-west and north of a line from Cranbrook to west

of Lake King; *E. astringens* subsp. *redacta* south-east and east of a line from Mt Barker to north of Jerramungup including near the coast; and *E. merleae* separated to the east and restricted to an area from near Ravensthorpe to west of Hopetoun. Intergrades of *E. merleae* and *E. astringens* subsp. *redacta* occur between the distributions of these taxa (see Figure 1).

Eucalyptus merleae is part of the *Eucalyptus* subg. *Symphomyrtus* (Schauer) Brooker sect. *Glanduloseae* ms Nicolle, ser. *Erectae* Brooker subser. *Pedicellatae* Blakely (Nicolle 2019).

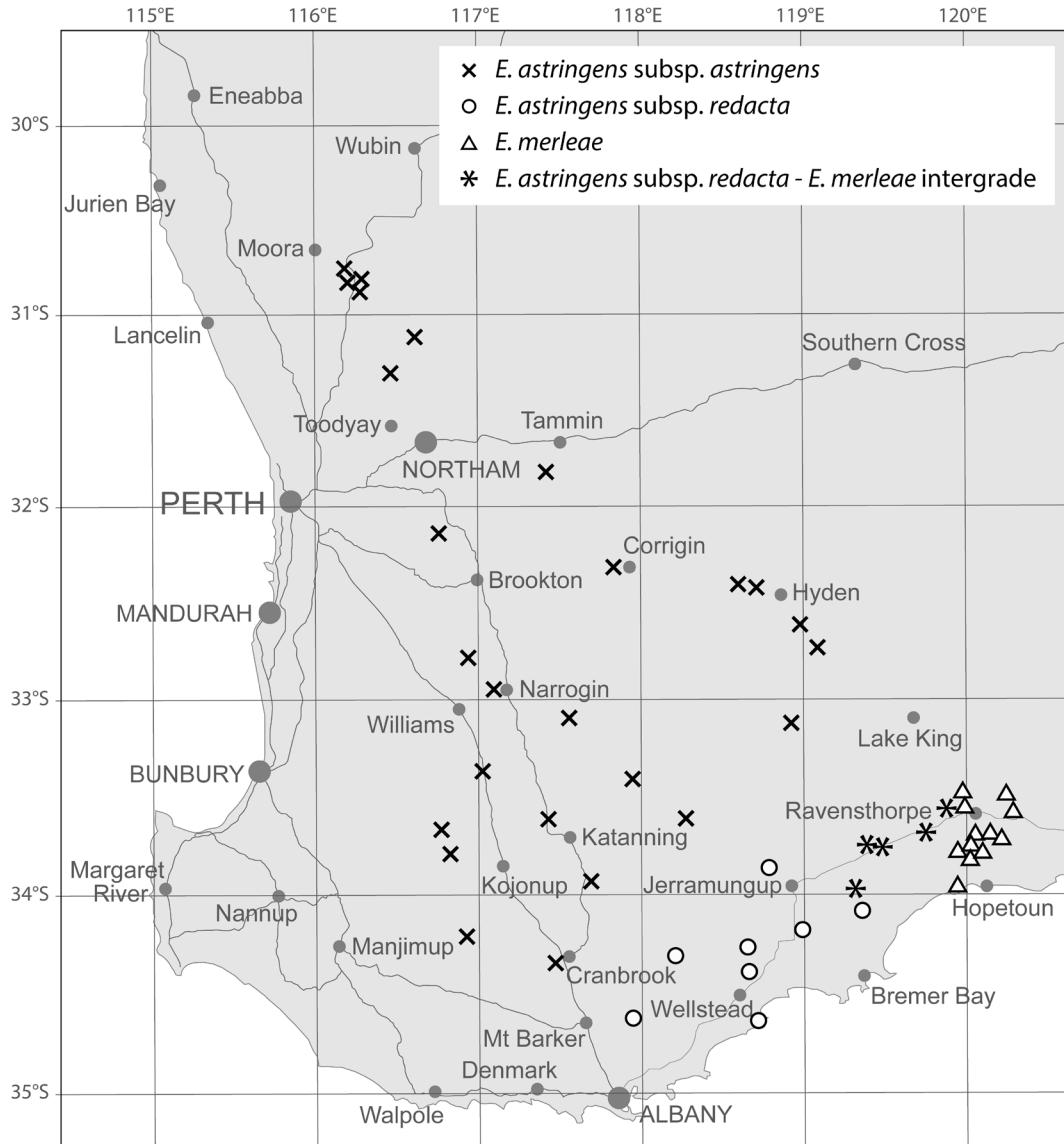


Figure 1. Distribution of *Eucalyptus merleae*, *E. astringens* subsp. *astringens*, *E. astringens* subsp. *redacta* and *E. merleae* - *E. astringens* subsp. *redacta* intergrades.

Key to closely related species from *Eucalyptus* series *Erectae* subseries *Pedicellatae* based on field habit and adult material

1. Mallee or tree, lignotuberous
2. Bark rough at base and lower trunk
3. Fruit campanulate..... **E. occidentalis**
- 3: Fruit cylindrical to broadly obconical **E. aspratilis**
- 2: Bark smooth
4. Buds and fruit prominently ribbed **E. stowardii**
- 4: Buds and fruit smooth
5. Peduncles terete
6. Erect habit to 8 m tall; adult leaves lanceolate (mean width 18 mm, maximum width 28 mm), glossy green.....**E. sporadica**
- 6: Bushy habit to 4 m tall; adult leaves narrow-lanceolate (mean width 10 mm, maximum width 15 mm), slightly glossy, grey-green to green**E. sargentii** subsp. **onesia**
- 5: Peduncles flattened
7. Buds 20–26 mm long; operculum to three times as long as hypanthium, smooth to rarely ribbed, apex apiculate to rarely blunt.....**E. diminuta**
- 7: Buds 12–20 mm long; operculum to twice as long as hypanthium, smooth, apex blunt **E. thamnoides**
- 1: Mallet, non-lignotuberous
8. Seedling leaves narrow-lanceolate; adult leaves narrow-lanceolate, rarely to 14 mm wide, slightly glossy blue-green to green; buds elongated..... **E. sargentii** subsp. **sargentii**.
- 8: Seedling leaves ovate; adult leaves lanceolate to 22 mm wide, glossy green; buds cylindrical
9. Peduncles strongly pendulous, to 30 mm long; fruit campanulate, faintly to moderately ribbed, ribbing partially spirally arranged**E. merleae**
- 9: Peduncles erect or somewhat pendulous, to 18 mm long; fruit cylindrical or obconical to slightly campanulate, smooth
10. Peduncles to 18 mm long; fruit 8–12 mm long × 7–10 mm wide **E. astringens** subsp. **astringens**
- 10: Peduncles to 15 mm long; fruit 5–9 mm long × 5–7 mm wide**E. astringens** subsp. **redacta**

Description

Eucalyptus merleae McQuoid & M.E.French, *sp. nov.*

Typus: south-west of Ravensthorpe, Western Australia [precise locality withheld for conservation reasons], 3 March 2018, *M. French* 2986 (*holo*: PERTH 09247726; *iso*: AD, CANB, MEL).

Illustrations: G. Craig *et al.*, *Vegetation of the Ravensthorpe Range, Western Australia: Mt Short to Kundip*: 101 Photo 004 (2008); M. French. *Eucalypts of Western Australia's Wheatbelt*: 91, pink to

red flower image (2012); M. French & D. Nicolle. *Eucalypts of Western Australia, the South-west Coast and Ranges*: 81, Figure 5 (2019).

Mallet erect, 6–10 m tall, without a lignotuber. *Bark* smooth, decorticating in autumn, bronze-brown. *Pith glands* present. *Cotyledons* Y shaped (bisected). *Seedling leaves* petiolate, ovate opposite for 1 to 3 pairs then alternate, dull, green. *Adult leaves* with a petiole 10–20 mm long; blade lanceolate to broad-lanceolate, 60–110 mm long, 10–22 mm wide, glossy, green; venation moderate, clear, secondary veins about 45% to the midrib, intramarginal vein remote from leaf edge, oil glands numerous, island and intersectional. *Inflorescences* axillary, unbranched, 7-flowered, peduncles flattened, conspicuously down-curved, pendulous, 10–30 mm long; pedicels terete, 5–11 mm long. *Buds* cylindrical, 15–20 mm long; hypanthium slightly ribbed, 5–10 mm long, 5–7 mm wide, swelling at top below operculum scar; operculum rarely blunt to pointed, 10–12 mm long. *Flowers* cream to pale yellow, occasionally pink or red. *Stamens* erect, ascending from narrow staminophore, bent radially then ascending, all fertile; anthers oblong, dorsifixed, opening by slits. *Style* long and straight. *Fruit* 4-locular, campanulate, faintly to moderately ribbed, ribbing usually partially spirally arranged, 8–14 mm long, 6–11 mm wide; rim thick, disc level to descending, valves 4 at rim level or slightly exserted. *Seed* grey-brown with distinct reticulum, 2–3 mm long. (Figure 2)

Diagnostic characters. Distinguished within *Eucalyptus* subser. *Pedicellatae* by the following combination of characters: mallet, obligate seeder; long pendulous peduncles; hypanthia slightly ribbed with conspicuous swelling at the top below operculum scar; rarely blunt to pointed opercula, cream or pale yellow to pink or red flower filaments; fruit consistently campanulate, faintly to moderately ribbed, with ribbing mostly partially spirally arranged.

Specimens examined of E. merleae. WESTERN AUSTRALIA [localities withheld for conservation reasons]: 8 Feb. 2004, *M. Bennett* 898 (PERTH); 18 Jan. 1985, *M.I.H. Brooker* 8804 (AD *n.v.*, CANB, MEL *n.v.*, NSW *n.v.*, PERTH); 7 Apr. 1995, *M.I.H. Brooker* 12199 W (AD *n.v.*, CANB, NSW *n.v.*, PERTH); 6 Apr. 1995, *M.I.H. Brooker* 12200 W (CANB, NSW, PERTH); 21 Nov. 1999, *G.F. Craig* GFC 5152 (PERTH); 21 Nov. 1999, *G.F. Craig* 5154 (PERTH); 21 Nov. 1999, *G.F. Craig* GFC 5155 (PERTH); 21 Nov. 1999, *G.F. Craig* GFC 5156, (PERTH); 5 Dec. 2003, *G.F. Craig* GFC 5986 (PERTH); 23 Nov. 1999, *M. French* 1106 (AD *n.v.*, PERTH); 12 Mar. 2018, *M. French* 2991 (BRI, MEL, PERTH); 12 Mar. 2018, *M. French* 2993 (CANB, PERTH); 12 Mar. 2018, *M. French* 2994 (PERTH 2 sheets); 1 Oct. 2007, *S. Kern, R. Jasper & H. Hughes* LCH 17924 (PERTH 2 sheets); 22 Jun. 2019, *N. McQuoid, R. Jasper, K. Douthie & J. Brampton* RJ 49 (NT, NSW, PERTH); 16 Oct. 2019, *D. Nicolle* 7740 (PERTH); 5 Nov. 2000, *D. Nicolle & M. French* DN 3585 (CANB, PERTH); 20 July 2001, *D. Nicolle & M. French* DN 3971 (PERTH).

Selected specimens of E. merleae – E. astringens subsp. *redacta* intergrades examined. WESTERN AUSTRALIA: 7 Apr. 1995, *M.I.H. Brooker* 12209 (AD *n.v.*, CANB, NSW *n.v.*, PERTH), 13 May 1988, *L.A.S. Johnson* 9059 & *M. Johnson* (NSW, PERTH); May 2001, *A.E. Raudino* AER 586, (PERTH), 16 Jan. 2015, *L.S.J. Sweedman* 8810 (K, PERTH).

Distribution and habitat. Occurs as almost pure stands on breakaways and slopes of Ravensthorpe Range north-west, north-east and south-east of Ravensthorpe (Figure 1). Also occurs in similar habitats on decomposing breakaways of unnamed low hills and rises south of Ravensthorpe, including a single stand west of Hopetoun in Fitzgerald River National Park. Mostly occurs in heavy mica-rich clay, usually white to pale grey and occasionally shiny pale orange to pink. Associated mallet eucalypts include *Eucalyptus cernua* Brooker & Hopper, *E. clivicola* Brooker & Hopper and *E. platypus* Hook. subsp. *platypus*.

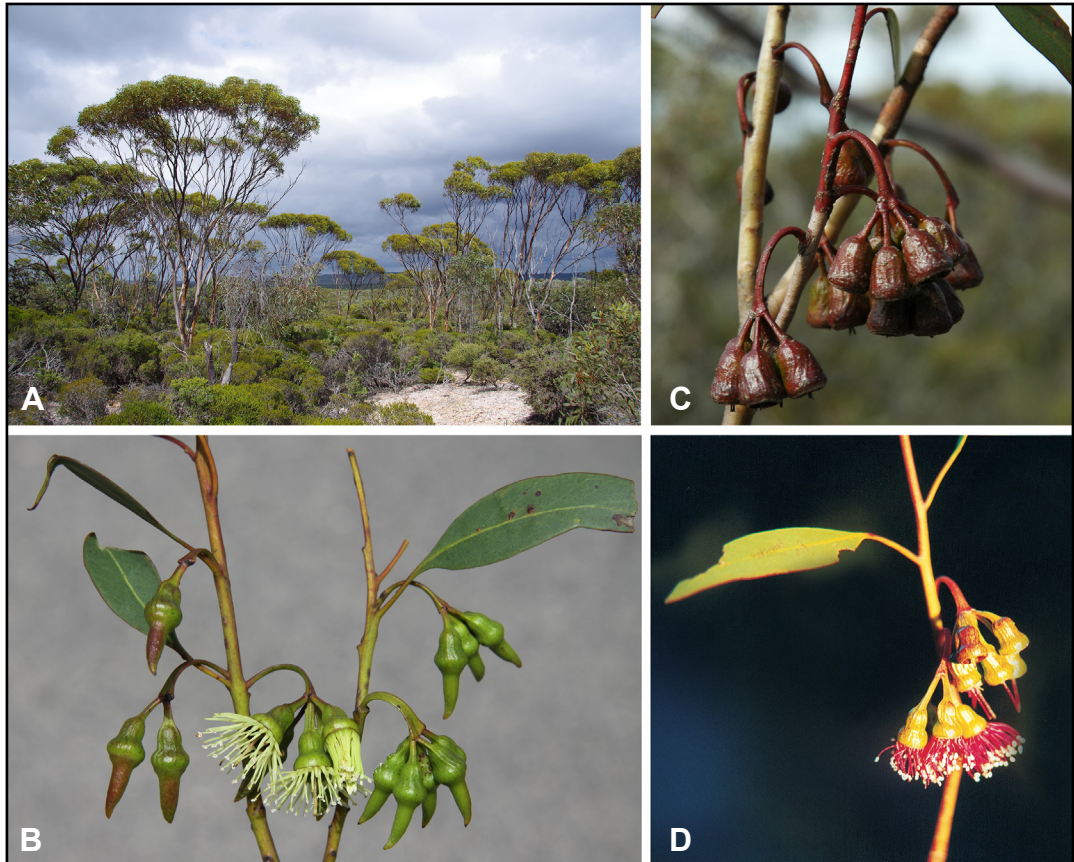


Figure 2. *Eucalyptus merleae* from south of Ravensthorpe. A – habit, showing bark, stature. Image M. French from M. French 2986; B – buds and cream flowers, showing acute opercula, and campanulate, slightly ribbed hypanthia. Image M. French from M. French 2986; C – fruit, showing downcurved pendulous peduncles, long pedicels, moderately ribbed (partially spirally arranged) campanulate hypanthia. Image N. McQuoid from N. McQuoid, R. Jasper, K. Douthie & J. Brampton RJ 49; D – pink-red flowers. Image M. French, scan of a 2004 photograph.

Flowering period. July to March.

Etymology. Named for Mrs (Violet) Merle Bennett OAM of Hopetoun WA, born 23 June 1929, for her outstanding and enduring contribution to the appreciation, celebration and exploration of the Ravensthorpe flora and landscape. Her contribution includes 50 years of observation towards understanding the diversity of the district's remarkable flora; collection of significant herbarium material (including *Eucalyptus merleae* in 2004 as cited above); discovery of new occurrences of rare plant taxa; helping community members and visitors enjoy and explore the complex and often cryptic flora; membership of conservation organisations and committees; considerate and skilful advocacy and counsel on nature conservation matters; and, longstanding and award winning involvement with the Ravensthorpe Wildflower Show and Festival.

Conservation status. To be listed as Priority Two under Conservation Codes for Western Australian Flora (C. Bourke pers. comm.). Comprises approximately twelve broadly scattered populations, mostly on unallocated Crown land over much of which mineral exploration leases and mining tenements occur; also, on road reserves, private land, and one small population in Fitzgerald River National Park. The unallocated Crown land south of Ravensthorpe, where the largest populations of *E. merleae* are

known to occur, form part of the proposed Cocanarup-Kundip Conservation Reserve. Further searches may find it between known populations.

Threats to *Eucalyptus merleae* are fire frequency intervals less than approximately 50 years, as it is a long-lived, serotinous obligate seeder (Barrett *et al.* 2009); drying trends from climate change and its potential relationships with other environmental stresses, such as altered fire regimes (Gilfillan *et al.* 2009; DEC 2012) and reduced opportunities for successful recruitment (Barrett *et al.* 2009); and clearing for mineral exploration and mining (DEC 2012). A wildfire south of Ravensthorpe in February 2020 burnt approximately 1,000 ha, including several stands of *E. merleae* and associated mallet eucalypts. Very dry conditions following have seen limited recruitment, which may impact the composition, integrity and size of the stands (RAIN 2021). Further, another wildfire in January 2021 burnt approximately 800 ha adjacent to the west of the February 2020 fire, which may have impacted stands of *E. merleae*. Monitoring to gauge recent fire impacts, seed production and recruitment patterns, and further survey to determine accurate distribution and population dimensions are recommended.

Affinities. *Eucalyptus merleae* (Figure 2) differs distinctly from its closest relative *E. astringens* (Figure 3) by its often longer (10–30 mm vs 10–18 mm long) and consistently downcurved to pendulous peduncles (*cf.* mostly erect to occasionally down-curved); pedicels 5–11 mm long (*cf.* 2–8 mm in *E. astringens*); slightly more acute opercula; buds 15–20 mm long and with a pronounced swelling below the join on the upper hypanthia (*cf.* 12–17 mm and lacking a swelling), hypanthia slightly ribbed (*cf.* smooth); flowers cream or pale yellow to pink or red (*cf.* cream to white); and consistently campanulate fruits 8–14 mm long × 6–11 mm wide (*cf.* cylindrical or obconical to slightly campanulate and 5–12 mm long × 5–10 mm wide), with faint to moderate and partially spirally arranged ribbing (*cf.* smooth). Its occasional pink or red flowers, which we know to be annually consistent in cultivation (Currency Creek Arboretum, South Australia, planted 2004), are unknown in close relatives in *E.* subser. *Pedicellatae* (Figure 2D). The partially spirally arranged fruit ribbing is otherwise unknown in the genus (Figure 2C). It also differs from *E. astringens* subsp. *astringens* by its smaller stature of 6–10 m (*cf.* to 24 m) and seed 2–3 mm long (*cf.* 1.5–2 mm).

Intergrades are known with *Eucalyptus astringens* subsp. *redacta* west of the distribution of *E. merleae* (Figure 1). These plants occur as a number of small stands that lie between the distribution of *E. astringens* subsp. *redacta* and *E. merleae*, exhibiting intermediate bud and fruit morphology.

Eucalyptus merleae is known to hybridise with *E. cernua* and *E. platypus* subsp. *platypus* south-east of Ravensthorpe, where parent plants converge (N. McQuoid pers. obs.).

Notes. The area covered by Ravensthorpe Shire is well known for its botanical diversity (Craig *et al.* 2008; Craig 2011; McQuoid 2017), including many endemic and otherwise rare taxa (Wilkins *et al.* 2011). Ravensthorpe Shire is considered to be the richest place on earth for eucalypt diversity (S. Hopper pers. comm.), a complexity that includes a number of endemic taxa: *Eucalyptus burdettiana* Blakely & Steedman, *E. cernua*, *E. coronata* C.A.Gardner, *E. desmondensis* Maiden & Blakely, *E. mcquoidii* Brooker & Hopper, *E. megacornuta* C.A.Gardner, *E. oleosa* Miq. subsp. *corvina* Johnson & Hill, *E. proxima* D.Nicolle & Brooker, *E. purpurata* D.Nicolle, *E. ravensthorpensis* Gosper ex Brooker & Hopper and *E. sepulcralis* F.Muell.

Since the recognition of two subspecies within *Eucalyptus astringens*, new discoveries and further research have improved the understanding of the distribution patterns of these two taxa (Figure 1). The known distribution of *E. astringens* subsp. *astringens* has been extended northwards in a narrow band

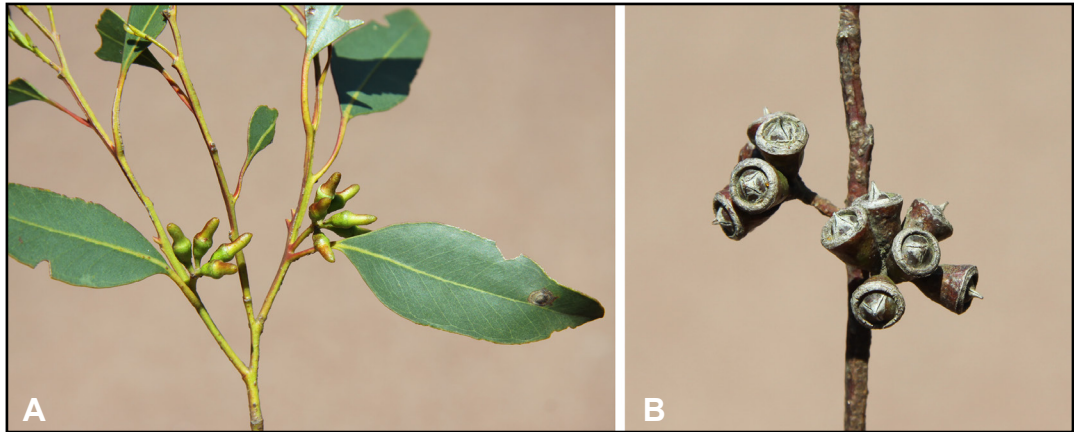


Figure 3. *Eucalyptus astringens* subsp. *redacta* from Kamballup West. A – buds, showing erect peduncles, blunt opercula, slightly campanulate hypanthia. Image M. French; B – fruit, showing erect peduncles, short pedicels, smooth obconical fruit. Image M. French.

from near Northam to the Walebing area, south-east of Moora, and eastwards from Hyden north-west to near Tammin (French 2012). *Eucalyptus astringens* subsp. *redacta* has been found to be confined to the far south, extending from west of Kamballup eastwards through the Boxwood Hill and Cape Riche area to south of Jerramungup and western Fitzgerald River National Park; it is not known to occur in the Stirling Range National Park, having previously been confused with *E. thamnoides* Brooker & Hopper in that area (French & Nicolle 2019).

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