FOUR NEW SPECIES OF EUCALYPTUS L'HERIT.
FROM SOUTH AUSTRALIA

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Abstract

Three new species of Eucalyptus are described from South Australia: E. calcarana from between the southern boundary of the Nullarbor Plateau and the Great Australian Bight, E. sparsa from the ranges in the north-west of South Australia and their vicinity, and adjacent ranges in Western Australia, and Northern Territory; and E. yumbarrana scattered in the arid west of South Australia. Data are presented for raising E. oleosa F. Muell. ex Miq. var. peeneri Blakely to specific status. All taxa are illustrated, specimens examined are listed, and the species relationships and ecology discussed.

1. Eucalyptus calcarana C.D. Boomsma, sp. nov.

Arbor, vel robusta multicaulis lignotubiferque vel parva unicaulis, plerumque usque 10 m alta, interdum altior; cortice veteri pulide griseo in laciniis longis decorticantibus et corticem laeves, primum subroseum, exponenti; medulla guttas olei continenti. Plantula dierum ducentorum cotyledonibus reniformis, plerumque ad apicem parum incisuris, foliis petiolatis, primis 3-4 paribus decussatis, pare primo elliptico, paribus distalibus ovatis usque ovato-lanceolatis. Folia adulta alterna, petiolata, 9-12 x 1.4-2.0 cm petiolo usque 2 cm longo excluso, lamina lanceolata, falcata apice uncinato, ravid-virida, vix nitida; costa in pagina inferiore sulcata; nervatura secundaria reticulata, indistincta; guttis olei copiosis, Inflorescentiae umbellae axillares 7-11 florum pedicellarium; pedunculo robusto, angulato, sursum dilatato, 7-10 mm longo; pedicellis manifestis, 2-3 mm longis. A labastra 6-8 x 4-5 mm; operculo hemispherico, obtuse conico, striato-costato, costis nonnullis in torum obconico-pyriformem decurrentibus. Antherae plus minusve basifixae, versatiles, obovoideae, loculis distinctis, loculicidus. Fructus in pediculo 1-2 mm longo portatus; toro obconico-pyriformi, 5-7 x 5-8 mm, ad basim attenuato, vix costato-striato; disco angusto, introrsum depresso, vix elevato planato; valvis 4 (5), rimamae aequatis vel vix excedentibus, triangularibus, ab obturamento sub dehiscentiam liberato obtectis; seminibus depressis, convexis, in ambitu lateovato-acutis, rufis, politis, in ca. 20 series areolarum polygonalium sculptis.

Holotypus: South Australia, 43 km along Eyre Highway W. of Nundroo, 31° 29'S, 131° 53'E, 11.3.77, G.C. Cornwall (AD).

As flowers were present on some individuals in April it is likely to be an autumn flowering species.

Distribution (See Fig. 2)
**Fig. 1 Eucalyptus calcareana** C.D. Boomsma. a. anther, X 25; b. large fruit from Nundroo; c. seeds, X 7; d. enlarged segment of dorsal seed surface; e. plug from apex of capsule; f. seedling 100 days old. (Illustration from holotype except b. which is from Nundroo, F. Mason, 1974.)
Current records indicate that this species flourishes as a tree on the lower slopes of sheltered, linear depressions or narrow valleys westwards from near Penong spaced at irregular intervals along the fringe of the Nullarbor Plain in its south-eastern sector. On the comparatively drier more exposed mid to upper slopes, and occasionally the crests, it is reduced to a mallee and is associated there with one or more of E. yalatensis C.D. Boom, E. oleosa F. Muell. ex Miq. and E. gracilis F. Muell.

Selection of Specimens examined

SOUTH AUSTRALIA: 5 km W. of Penong, 31° 56' S., 132° 50' E, 10.3.77, G.C. Cornwall (AD); 90 km along Eyre Highway W. of Nundroo, 31° 15' S., 132° 15' E, 10.3.77, G.C. Cornwall (AD); 68 km along Eyre Highway W. of Nundroo, 31° 18' S., 132° 21' E, 10.3.77, G.C. Cornwall (AD); 22 km along Eyre Highway W. of Nundroo, 31° 37' S., 132° 03' E, 11.3.77, G.C. Cornwall (AD); Nundroo, 31° 46' S, 132° 21' E, September 1974, F. Mason (Woods and Forests Department, Adelaide); near head of Gt Aust. Bight, 31° 25' S, 131° 18' E, 16.6.76, G.C. Cornwall (Woods and Forests Department, Adelaide); 5 km W. of Yalata, 31° 27' S, 131° 38' E, May 1973, B. Lay (AD, Department of Agriculture and Fisheries); 130 km W. of Cook Road X Eyre Highway, 31° 28' S, 129° 34' E, 2.4.77, M.I.H. Brooker (AD).

WESTERN AUSTRALIA: Eucla Pass, 31° 41' S, 128° 53' E, 2.4.77 M.I.H. Brooker (AD).

Discussion

Westwards from the recorded distribution in South Australia, it appears to be replaced in sub-coastal areas of Western Australia by Eucalyptus conglobata (R.Br. ex Benth.) Maid. and E. fraseri (Brooker) Brooker on uplands, viz. Fraser Range.

Gardner (1960) regarded E. pileata as having a constant mallee form, a costate operculum which is wider than the smooth torus, lustrous leaves, and a fruit which “is never deeply ribbed or corrugated”. However, tree forms to 15 m high have been observed in woodland with Eucalyptus dundasii Maid. by P. Lang (pers. comm.).

In contrast, E. calcarea usually has a tree form (to 10 m high), often being the tallest and most shapely tree in the region, although mallee forms occur on shallow rocky and exposed sites. The adult leaves are coarser, sage-green, scarcely shining or glossy when fresh, and with a length-breadth ratio of (6-) 7(9) compared with (5-) 6(-9) for the more variable leaves of E. pileata. As shown in Fig. 1(b), the torus of the fruit is markedly costate and the operculum may not be regularly wider than the torus.

The lustrous red-brown seeds place E. calcarea in the series Dumosae of Pryor and Johnson (1971), with an affinity to E. pileata and E. fraseri. Both E. fraseri and E. conglobata have adult leaves which are coarse, often wider to 3 cm, a length-breadth ratio of 5(-6), and consistently larger buds and fruits.

Because of the close relationship of E. calcarea to some forms of E. pileata, subspecific status might be thought more appropriate, but its distinctions are sufficiently clear for it to be recognised as a separate species.

The specific name alludes to its presence on soils associated with limestone.

2. Eucalyptus sparsa C.D. Boom, sp.nov.

Arbor, interdum unicaulis, parva, plerumque multicaulis lignotubiferque, robusta, usque ad 6m alta; cortice in 2/3 partibus infernis trunci persistenti, cinereus usque cinereo-brunneo, aspero, ex laciniis brevibus latisque amplitudine variabili, 5-10 x 2-5 cm constante; medulla guttas olei interdum continent; Plantula dierum ducentorum cotyledonibus parvis, ad apicem vix lobatis incisuris, foliis decussatis, petiolo manifesto, cortice in vivo nitida viridi, vix flexibili, in sicco plerumque flavo-viridi rigidissima; costis in paginis ambabus prominentibus; nervaturae manifestae, grosse reticulatae, vena intramarginalis 1.5-3.5 mm a margine remota; guttis olei paucis obscuris. Inflorescentiae paniculatae, terminales axillares; pedicellis brevibus. Alabastra operculo latere conico-hemisferico, plerumque toro cupulato-hemispherico multo breviori. Fructus in pedicello 1.5-2.5 mm longo, robusto tereti, in sicco compressus vel + angulato portatus, cupulato-hemisphericus, longitudine latitudineaequanti, 4.5-6 x 4.5-6 mm, pariete lati, saepe orificio parum constricto; valvis parvis, (3)4(5), rimam aequatis vel infra seminibus depressis, convexis, in ambia latere ovato-acutis, 1.3-1.7 x 0.9-1.2 mm, ravid-brunneis, in ca. 15 series areolarum 4-6 latibus non profunde sculpitis.
Sometimes a small tree, but usually a robust mallee to 6 m high; bark persistent, grey to greyish-brown, rough on lower two thirds of trunk, composed of short broad flakes of variable size, 5-10 x 2-5 cm; pith occasionally containing oil glands. Seedling (at 200 days old): cotyledons small, weakly lobed or notched at apex; leaves decussate, petiolate, thick, first pair narrow oblong-lanceolate, flat, subsequent pairs wider to ovate, concave from above, with venation distinct, scarcely reticulate, with oil glands few and obscure, at least the first seven pairs greyish-green, subsequent pairs shining green. Adult leaves alternate, with distinct petiole 1.5-2.5 cm long, lamina 5-12 x 1.5-3.5 cm, length: breadth ratio usually less than 4:1, lanceolate to ovate-lanceolate or ovate, apex acute, base rounded, glossy mid-green and scarcely flexible when fresh, usually yellow-green and strongly rigid when dried; midrib prominent and raised on both surfaces; venation distinct, coarsely reticulate, with intra-marginal vein distant from margin by 1.5-3.5 mm; oil glands few and obscure. Inflorescences paniculate, both terminal and axillary; pedicels short. Buds with operculum broadly conical-hemispherical, generally much shorter than the cupular-hemispherical torus. Fruit borne on stout pedicel 1.5-2.5 mm long, terete, compressed or angular when dried; torus cupular-hemispherical, as long as broad, 4.5-5 x 4.5-6 mm, thick-walled, often with slightly constricted orifice; valves small, (3)4(5), lower than or level with rim; seeds flattened-convex, broadly ovate-acute in outline, 1.3-1.7 x 0.9-1.2 mm, greyish-brown, shallowly sculptured into about 15 rows of 4-6-sided areolae. (Fig. 3.)
Fig. 3. *Eucalyptus sparsa* C.D. Boomsma. a. inflorescences; b. seedling 150 days old; c. branchlet; d. anther. X 25 e. seed. X 15. (Illustration from holotype except a, d and e, which are from Lameroo, *ex cult.*
**Distribution (See Fig. 2)**

The distribution of this species ranges from the summit of Mt Woodroffe and other rocky mountains and hills to favoured 'run-on' plains at the base of ranges in the Desert Province as follows: Western Australia Rawlinson and Blackstone Ranges; Northern Territory Mulga Park Pastoral Station; South Australia Everard, Tompkinson, Mann, Musgrave, Birksgate Ranges, Patricia Hills, and Cheeseman Peak.

**Specimens examined**

**SOUTH AUSTRALIA:** Summit of Mt Woodroffe, 26° 15' S, 131° 51' E, 18.9.55, J.L. Johnson (Woods and Forests Department, Adelaide); Patricia Hills, 27° 22' S, 129° 10' E, April 1966, R.B. Major, (Woods and Forests Department, Adelaide); Victory Bore, Everard Range, 27° 04' S, 132° 30' E, 24.9.55, J.L. Johnson (Woods and Forests Department); Bull's Hill, Currie Creek Basin, 26° 40' S, 131° 25' E, 1.10.55, J.L. Johnson (Woods and Forests Department, Adelaide); Everard Range, 27° 02' S, 132° 45' E, January 1973, D.E. Symon (ADW).

**NORTHERN TERRITORY:** Mulga Park Station, 24° 50' S, 132° 45' E, 1960, J.B. Cleland (AD), 5.8.1957, N. Forde, (NT); 32 km SSW. Docker R. settlement, Petermann Range, 25° 09' S, 129° 06' E, 4.11.1970, C.R. Dunlop (NT).

**WESTERN AUSTRALIA:** Blackstone Range, 26° 02' S, 128° 23' E, 8.1.73, D.E. Symon (ADW, Woods and Forests Department, Adelaide), 47 km NNW. Wingelinna, 25° 42' S, 128° 45' E, 30.10.1970. C.R. Dunlop (NT).

**Discussion**

The brief description in Black (1952) of *E. largiflorens* F. Muell. var. *xanthophylla* Blakely (1934) agrees quite well with that of *E. sparsa* but is misapplied. *E. largiflorens* var. *xanthophylla* has been listed as synonymous with *E. normantonensis* Maiden and Cambage by Pryor and Johnson (1971).

As the broad leaves of *E. sparsa* are lustrous green when fresh and lustrous yellowish and rigid when dried, these leaf characters are generally sufficient to separate *E. sparsa* from the other two northern boxes in South Australia, *E. microtheca* F. Muell. and *E. intertexta* R.T. Baker, which have narrower, dull and flexible leaves. This coarse-leaved box is referable to the series *Largiflorentes* of Pryor and Johnson (1971) or subseries *Subplatyphyllae* of Blakely (1934). Its robust mallee habit and wide, persistent, intermediate, broad-lanceolate leaves suggest that it could be placed near *E. behriana* F. Muell.

It most frequently grows on coarse-textured well-drained soils, on hill slopes or on plains receiving 'run-on' drainage from rocky slopes in contrast with *E. intertexta* and *E. microtheca*, which are closely associated with drainage channels, creeks and waterways.

The specific name refers to its sparse occurrence in South Australia.

3. **Eucalyptus yumbarrana** C.D. Boomsma, sp. nov.

**Arboar, vel multicaulis lignotubiferque effusa usque robusta, vel unicaulis parva umbrosa, interdum ramis cernuis; medulla guttas olei carenti. Plantula dierum ducentorum cotylenibis in duos lobos lineares incisis, foliis decussatis, paribus saltem 12 primis sessilibus vel fere ita, pare primo lineari, paribus ca. 8 distalibus latioribus usque ellipticis, ultimis ovato-lanceolatis decurrentibusque, Folia adula saepe foliis praematuris latissimis; alterna, petiolo angulato-compresso, 2.0-3.5 cm longo, lamina crassa, lanceolata, 10-12 x 2.0-2.4 cm, falcata, base plerumque rotundata, interdum attenuata, apice longo, acuminate, in unco manifesto terminanti, hebeti pallido-viridi sed saepe in sicco pallido-flavovirenti. Inflorescentiae umbellae axillares 7(9) floribus; pedunculo 6-11 mm longo, robusto. angulato-compresso, apice dilatata; pedicellis 3-5 mm longis, angulatis, ad basem per longitudinem totam attenuatis. Alibastra operculo rostrato, toro longiore et ad juncturam commissuralem latiore; styllo in operculum extensissimo. Stamina manifeste flava, antheris versatilibus, parvis, bilobatis, ellipsoido-globosis, a poris orbicularibus dehiscentibus. Fructus in pedicello interdum subangulato, ad basem per longitudinem totam attenuato portatus; toro hemispherico-suburceolato, plerumque paulo longiori quam latitudinem, 0.9-1.1 x 0.8-0.9 cm, orificio parum constricto; pariete lato, robusto; valvis subulatis, fragilibus, exsertis sed saepe non nisi basibus remanentibus; seminibus depressis, convexis, in ambitu late ovato-acuminatis usque oblongo-obtusis. ravido-brunneis, splendidis, in ca. 20 series aerolarum polygonium non profunde sculptis.

**Holotypus:** South Australia, Yumbarra Conservation Park, 31° 45' S, 133° 35'E, 17.6.77, T. Dennis (AD 97726343). **Isotypus** (AD 97726344).
Fig. 4. *Eucalyptus vumbarrana* C.D. Boomsma. a. branchlet; b. fruit; c. seedling 200 days old; d. bud at anthesis; e. anther, X 30; f. seed, X 15. (Illustration from holotype.)
A straggly to robust mallee or small umbrageous tree, sometimes with drooping branches; pith lacking oil glands. Seedling (at 200 days old): cotyledons bisected into two linear lobes; leaves decussate, at least first 12 pairs sessile or nearly so, first pair linear, subsequent pairs wider to elliptic for about 8 pairs, finally ovate-lanceolate and decurrent. Adult leaves often outnumbered by broad pre-adult leaves, alternate, with petiole angular-flattened, 2.0-3.5 cm long; lamina thick, lanceolate, 10-12 x 2.0-2.4 cm, falcate, base usually rounded, sometimes attenuate, apex long and tapered, ending in a distinct hook, dull light green but often drying light yellowish-green. Inflorescences axillary umbels of 7(9) flowers; peduncle 6-11 mm long, robust, angularly-compressed and flattened, with expanded apex; pedicels 3-5 mm long, angular, narrowed towards base over whole length. Buds with operculum beaked, longer than the torus and wider than it at the commissural junction; style extended well into operculum. Stamens distinctly yellow, anthers versatile, small, bilobed, ellipsoid-globose, opening by large orbicular pores. Fruit borne on sometimes + angular pedicel tapering towards base over whole length; torus hemispherical-suburceolate, usually just longer than wide, 0.9-1.1 x 0.8-0.9 cm, slightly constricted at orifice; wall thick, robust; valves subulate, fragile, exserted, but often with only the bases remaining; seeds flattened-convex, broadly ovate-acuminate to oblong-obtuse in outline, greyish-brown, lustrous, shallowly sculptured into about 20 rows of polygonal areolae. (Fig. 4.)

Distribution (See Fig. 2)

This species is prominent in mallee patches in arid lands in and about Yumbarra Conservation Park. Its recorded distribution extends from near the western end of the Gawler Ranges (Hiltaba) to near the Western Australian border north of Lake Wyola, a distance exceeding 400 km.

Specimens examined

SOUTH AUSTRALIA: Yumbarra Conservation Park, 31° 45' S, 133° 35' E, 10.9.74, F. Mason (Woods and Forests Department); James, 30° 45' S, 133° 10' E, 8.6.70, J.L. Johnson and S. Reid (AD, Woods and Forests Department); Lake Wyola North, 28° 51' S, 130° 20' E, 27.5.70, J.L. Johnson and S. Reid (Woods and Forests Department); Yaranna Hills, 32° 40' S, 135° 35' E, 10.10.72, D.E. Symon (ADW); Yumbarra C.P., 31° 45' S, 133° 35' E, 26.8.76, G.W. Anderson (AD); Eldede H.R., Yumbarra, 31° 45' S, 133° 35' E, 24.10.70, B. Lay (AD, Agriculture and Fisheries Department); 35 km N of Hiltaba, 31° 10' S, 135° 05' E, 9.9.72, A.G. Spooner (AD); Vokes-Cook, 29° 25' S, 130° 30' E, 2.6.70, J.L. Johnson and S. Reid (AD); Barton, 30° 30' S, 132° 40' E, 17.9.26, E.H. Ising (AD).

Discussion

This species has obvious affinities with both E. socialis F. Muell and E. flocktoniae Maiden. From the former it differs in having broader, thicker, often larger adult leaves, longer petioles to 3.5 cm and larger, thick-walled, truncate fruit, which can have a rugose surface. From E. flocktoniae it differs in having broad dull leaves, and large thick-walled fruit which can have a rugose surface. There is little doubt that it belongs to the series Oleosae near E. socialis in the classification of Pryor and Johnson (1971).

Associated mallees in open scrub patches include E. incrassata Labill. and E. foecunda Schau.

The specific name refers to the locality of collection of the holotype.


This elusive, poorly collected mallee was briefly described by Blakely (1934) as "spreading, 1.3 m high, with prostrate or erect stems", and "dark light grey and rough to the small branches". In the absence of a holotype, a lectotype is chosen from the syntype.
Fig. 5. *Eucalyptus peeneri* (Blakely), Pryor et Johnson ex C.D. Boomsma a, branchlet b, buds; c, intermediate leaf; d, seedling 100 days old; e, seed, X 15; f, branchlet; g, anther, X 25. (Illustrations a and b from syntypes: of c, d, e, f, and g from Eldodeh Rockhole, *B. Lay 490.*)
specimens, NSW 133736-7, which were collected from east of Ooldea and eastwards to Barton, by H. Deane, 1909, and E. Ising, 1920, respectively. Only a few collections, housed in AD, have been made in recent years from Western Australia, at Lorna Glen P.L., 26° 00' S 121° 31' E; Wiluna, 26° 35' S 120° 15' E; and N.W. of South Australia, at Serpentine Lake, 30° 20' S 133° 05' E; Maralinga, 28° 35' S, 132° 10' E; N.W. Eldodeh Rockhole, 30° 20' S 133° 05' E; and 103 km N of Hughes 29° 45' S 129° 35' E.

The seedlings which were grown from seed collected from Eldodeh Rockhole, South Australia, by B. Lay had bisected cotyledons, two pairs of linear leaves and at least eight to ten pairs of narrow-oblong leaves, variously arranged, alternate, opposite or adjacent as in *E. oleosa*. They merged into linear, intermediate leaves 6-7 cm long and were subsequently replaced by ashy-grey, oblong-lanceolate adult leaves. In the latter, oil glands are numerous and conspicuous, venation is obscure, and the size range is 5-7 x 0.8-1.0 cm. The fruit which is sub-globular, 0.7-0.8 cm, with a narrow rim and constricted orifice, has fragile, subulate, exserted valves and a terete pedicel 2-3 mm long, which agrees well with the syntypes. (Fig. 5.)

**Discussion**

There is an obvious similarity between seedlings of *E. oleosa* F. Muell. ex Miq. and those of its var. *peeneri* Blakely, but an equally obvious divergence is exhibited in the long, linear intermediate leaves of *E. oleosa* var. *peeneri* compared with the elliptical, narrow-lanceolate leaves of *E. oleosa* var. *oleosa*. The differences in the intermediate and adult leaves justify the elevation of var. *peeneri* to a species level as proposed by Pryor and Johnson (1971). If the few records of isolated occurrences of *E. peeneri* properly represent its distribution in southern Australia, then it can be concluded that it is a relict taxon barely surviving in a sufficiently large area to withstand further adverse environmental changes.

During four years in cultivation, it has developed a shrubby habit comprising some twenty stems which have reached 1.4 m high, and has also produced buds and fruits which are in reasonable agreement with those of the syntypes.

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**References**