

NEW TAXA OF *EUCALYPTUS* INFORMAL SUBGENUS *SYMPHYOMYRTUS* (MYRTACEAE), ENDEMIC TO SOUTH AUSTRALIA

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Abstract

From *E. ser. Rufispermae* Maiden, a new subspecies is recognised and described as *E. phenax* Brooker & Sleec subsp. *compressa* Nicolle distributed on Kangaroo Island and the adjacent mainland. From *E. ser. Viminales* Blakely, a new subspecies is recognised and described as *E. goniocalyx* F. Muell. ex Miq. subsp. *exposa* Nicolle distributed in the Elder and Wilpena Pound Ranges. From *E. informal sect. Adnataria* Pryor & Johnson, *E. lansdowneana* F. Muell. & J. Brown subsp. *albopurpurea* Boomsma is raised to specific rank as *E. albopurpurea* (Boomsma) Nicolle and *E. albopurpurea* and *E. lansdowneana* are described under revised circumscription. A new series, *E. ser. Vagitae* Nicolle, is described to accommodate *E. lansdowneana*. Keys are provided for South Australian taxa of *E. ser. Rufispermae* and *E. ser. Viminales* and maps are provided for *E. phenax* subsp. *compressa* and *E. nortonii* subsp. *exposa*.

Introduction

The two new subspecies and a new combination described here are not related within *Eucalyptus* other than belonging in the large and diverse *E. informal subgenus Symphyomyrtus* Pryor & Johnson (1971). All belong in different sections but share relatively restricted distributions within South Australia and have long required formal recognition.

The Kangaroo Island *E. ser. Rufispermae* taxon here described as *E. phenax* subsp. *compressa* has in the past been included in *E. conglobata* (Brooker & Kleinig, 1990), *E. phenax* (erroneously referred to as *E. anceps* R.Br. ex Maiden) (Boomsma et al., 1980; Jessop, 1993) or both (Chippendale, 1988). Neither *E. conglobata* nor *E. phenax* sens. strict. (subsp. *phenax*) is here recognised as occurring on Kangaroo Island.

The northern Flinders Ranges variant of *E. goniocalyx* has been poorly collected until relatively recently but has for some time been seen as a potentially new taxon by a few who have collected it (Brooker, pers. comm; Lang, pers. comm.). More extensive collections and survey have shown it to be a distinctive but variable taxon and it is here described as *E. goniocalyx* subsp. *exposa*.

E. lansdowneana subsp. *albopurpurea* has long been generally regarded as relatively unrelated to subsp. *lansdowneana* and worthy of specific status. Despite this, the two taxa have been continuously treated as a single species. *E. lansdowneana* subsp. *albopurpurea* is here raised to specific rank as *E. albopurpurea*. A new series (*E. ser. Vagitae*) is described to accommodate the unique and taxonomically isolated *E. lansdowneana*.

Taxonomic treatment

***Eucalyptus* ser. *Rufispermae* Maiden, *Critical Revision Genus Eucalyptus* 7: 152 (1929).**

Type: E. woodwardii Maiden.

A large series distributed from western Victoria and central New South Wales westwards to the western seaboard in Western Australia. The series is distinguished by its combination

of mallee or small tree habit; reniform cotyledons; presence of pith glands; juvenile leaves petiolate and alternating; adult leaves alternate, petiolate and concolorous; stamens inflexed and all fertile, and the glossy, red-brown seeds.

Key to South Australian taxa of *E. ser. Rufispermae*

Only a key to South Australian taxa of series *Rufispermae* is presented as many undescribed taxa of *Rufispermae* are known, mostly in Western Australia (Brooker & Hopper 1993).

1. Branchlets glaucous
 2. Bark completely smooth..... *E. cretata*
 2. Bark persistent and fibrous on lower half of stems
 3. Fruit < 9 mm diam., adult leaves predominantly lanceolate..... *E. gypsophila*
 3. Fruit > 9 mm diam., adult leaves broad-lanceolate to ovate..... *E. canescens* subsp. *canescens*
1. Branchlets not glaucous
 4. Bark persistent on lower half of stems, fibrous
 5. Fruit < 9 mm diam..... *E. gypsophila*
 5. Fruit > 9 mm diam..... *E. canescens* subsp. *beadellii*
 4. Bark smooth throughout, or ribbony-rough on lower stems (not fibrous)
 6. Mature adult leaves glossy, dark green to olive green
 7. Pedicels < 3 mm long
 8. Fruit wider than long, 7 to 12 mm wide..... *E. conglobata*
 8. Fruit equal to or longer than wide, 5 to 9 mm wide
 9. Peduncles 3 to 7 mm long, fruit longer than wide..... *E. phenax* subsp. *phenax*
 9. Peduncles 6 to 16 mm long, fruit equal in length and width..... *E. phenax* subsp. *compressa*
 7. Pedicels > 3 mm long
 10. Operculum wider than hypanthium at join, pileate, adult leaves glossy, dark green.... *E. pileata*
 10. Operculum more or less flush with hypanthium at join, pileate to conical, adult new growth dull..... *E. calcareana*
 6. Mature adult leaves dull to slightly glossy, blue-green to grey
 12. Adult leaves dull, grey, 25 to 40 mm wide..... *E. cyanophylla*
 12. Adult leaves dull to slightly glossy, blue-green, 15 to 25 mm wide
 13. Operculum wider than hypanthium at join, ribs on operculum > 0.8 mm high..... *E. percostata*
 13. Operculum more or less flush with hypanthium at join, ribs on operculum < 0.5 mm high
 - *E. dumosa*

1. *Eucalyptus phenax* Brooker & Slee subsp. *compressa* Nicolle, *subsp. nov.*

Eucalyptus phenax subsp. 'Kangaroo Island' of Nicolle, *Eucalypts S.Austr.* 1997, 96.

A subspecies typica foliis adultis crassioribus latioribus, pedunculis longioribus et lata, alabastris majoribus, pedicellis brevioribus et fructibus majoribus differt.

Distinguished from *E. phenax* subsp. *phenax* by the broader, thicker adult leaves; longer, thicker peduncles; buds lacking pedicels and fruit about equal in length to width.

Distinguished from *E. conglobata* by the prominent, long peduncles and smaller adult leaves, buds and fruits and fruit that are about equal in length and width.

Typus: South Australia: Kangaroo Island Region: Playford Highway, 1.1 km south-west of junction of road to Emu Bay, Kangaroo Island, 9.iii.1977, P. J. Lang 733 (holo: AD; iso AD)

Mallee, often robust and erect in habit, 3 to 9 metres tall. *Bark* rough, ribbony, tan to grey bark at the base or to about 2 metres, then smooth light grey to grey over grey to tan bark above, decorticating in ribbons. Forming *lignotubers*. Pith glands present. *Cotyledons* reniform. Seedling leaves opposite for about three pairs then alternating, petiolate, (ovate to) broad-lanceolate, to 45 mm long × 20 mm wide, discolorous, glossy, green. *Adult leaves*

alternating, petiolate, lanceolate to broad-lanceolate, 60–140 mm long × 14–30 mm wide, concolorous, glossy, slightly blue-green at first, soon becoming green to dark green; reticulation dense but broken, oil glands abundant, at intersections of veinlets, lateral veins at 35° to 55° from midrib. *Inflorescences* axillary, unbranched, 7-flowered; peduncles thick, flattened and widening towards summit, 8–16 mm long; pedicels absent or to 1 mm long. *Buds* ovoid to clavate, 9–11 mm long × 4–6 mm diam., operculum conical to slightly beaked, apiculate or rounded, striated to ribbed, scar present. *Stamens* strongly inflexed, all fertile; anthers versatile, oblong, opening by longitudinal slits. *Flowers* white. *Ovules* in 4 vertical rows. *Fruits* sessile and very crowded, cupular to hemispherical, 6–8 mm long × 6–9 mm diam., smooth or angular, especially towards base of hypanthium; disc descending; valves 3–5, at about rim level. *Seed* compressed-ovoid, glossy, bright red to red-brown, finely reticulate; chaff red-brown.

Etymology. From the Latin *compressus* - pressed together, referring to the crowded fruit umbellasters compared to the type subspecies.

Selected specimens (West to east)

SOUTH AUSTRALIA: Kangaroo Island Region: Playford HW, between Ropers Rd and Birchmore Rd, Kangaroo Island, 35°43'38"S, 137°28'04"E, 25.ix.1994, *D. Nicolle 1054* (AD, CANB); Cnr of Playford HW and Arranmore Rd, Kangaroo Island, 35°42'32"S, 137°30'45"E, 30.iv.1994, *D. Nicolle 824* (AD); North Coast Rd, between Gap Rd and Grid Iron Cnr, Kangaroo Island, 35°37'34"S, 137°31'35"E, 30.iv.1994, *D. Nicolle 821* (AD); Three-chain Rd, between Marapana Rd and Hundred Line Rd, Kangaroo Island, 35°53'54"S, 137°33'05"E, 24.ix.1994, *D. Nicolle 1045* (AD); Bay of Shoals, on roadside 4.0 km north east of bitumen road to Wisanger, ca 100 m from coast, Kangaroo Island, 5.iii.1977, *P.J. Lang 680* (AD); Playford Highway, 1.1 km south west of junction of road to Emu Bay, Kangaroo Island, 9.iii.1977, *P.J. Lang 732, 734, 735, 736* (AD); Near Kingscote, Kangaroo Island, 35°35'S, 137°40'E, 10.iv.1948, *C. Boomsma s.n.* (AD); 16 km south west of American River on road linking American River with Boundary Road. (At Junction with road heading north west past "Salt Lagoon"), Kangaroo Island, 6.iii.1977, *P.J. Lang 686, 688* (AD); North west of American River on road to Red Banks, 0.8 km north west of road linking Point Morrison to Birchmoor Highway, Kangaroo Island, 5.iii.1977, *P.J. Lang 666, 667, 668, 669, 670* (AD). 1.6 km north west of Chapman River on road from Penneshaw to Cape Willoughby, Kangaroo Island, 4.iii.1977, *P.J. Lang 652, 653, 656* (AD); Dudley Peninsula, Kangaroo Island, 35°46'53"S, 138°03'23"E, 25.ix.1994, *D. Nicolle 1058* (AD, CANB); 0.5 km along Wilson River Road from junction with Cape Willoughby Road, Kangaroo Island, 4.iii.1977, *P.J. Lang 659, 660, 661* (AD). Southern Lofty Region: Mount Scrub Rd, Fleurieu Peninsula, SA, 35°35'55"S, 138°26'27"E, 28.v.1995, *D. Nicolle 1358* (AD, CANB, PERTH); Near "Balbara Stud", 0.5 km east north east [of] ford on Coolawang Creek on road from Mt. Scrub to Mt. Desert, 35°36'S, 138°26'E, 19.iii.1977, *P.J. Lang 750, 751, 753* (AD); East of Callowonga Hill, west of Victor Harbor, SA, 25.vii.1992, *D. Nicolle 77* (CANB); Mount Scrub Rd, Fleurieu Peninsula, SA, 35°36' 07"S, 138°24'57"E, 28.v.1995, *D. Nicolle 1359* (AD).

Distribution and habitat

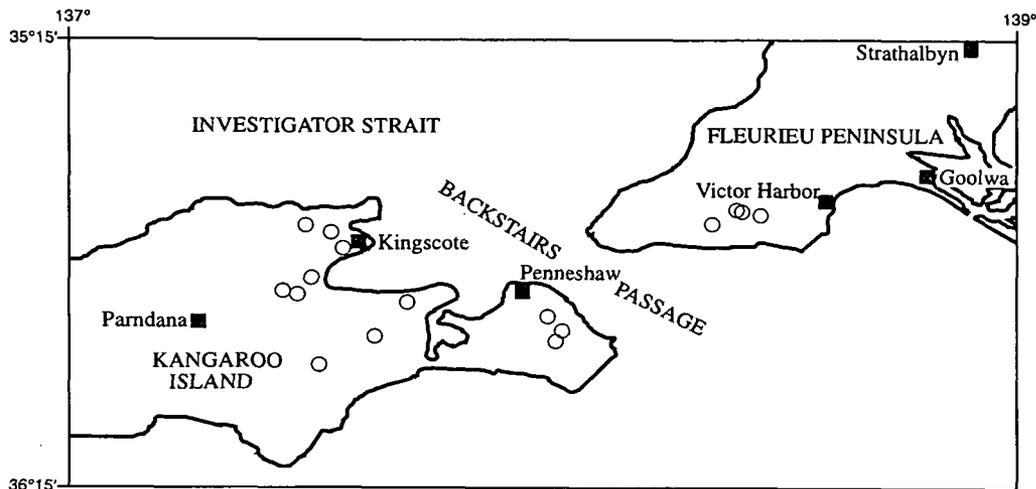
Common on northern and eastern Kangaroo Island, extending to southern Fleurieu Peninsula in hilly sites around Waitpinga. It occurs in mallee vegetation on Kangaroo Island with *E. cneorifolia*, *E. diversifolia* (subsp. *diversifolia*) and *E. fasciculosa*, mostly in loams, or with *E. odorata*, *E. fasciculosa*, *E. cneorifolia*, *E. obliqua*, *E. cosmophylla* and *E. leptophylla* on the adjacent mainland in gravelly clays to loams. Map 1.

Flowering period: Spasmodic, but usually from September to January.

Notes

This taxon is distinguishable from *E. phenax* subsp. *phenax* and *E. conglobata* in the thick, flattened, long peduncles. It is somewhat intermediate in bud and fruit morphology between the two species. With the circumscription of *E. phenax* subsp. *compressa*, the most easterly known locality for *E. conglobata* is in Lincoln National Park, close to the type locality, and the adjacent Taylor Island. *E. phenax* subsp. *compressa* is the only taxon in *E. ser. Rufispermae* known from Kangaroo Island. Integradation between *E. phenax* subsp. *phenax* and *compressa* occurs commonly where their distributions overlap in an area from

around Goolwa to north-east of Finniss. Hybrids are known with *E. rugosa* on Kangaroo Island, the only other species known on the island of the informal *E. sect. Dumaria* (Pryor & Johnson, 1971). Hybrids between *E. phenax* subsp. *phenax* - *compressa* intergrades and *E. odorata* are known north of Goolwa (e.g. D. Nicolle 1360).



Map 1. Distribution of *Eucalyptus phenax* subsp. *compressa* (O).

Conservation status

Poorly conserved both on Kangaroo Island and Fleurieu Peninsula, mostly occurring as remnants along roadsides. Not known to occur in any conservation reserves. The conservation code 2R is recommended using the criteria of Briggs & Leigh (1996).

Taxon	<i>E. conglobata</i>	<i>E. phenax</i> subsp. <i>compressa</i>	<i>E. phenax</i> subsp. <i>phenax</i>
Distribution	Lower EP and adjacent islands in S.Aust. and south coast of W.Aust.	North-eastern Kangaroo I. and adjacent mainland. S.Australian endemic.	Widespread in W.Aust., S.Aust. and into Vic., more inland than other two taxa.
Habit	Mallee or rarely slender tree.	Mallee, often erect in habit.	Mallee.
Bark	Smooth, ribbony towards base.	Smooth, ribbony towards base.	Smooth, sometimes ribbony towards base.
Adult leaves	Lanceolate to broad-lanceolate.	Lanceolate to broad-lanceolate (up to 30 mm wide).	Lanceolate.
Peduncles	Absent to 6 mm long.	6-16 mm long.	3-7 mm long.
Pedicels	Absent.	Absent to 1 mm long.	Absent to 3 mm long.
Bud size	6-12 mm long by 5-9 mm wide.	6-11 mm long by 4-6 mm wide.	5-8 mm long by 3-6 mm wide.
Fruit size	4-7 mm long by 7-12 mm wide. Wider than long, average ratio 1:1.8.	6-8 mm long by 6-9 mm wide. Width and length about equal, average ratio 1:1.	6-8 mm long by 5-8 mm wide. Longer than wide, average ratio 1:0.8.

Table 1. Differentiating characters between *E. conglobata* and *E. phenax* subsp. *phenax* and *compressa*

Eucalyptus ser. *Viminalis* Blakely, *Key Eucalypts* 37, 160 (1934).

Type: *E. viminalis* Labill.

A large series restricted to the eastern States as far north as near Brisbane in Queensland and extending westwards as far as Port Lincoln on Eyre Peninsula in South Australia (*E. viminalis* subsp. *cygnetensis*). The series is distinguished by the combination of bilobed cotyledons; sessile and opposite juvenile leaves; lack of pith glands; one to seven-flowered inflorescences and inflexed or irregularly flexed stamens.

Key to South Australian taxa of *E. ser. Viminalis*

1. Inflorescences predominantly three-flowered
 2. Fruit glaucous, > 12 mm diameter ***E. bicostata***
 2. Fruit not glaucous, < 12 mm diameter
 3. Bark rough on trunk and large branches ***E. viminalis* subsp. *cygnetensis***
 3. Bark smooth, some rough bark may be present for up to 2 metres only
 4. Juvenile leaves lanceolate, green ***E. viminalis* subsp. *viminalis***
 4. Juvenile leaves orbicular, bluish ***E. dalrympleana* subsp. *dalrympleana***
1. Inflorescences predominantly seven-flowered
 5. Buds and fruits pedicellate ***E. viminalis* subsp. *cygnetensis***
 5. Buds and fruits sessile
 6. Bud hypanthium not angular ***E. splendens* subsp. *arcana***
 6. Bud hypanthium angular towards base
 7. Adult leaves glossy, dark green; branchlets never pruinose ***E. goniocalyx* subsp. *goniocalyx***
 7. Adult leaves dull, green to bluish; branchlets often slightly pruinose ***E. goniocalyx* subsp. *exposa***

2. *Eucalyptus goniocalyx* F. Muell. ex Miq. subsp. *exposa* Nicolle, *subsp. nov.*

A subspecies typica statura parvior "mallee", cortice deciduo vel aliquantum persistenti, foliis juvenilibus minoribus et internodiis brevioribus, foliis adultis minoribus hebetibusque, ramulis alabastris fructibusque glaucescentibus differt.

Distinguished from subsp. *goniocalyx* in the mallee habit, less extensive or absence of rough bark, smaller juvenile leaves with shorter internodes, smaller and duller adult leaves and the variably pruinose branchlets, buds and fruits.

Typus: South Australia: Flinders Ranges Region: Tanderra Saddle, Wilpena Pound Range, SA, 21.vi.1997, *D. Nicolle* 1997 (holo: AD; iso: CANB, NSW, PERTH).

Mallee 3 to 6 m tall. *Bark* variable, depending on the size of the plant, completely smooth on smaller mallees, ribbony, dark grey to grey over cream to white, becoming glaucous towards branchlets; larger mallees with some rough, thin, dark grey to grey box-type bark for 1–2 metres then smooth above. Forming lignotubers. *Branchlets* very weakly to strongly glaucous; pith glands absent. *Cotyledons* bilobed. *Seedling* leaves opposite, sessile for numerous pairs, orbicular, 14–30 mm long × 14–34 mm wide, discolorous, dull, glaucous, grey-green to grey, seedling stems slightly square in transverse section, slightly warty, nodes 15–25 mm apart. *Adult leaves* alternating, petiolate, lanceolate to falcate, 75–160 mm long × 14–21 mm wide, concolorous, dull to slightly glossy, (light green to) bluish; reticulation moderate, with scattered island and intersectional oil glands, lateral veins at 45° to 60° from midrib. *Inflorescences* axillary, unbranched, 7-flowered; peduncles slightly to prominently flattened, 5–8 mm long; pedicels absent. *Buds* ovoid, 7–11 mm long × 2.5–3.5 mm diam., often glaucous, hypanthium often slightly angular, operculum equal to or slightly wider than hypanthium, conical, apiculate. *Stamens* variously flexed, all fertile; anthers versatile, oblong, opening by longitudinal slits. *Flowers* white. *Ovules* in 4 vertical rows. *Fruits* sessile, cupular to slightly campanulate, smooth, often glaucous, 6–8 mm long × 6–8 mm diam.; operculum scar very narrow, ascending; disc slightly descending to

slightly ascending, valves 3 or 4 slightly below rim level to slightly exerted. *Seed* compressed-ovoid, 1.2–2.0 mm long, slightly glossy, dark grey-brown to black, with a finely pitted reticulum; chaff glossy, reddish.

Etymology

The epithet is from the English *exposed* and the name has two intended meanings, the first referring to its exposed habitat on high altitude peaks and the second referring to the fact that until recently this taxon has been largely uncollected by botanists.

Selected specimens (North to south)

SOUTH AUSTRALIA: Flinders Ranges Region: Summit of Mount Mary (sic), Wilpena Pound, 25.vi.1978, *A. Robinson s.n.* (AD); Tanderra Saddle, Wilpena Range (sic), 24.v.1986, *M.I.H. Brooker 9305, 9306, 9307* (AD, CANB); Tanderra Saddle, south-east of St. Mary Peak, Wilpena Pound, Flinders Ranges, 22.ix.1973, *A.J.A. Sikkes & P. Ollerenshaw 739, 740* (AD); Wilpena, Flinders Ranges, x.1958, *M.I.H. Brooker s.n.* (AD); Near top of Point Bonney, Wilpena Pound Range, altitude 1100 m, 12.vi.1992, *D. Nicolle 439* (AD); Near top of Point Bonney, Wilpena Pound Range, altitude 1100 m, (Juveniles), 12.vi.1992, *D. Nicolle 440* (AD, CANB); Top of Illuka Hill, Wilpena Pound Range, altitude 1050 m, 12.vi.1992, *D. Nicolle 441* (AD); Wilpena Pound, Moonarie Gap, (rock climbing area) 13°36' S, 138°37' E, 2.xi.1985, *P.J. Lang 8793, 8794, 8795* (AD); Mt Aleck, 100 m north of summit, Elder Range, 13.xi.1993, *D. Nicolle 565* (AD); Summit of Mt Aleck, Elder Range, 13.xi.1993, *D. Nicolle 563* (AD).

Distribution

Known only from the Elder Range and Wilpena Pound Range in the northern Flinders Ranges of South Australia. It occurs on the upper slopes and summit of peaks above about 1000 metres altitude such as Mt Aleck in the Elder Range and Point Bonney and St Mary Peak in the Wilpena Pound Range. It is the dominant eucalypt on the summit of these peaks, often associated with *E. flindersii* and *Xanthorrhoea quadrangulata*. Further down slope, *E. flindersii* or *E. affinity viridis* become the dominant eucalypt species.

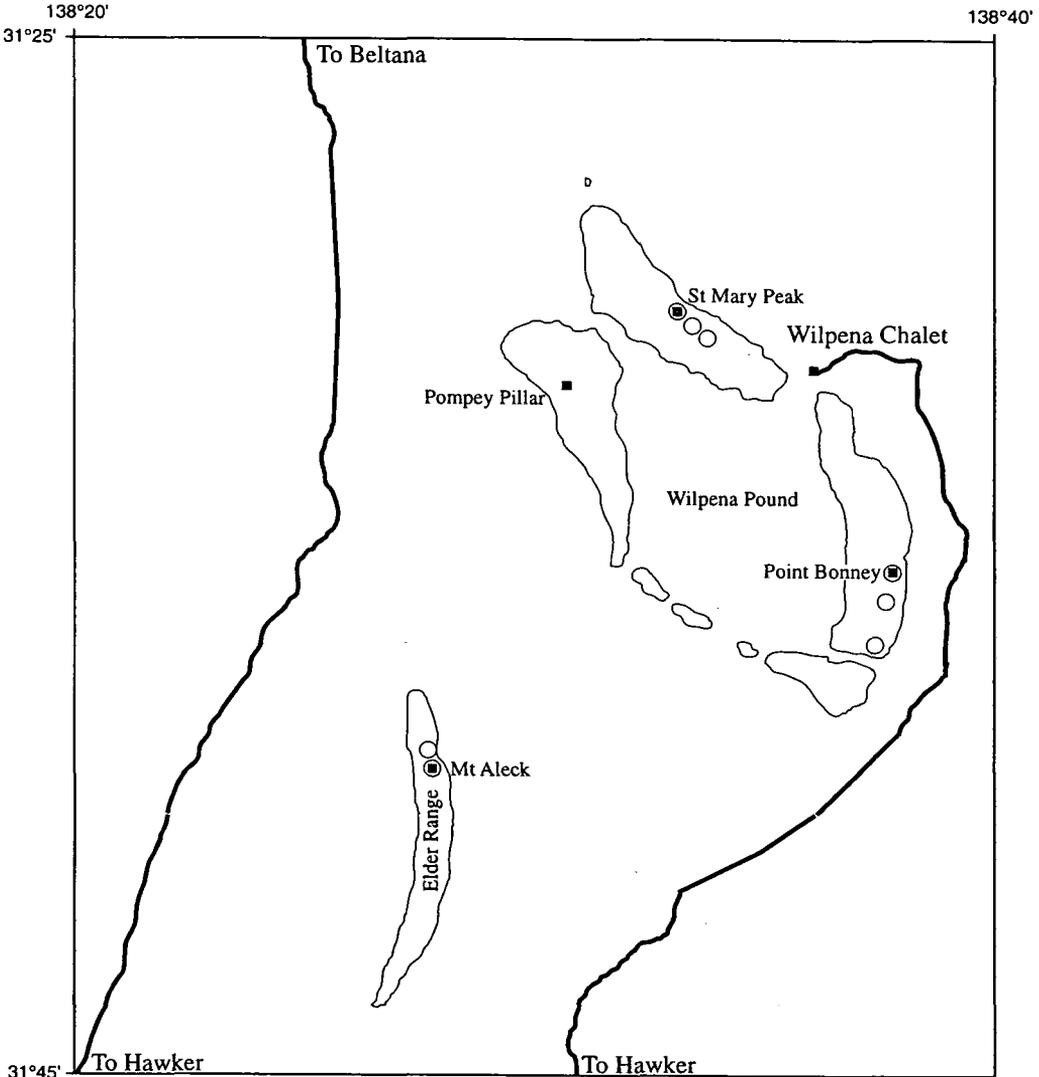
Flowering period: Not known.

Notes

E. goniocalyx subsp. *exposa* is distinguishable from subsp. *goniocalyx* by the mallee habit, less extensive or absence of rough bark, smaller juvenile leaves with shorter internodes, smaller and duller adult leaves and the variably pruinose branchlets, buds and fruits. *E. goniocalyx* subsp. *exposa* is somewhat variable in pruinosity and adult leaf colour, however, the adult leaves are never the glossy, green colour characteristic of subsp. *goniocalyx*. The geographically nearest known populations of *E. goniocalyx* subsp. *goniocalyx* to subsp. *exposa* in South Australia are on and around Mt Brown east of Port Augusta in the southern Flinders Ranges. Here, as with subsp. *goniocalyx* elsewhere, they form trees displaying no pruinosity and with adult leaves that are glossy and dark green. In morphology, *E. goniocalyx* subsp. *exposa* also approaches *E. nortonii* (an endemic to New South Wales and Victoria) but the former can be distinguished from the latter by the mallee habit, less extensive rough bark, more variable but usually weaker pruinosity, the smaller, more crowded juvenile leaves with shorter internodes, the much smaller, greener adult leaves and the usually smaller buds and fruits. The geographically nearest populations of *E. nortonii* to *E. goniocalyx* subsp. *exposa* are around Maryborough in Victoria, over 500 km away where they occur at relatively low altitudes in undulating hills. In some characters *E. goniocalyx* subsp. *exposa* is intermediate between subsp. *goniocalyx* and *E. nortonii*, but it is most probable that *E. goniocalyx* subsp. *exposa* evolved from the geographically much nearer subsp. *goniocalyx*.

Conservation status

The populations are small and restricted, however they occur in inaccessible terrain and the taxon is sometimes dominant where it occurs. The Wilpena Pound populations are conserved within the Flinders Ranges National Park, and the Elder Range populations are unconserved. Plants recover vigorously in the event of a fire. The conservation status 2RCa is recommended using criteria of Briggs and Leigh (1996).



Map 2. Distribution of *Eucalyptus gonicalyx* subsp. *exposita* (O) showing 750 metre contours.

***Eucalyptus* informal sect. *Adnataria* Pryor & Johnson, *A Classification of the Eucalypts* (1971).**

This section is predominantly distributed in eastern Australia and includes all the eucalypts commonly known as 'boxes' and 'ironbarks'. The section is composed of many series, most of which are poorly defined, and the section as a whole is considered

taxonomically difficult. Chippendale (1988) included *E. lansdowneana* (with subspp. *lansdowneana* and *albopurpurea*) in *E. ser. Porantheroideae* (Maiden) Chippendale, along with *E. petraea*, *E. thozetiana* and the type of the series, *E. ochrophloia*. *E. ser. Porantheroideae* is here taken to include only *E. ochrophloia* and *E. thozetiana*. *E. petraea* is considered more accurately placed in *E. ser. Lucasianae* Chippendale. *E. lansdowneana* subspp. *albopurpurea* is here raised to specific status and included in *E. ser. Subbuxales* closest to *E. odorata* while the typical form of *E. lansdowneana* is considered taxonomically isolated within the section and a new monotypic series is erected to accommodate it.

Eucalyptus ser. Subbuxales Blakely, *Key Eucalypts* 54, 233 (1934).

Type: E. odorata Behr.

A poorly defined series, composed of a number of taxonomically difficult taxa. *E. albopurpurea* is best placed in *E. ser. Subbuxales*, its closest relative being that of the type species, *E. odorata*.

3. Eucalyptus albopurpurea (Boomsma) Nicolle, *stat. et comb. nov.*

Eucalyptus lansdowneana F. Muell. and J. E. Brown subsp. *albopurpurea* Boomsma, *S. Austral. Naturalist* 48: 55 (1974): **Basionym**

Type: South Australia, 4 km E of Kellidie Bay, 34°40'S, 135°30' E, 2.vii.1973, *R.A. Dorward s.n.* (holo: AD; iso: AD, CANB).

Eucalyptus behriana var. *purpurascens* F. Muell. ex Benth., *Fl. Australia* 3: 214 (1967); *Eucalyptus hemiphloia* var. *purpurascens* (F. Muell. ex Benth.) Maiden, *Trans. & Proc. Roy. Soc. S. Australia* 26: 12 (1902); *Eucalyptus odorata* var. *purpurascens* (F. Muell. ex Benth.) Maiden, *Trans. & Proc. Roy. Soc. S. Australia* 32: 283 (1908).

Type: Lake Wangarry, S.A., *C. Wilhelmi s.n.* (iso: MEL).

Eucalyptus lansdowneana var. *leucantha* Blakely, *Key Eucalypts* 224 (1934).

Type: South Australia, between Kirton Point and Port Lincoln, -.i.1907, *J.H. Maiden s.n.* (holo: NSW).

Mallee or less commonly a tree 5 to 18 m tall. *Bark* rough at base or for up to 2.5 metres, loose, grey-brown, becoming ribbony then smooth thereafter, grey or olive-grey over coppery or pinkish-tan, decorticating in strips. Forming *lignotubers*. *Branchlets* with pith glands present only at nodes. *Cotyledons* reniform. *Seedling leaves* opposite for 2 or 3 pairs then alternating, petiolate, ovate, 35–60 mm long × 23–35 mm wide, discolourous, dull, green. *Adult leaves* alternating, petiolate, (ovate to) broad-lanceolate (to lanceolate), 70–130 mm long × 22–35 mm wide, concolorous, glossy, green; reticulation dense but broken, oil glands scattered, mostly intersectional, lateral veins at 35° to 55° from midrib. *Inflorescences* axillary or appearing terminal through abortion of terminal leaf shoots, unbranched, 7- to 11-flowered; peduncles slightly flattened to terete, 10–14 mm long; pedicels 0.1–3 mm long. *Buds* fusiform to clavate, 7–11 mm long × 3–5 mm diam., hypanthium smooth or angled towards base, operculum equal in width to hypanthium, smooth, conical, apiculate; both opercula held until flowering. *Stamens* variously flexed, all fertile; anthers adnate, basifixed, globoid, opening by lateral pores, white to pink to purple. *Ovules* in 4 vertical rows. *Fruits* pedicellate, barrel-shaped to cupular, smooth, angular towards base of hypanthium, 6–11 mm long × 5–9 mm diam.; operculum scar to 1 mm wide, ascending or almost level; disc descending, valves 3 or 4 enclosed or to rim level. *Seed* compressed-ovoid, 1.0–1.5 mm long, dull, brown to brown-grey, with a fine to moderately pitted reticulum; chaff slightly glossy, orange brown.

Distinguished from *E. lansdowneana*, as now circumscribed, by the larger and more robust habit; non-pendulous crown; broad-lanceolate, dark green adult leaves which are often dull when immature; usually smaller buds and fruits; white, pink or purple staminal filaments that are all fertile, and the coastal habitat.

Other specimens examined (West to east)

SOUTH AUSTRALIA: Eyre Peninsula Region: Kellidie Bay Conservation Park, NW corner, 1.9 km N along road to Wangarry from the Coffin Bay - Port Lincoln road intersection, 17.ix.1983, *J.D. Briggs 1197* (AD, NSW, CANB); 34°48'27"S, 135°45'45"E, (Just north of Sleaford Mere, south-west of Port Lincoln), 16.xii.1995, *D. Nicolle 1609* (AD); 34°50'23"S, 135°41'54"E, (West of Sleaford Mere, south-west of Port Lincoln), 17.vii.1994, *D. Nicolle 942* (AD); 34°50' 43"S, 135°43' 36"E, (West of Sleaford Mere, south west of Port Lincoln), 17.vii.1994, *D. Nicolle 940* (AD); Fishery Bay - coastal cliff top, 22.x.1977, *P.J. Lang 1120* (AD). Kangaroo Island Region: 15 km N of Cape de Couedic, 7.ii.1981, *M.D. Crisp 595* (AD); 3 km E of Seal Bay, 6.iii.1977, *P.J. Lang 695* (AD); 35°58'35"S, 137°12'02"E, (South Coast Road, just north-east of Vivonne Bay, K.I.), 29.iv.1994, *D. Nicolle 802* (AD); 1 km NE Eleanor Station on South Coast Road, 20.vii.1975, *G. Chippendale 1363* & *M.J. Brennan s.n.* (AD); 35°49'54"S, 137°42'08"E, (Three Chain Road, south-west of American River, K.I.), 29.iv.1994, *D. Nicolle 793* (AD); 35°49'56"S, 137°57'31"E, (Near Wilson River Homestead on Wilson River, K.I.), 25.ix.1994, *D. Nicolle 1060* (AD).

Distribution

E. albopurpurea is endemic to South Australia, known only from Kangaroo Island and the southern tip of Eyre Peninsula. It is a coastal taxon, sometimes occurring within a few metres of the high tide water level on sandhills, for example with *E. diversifolia* on the south coast of Kangaroo Island. It appears to be tolerant of saline soils indicated by mallees of this species growing naturally on the edge of Sleaford Mere on Eyre Peninsula. *E. albopurpurea* grows in areas of slightly higher rainfall than the closely related *E. odorata* (500-650 mm annually; 300-600 mm for *E. odorata*). *E. albopurpurea* is often associated with a variety of mallee and coastal woodland species such as *E. rugosa*, *E. diversifolia*, *E. incrassata* var. *angulosa*, *E. cneorifolia*, *E. leucoxyton*, *E. cosmophylla*, *E. leptophylla*, *E. fasciculosa*, *E. odorata*, *E. oleosa* and *E. cladocalyx*.

Flowering period: March to October.

Notes

E. albopurpurea is most closely related to *E. odorata*, with a much more distant relationship to *E. lansdowneana*, a whipstick mallee restricted to a few small populations in the western part of the Gawler Ranges. *E. albopurpurea* and *E. lansdowneana* are allopatric, occurring over 250 kilometres apart in vastly different habitats. *E. albopurpurea* and *E. odorata* intergrade on central-eastern Kangaroo Island where their distributions overlap, and possibly also in the Wanilla area of Eyre Peninsula. *E. albopurpurea* is therefore best placed in *E. ser. Subbuxaeales* Blakely nearest *E. odorata*. Plants of *E. albopurpurea* on Eyre Peninsula are generally lower growing with a more straggly habit compared to plants on Kangaroo Island which sometimes attain tree proportions, and Eyre Peninsula plants more often have coloured filaments (pink to purple) whereas Kangaroo Island plants usually have white filaments or more rarely coloured filaments. The adult leaves of the Kangaroo Island plants also remain dull in the crown for longer before becoming glossy. These slight differences are not considered to warrant taxonomic distinction.

Conservation status

Common and well conserved, occurring within Flinders Chase National Park and Kelly Hill, Vivonne Bay, Seal Bay and Cape Gantheaume Conservation Parks on Kangaroo Island and Lincoln and Coffin Bay National Parks on Eyre Peninsula.

Eucalyptus ser. Vagitae Nicolle, *ser. nov.*

Frutices "mallees", ramuli flexuosi, penduli. Cortex interdum fibrosus basin versus vel omnino laevis, taeniis decorticantibus. Lignotuberum formans. Cotyledones reniformes. Medulla non glandulifera. Folia juvenilia petiolata, remanentia opposita per nodos paucos, tum alternantia, ovata ad late lanceolata, discoloria, hebetia, viridia. Folia adulta petiolata, alternantia, lanceolata vel falcata, concoloria, valde nitentia, flavido-viridia ad

viridia, glandibus oleosis paucis vel moderate dispersis, irregularibus in ambito. Inflorescentiae axillares vel apparenter terminales, saepe in ramulis non foliosis, non ramosae, 7-floribus. Flores rutili. Filamenta staminum inflexa, exteriora sine antheris (staminodiis), antherae adnatae, basifixae, dehiscentes per poros laterales. Alabastra pedicellata, clavata, 1 ad 3 costatis longitudinalibus vel angulis, operculum conicum, operculo externo persistenti vel cadens in anthesin. Ovarium 4 vel 5-loculare. Ovula verticaliter 4-seriata. Fructus pedicellati, doliiformes vel suburceolati, 1 ad 3 costatis longitudinalibus vel angulis, valvis inclusis, discus decedens. Semina compresso-ovoidea, atrocinereo-brunnea vel nigra

Typus: Eucalyptus lansdowneana F. Muell. & J. Brown.

Mallees, branches flexuous and pendulous. *Bark* sometimes rough at base, usually completely smooth, decorticating in strips. Forming lignotubers. *Cotyledons* reniform. Pith glands absent. *Juvenile leaves* petiolate, remaining opposite for 2–4 pairs then alternating, ovate to broad-lanceolate, discoloured, dull, green. *Adult leaves* petiolate, alternating, lanceolate or falcate, concolorous, very glossy, yellow-green to green, oil glands sparse to scattered, irregular in shape. *Inflorescences* axillary or appearing apparently terminal through abortion of terminal leaf shoot, often on leafless section of branchlets, non-branched, 7-flowered. *Flowers* red. *Staminal filaments* inflexed, outer ones without anthers (staminodes), anthers adnate, basifixed, opening by lateral pores. *Buds* pedicellate, clavate, with 1–3 longitudinal ribs or angles, operculum conical, outer operculum persistent or outer shed just before anthesis. *Ovary* 4 or 5-locular. *Ovules* in 4 vertical rows. *Fruits* pedicellate, barrel-shaped to slightly urceolate, with 1–3 longitudinal ribs or angles, valves included, disc descending. *Seeds* compressed-ovoid, dark grey-brown to black with a fine to moderately pitted reticulum.

Etymology

From the Latin *vagitus* (to weep, squall) referring to the straggly, pendulous habit of the only species in the series.

Notes

E. ser. Vagitae is a monotypic series distinguished within *E. sect. Adnataria* by its combination of mallee habit, pendulous branches, very glossy, yellow-green to green leaves, red staminal filaments, outer stamens lacking anthers (staminodes) and large ribbed buds and fruits. The pendulous habit and red flowers are unique within *E. sect. Adnataria*.

E. ser. Vagitae is probably most closely related to *E. ser. Lucasianae* Chippendale, which shares with *E. ser. Vagitae* the mallee habit and staminodes but can be easily distinguished by the non pendulous habit, white staminal filaments and the much smaller, smooth buds and fruits. *E. sect. Adnataria* is predominantly eastern in distribution and diversity with only two series endemic outside the eastern states, viz. *E. ser. Lucasianae* containing *E. petraea*, *E. lucasii*, *E. cuprea* and *E. absita* (all Western Australian endemics) and the monotypic *E. ser. Vagitae* (*E. lansdowneana*).

4. *Eucalyptus lansdowneana* F. Muell. & J. Brown, *Forest Fl. S. Aust.* 9: t. 44 (1890).

Type citation: Pandura Run, SA., 1889, *T.L. Browne s.n.* (holo: AD; iso: AD, NSW).

Mallee, 2 to 5 m tall, of straggly habit, branches flexuous and pendulous. *Bark* rough for up to 1 metre on larger mallees, loose, grey-brown, then smooth, often smooth throughout, grey to tan over cream, decorticating in strips. Forming lignotubers. *Branchlets* with pith glands absent. *Cotyledons* reniform. *Seedling leaves* opposite for 2–4 pairs then alternating, petiolate, ovate to broad-lanceolate, 35–60 mm long × 22–35 mm wide, discoloured, dull, green. *Adult leaves* alternating, petiolate, lanceolate or falcate, 90–180 mm long × 14–30 mm wide, concolorous, very glossy, yellow-green to green; reticulation moderate, oil glands sparse to scattered, island and intersectional, irregular in shape, lateral veins at 30° to 45° from midrib. *Inflorescences* appearing terminal through abortion of terminal leaf

shoots, often on leafless sections of branchlets, unbranched, 7-flowered; peduncles slightly flattened to angular, 5–16 mm long; pedicels 2–5 mm long. *Buds* clavate, 10–14 mm long × 5–7 mm diam., hypanthium with a few longitudinal ribs or angles, operculum equal in width to hypanthium, smooth, or sometimes with ribs or angles extending from hypanthium, conical; both opercula held until flowering or outer operculum shed just before anthesis. *Stamens* inflexed, outer stamens without anthers (staminodes); anthers adnate, basifixed, globoid, opening by lateral pores. *Flowers* crimson-red fading to pink. *Ovules* in 4 vertical rows. *Fruits* pedicellate, cylindrical to slightly urceolate, with 1–3 longitudinal ribs or angles, 8–12 mm long × 7–12 mm diam.; operculum scar to 0.1 cm wide, ± level; disc descending, valves 4 or 5, enclosed. *Seeds* compressed-ovoid, 1.3–1.7 mm long, dark grey-brown to black with a fine to moderately pitted reticulum.

Distinguished from *E. albopurpurea* by the open, more straggly habit; pendulous branches; longer, lanceolate to falcate, very glossy, yellow-green to green adult leaves; larger buds and fruits; red staminal filaments with outer filaments lacking anthers; and the inland, rocky hillslope habitat.

Other specimens examined

SOUTH AUSTRALIA: Eyre Peninsula Region: Yandinga Gorge, ca 35 km N of Minnipa, 26.iv.1969, *A.E. Orchard* 2227 (AD); 5 km SE of Kododo Hill, -ix.1972, *D.N. Kraehenbuhl* 2620 (AD); Gawler Ranges, 16 km S of Yardea HS on road to Minnipa & ± opposite Conical Hill, 4.x.1972, *D.E. Symon* 8158 (AD); 30.4 km from Chilpuddic Tank towards Yardea Station, 30.iii.1977, *M.I.H. Brooker* 5591 (AD, CANB, MEL, NSW); Vicinity of Kododo Hill (17.6 km SW from junction of Yardea - Hiltaba road on Yardea - Minnipa road. Hill slopes W of road), 13.x.1977, *P.J. Lang* 973 (AD, CANB, NSW); Gawler Ranges - on hill SW of Scrubby Peak, 16.vi.1983, *D.F. Blaxell* 2052 & *L. Johnson* (AD, CANB, PERTH); 18.6 km SW of Yardea Homestead along road to Minnipa, 3.ix.1983, *J.D. Briggs* 1116 (AD, CANB, MEL, NSW); Gawler Range, Valley S of Scrubby Peak, SW slope of hill, 7.vi.1985, *D.R. Greenwood* 59 (AD, CANB); Scrubby Peak, Gawler Ranges, -ix.1991, *D. Nicolle* 57 (AD); 32°28'18"S, 135°23'24"E, (South-west of Yardea on W side of road, Gawler Ranges), 15.ii.1996, *D. Nicolle* 1678 (AD).

Distribution

E. lansdowneana is restricted to the higher, south-western part of the Gawler Ranges on upper Eyre Peninsula and is endemic to South Australia. It grows on the slopes and tops of various hills bounded by Kododo Hill, Conical Hill, Paney Bluff and the hills south-west of Scrubby Peak. It is usually found occurring in somewhat pure stands with various shrubs although occasionally it is seen growing with one or more of the following eucalypts: *E. porosa*, *E. phenax* subsp. *phenax*, *E. gracilis* and *E. socialis*.

Flowering period: Sporadic and recorded for all months of the year, most commonly June to October.

Notes

E. lansdowneana is isolated in *E. sect. Adnataria*, with no known close relatives. It is distinctive within the section because of its very open, pendulous crown and crimson flowers. The only other box species known to grow within the range of *E. lansdowneana* is *E. porosa*, which generally grows on the footslopes below *E. lansdowneana*. It is easily distinguished from *E. lansdowneana* among other characters by its larger, more robust stature and white flowers.

Conservation status

Of very restricted occurrence and not known to occur in a conservation reserve. The conservation code 2R, as given by Briggs & Leigh (1996) is appropriate.

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