

A new mallee species *Eucalyptus phoenix* (Myrtaceae) from Brumby Point, East Gippsland, Victoria

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Introduction

The authors first observed this new entity at Brumby Point on the Nunniong Plateau in May 2002, prior to the severe summer fires of early 2003. One small stand of c. 30 dwarf mallees was noted at the eastern end of the Brumby Point Track. Two additional stands were noted on rocky outcrops north of the track: c. 20 dwarf mallees c. 100 m west of the first stand and c. 40 dwarf mallees c. 250 m west of the first stand. The only collection taken at this time was a small amount of vegetative material. While fruiting material was noted, none was collected at the time. It was not until late spring of 2003 that we returned to the fire-devastated landscape of Brumby Point where, to our amazement, we recovered a small number of unopened seed capsules from one of the severely burnt mallees at the eastern end of Brumby Point Track. It was from these that seedlings were grown at Facey's Nursery, Cranbourne, Victoria in an attempt to clarify the identity of this enigmatic dwarf mallee. The degree of uniformity in seedling characters proved to be consistent with a stable entity rather than a hybrid taxon. Furthermore, the hispid seedling leaves and stems, and the occasional slightly oblique leaf bases, tentatively locate the new taxon in the stringybark series *Pachyphloiae* Blakely of *Eucalyptus* L'Her. Growth trials bringing these seedlings to flowering and fruiting furnished further evidence of the stability of the new taxon throughout all life stages. Subsequent collection of flowering type material was taken from the field in November 2010, by which time post-fire regeneration had advanced sufficiently to confirm the distinctive characters demonstrated by seedling and growth trials at a field population level.

Taking into consideration the suite of characters that separate this entity from other stringybarks we consider it worthy of recognition at species rank.

Abstract

A new species of *Eucalyptus* L'Her. with remote affinities to *Eucalyptus mackintii* Kottke is described. *Eucalyptus phoenix* Molyneux & Forrester *sp. nov.* is a rare dwarf mallee currently known from three small stands at Brumby Point on the Nunniong Plateau in the Alpine National Park, East Gippsland, Victoria. Its distribution, ecology, affinities and conservation status are discussed.

Key words: mallee, stringybark, series *Pachyphloiae*, morphology, taxonomy

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Taxonomy

Eucalyptus phoenix Molyneux & Forrester, *sp. nov.*

A new species with affinities to *Eucalyptus mackintii* as suggested by hispid seedling leaves and stems, conical bud operculae and hemispherical fruit but differing by its mallee habit, bark smooth except at base and peduncles occasionally paired.

Type: VICTORIA. Eastern end of the Brumby Point Track, 37°03'12" S, 148°04'42" E, 15.xi.2010, *W. Molyneux & S. Forrester s.n.* (Holotype MEL 2360702; Isotypes: AD, CANB, K, NSW, NY, S).

Dwarf mallees, 2–5 m tall. *Lignotuber* present. Bark smooth almost to the ground, white to light grey; old bark at base sometimes forming a short stocking of flaky bark decorticating as thin strips and plates. *Seedling leaves*, ovate, cordate, opposite for 3 or 4 pairs, petiolate, discolorous, dark green above, pale green below, hispid for 5 or 6 pairs; margins hispid. *Seedling stems* round in cross section, hispid. *Juvenile leaves* ovate, rarely basally oblique, acuminate or apiculate, alternate, petiolate, non-hispid, slightly discolorous, dull, light green or blue green, 5–8 cm long, 1.5–4 cm wide; *petioles* 4–11 mm long. *Intermediate leaves* ovate or sub-orbicular, petiolate, slightly discolorous, dull blue-green, broader than juvenile leaves; lateral and intramarginal veins prominent on both surfaces. *Adult leaves*, lanceolate to broadly lanceolate or ovate lanceolate, symmetric or sometimes slightly basally oblique, apex apiculate or acuminate, uncinata, sparsely reticulate, concolorous, lustrous, green, (4–)8–10(–13) cm long, (1.8–)2–3(–3.8) cm wide; lateral veins prominent, inclined at 30–40 degrees from the mid-vein, intramarginal vein prominent, remote, 3–5 mm from the margin, oil glands abundant, regular, island; *petioles* 1–1.7 cm long. *Inflorescences* axillary, solitary or sometimes twinned, 5–11-flowered; peduncles slender, terete or slightly angular, (2–)8–14 mm long. *Floral buds* clavate, pedicellate, unscarred, 3–4-locular, 6–8 mm long, 3–4 mm wide; pedicels 3–4 mm long; operculum conical, flush with the hypanthium at the abscission zone, tinged red prior to anthesis, 3–5 mm long, 3–4 mm wide; stamens irregularly flexed, all fertile; filaments white; anthers sub-basifixed, versatile, reniform,

dehiscing through oblique confluent slits. *Ovules* in two longitudinal rows. *Fruits* often clustered on leafless branches, hemispherical, thick-walled, subsessile or shortly pedicellate, 7–8 mm long, 6–8 mm wide; pedicels 1–2 mm long; disc narrow and slightly folded, level with rim or occasionally shallowly ascending in old fruit; valves 3 or 4, triangular, level with disc. *Fertile seeds* dark brown, irregularly sub-pyramidal, dorsal surface shiny, minutely and unevenly verruculose; hilum ventral. (Fig. 1A–F)

Flowering period: Late spring to early summer.

Additional specimens examined: VICTORIA. Cultivated at Dixons Ck (from seed collected late spring 2003 from upper northerly slopes north of Brumby Point Track, c. 100 m west of Brumby Point, 37°03'12" S, 148°04'37" E), 24.xii.2006, *W. Molyneux & S. Forrester s.n.* (MEL 2331166, 2331167); Cultivated at Dixons Ck (from seed collected late spring 2003 from upper northerly slopes north of Brumby Point Track, c. 250 m west of Brumby Point, c. 6.8 km. from Diggers Hole Spur Track, 37°03'12" S, 148°04'32" E), 20.vi.2008, *W. Molyneux & S. Forrester s.n.* (MEL 2331168, 2331169).

Distribution and habitat: *Eucalyptus phoenix* is currently known only from a single small population at Brumby Point on the Nunniong Plateau in the Alpine National Park in East Gippsland, Victoria. The population comprises three small stands near the eastern end of Brumby Point Track and upper northerly slopes immediately to the west. The habitat is a spur at an elevation of c. 1360 m asl supporting sub-alpine woodland dominated by a unique suite of mallee and dwarf eucalypts. Geology is strongly tilted and banded metamorphosed siltstone of Palaeozoic age.

Associated species: *Eucalyptus* aff. *dives* Schauer, *E. elaeophloia* Chappill, Crisp & Prober, *E. forresterae* Molyneux & Rule, *E. kybeanensis* Maiden & Cabbage, *E. aff. kybeanensis*, *E. mannifera* Mudie subsp. *mannifera* and *E. pauciflora* Sieber ex Spreng. subsp. *pauciflora* have been observed growing near or adjacent to *Eucalyptus phoenix*. *Eucalyptus dalrympleana* Maiden subsp. *dalrympleana*, *E. glaucescens* Maiden & Blakely and *E. perriniana* F.Muell. ex Rodway also occur in the vicinity of Brumby Point. The site has outstanding biogeographic significance as a 'hot spot' for a suite of endemic and rare species and disjunct plant populations (Chappill *et al.* 1990) including a population of *Acacia lucasii* Blakely (known in Victoria only from here and a site shortly to the east), *Actinotus forsythii* Maiden & Betche and



Figure 1. **A.** Seedlings, illustrating uniformity and hispid juvenile growth; **B.** young plant illustrating hispid growth; **C.** smooth-barked stem of an 8-year-old *Eucalyptus phoenix* cultivated at the authors' property; **D.** buds and flowers; **E.** mature fruit; **F.** adult leaf venation pattern and uncinately leaf tip

Monotoca rotundifolia J.H. Willis, all of which are disjunct outliers from southern New South Wales. The site also supports the type populations of three other highly restricted Victorian endemics: *Eucalyptus forresterae* (Rule & Molyneux 2011), *E. elaeophloia* (Chappill *et al.* 1990) and *Leptospermum jingera* Lyne & Crisp (Lyne & Crisp 1996). Other rare species with populations at Brumby Point include *Grevillea pachylostyla* (McGill.) P.M.Olde & N.R.Marriott, *Monotoca oreophila* Albr. and *Viola improcera* L.G.Adams.

Conservation status: The new species is restricted to a single known population comprising fewer than 100 mature individuals in three small stands with an estimated extent of occurrence of 5000 m² based on a linear extent of 250 m and maximum average width of 20 m and an estimated area of occupancy less than 0.5 ha. The species is arguably subject to continuing decline in the quality of its habitat as a consequence of the inferred and projected impact of climatic drying and elevated temperature thresholds on the recruitment potential of almost all Victorian montane to subalpine eucalypts (Nitschke & Hickey 2007) and, by inference, *E. phoenix*. The species is therefore assessed as critically endangered under the IUCN Red List categories and criteria (IUCN 2001) with a threat code of CR B1ab(iii)+2ab(iii). The species also qualifies unambiguously as endangered under criterion D since the estimated population size is well below the threshold of 250 mature individuals (EN D).

Etymology: The epithet *phoenix* commemorates the serendipitous discovery of a small amount of seed of this rare new plant following the apparently all-consuming fire of 2003. Like the fabled bird of Greek mythology *Eucalyptus phoenix* arose from the flames of a fire.

Recommended English name: *Brumby Mallee-gum*.

Discussion

Eucalyptus phoenix appears to have its nearest (although still somewhat remote) affinity with *E. mackintii* (Kottek *et al.* 1990) through the shared hispid seedling leaves and stems, the buds with a conical operculum and similar fruit shape. The new species differs in its mallee habit, smooth bark, occasionally paired peduncles, pedicellate buds (sessile in *E. mackintii*) and fruit with a narrow, more or less level disc (broader, more or less ascending in *E. mackintii*).

Eucalyptus phoenix also demonstrates more distant affinity with *E. macrorhyncha* as illustrated by the shared hispid seedlings and oblique adult leaf bases but differs markedly by its smooth rather than fibrous bark and smaller fruits with a level or shallowly ascending disc (in contrast to the strongly ascending disc of *E. macrorhyncha*).

Eucalyptus phoenix is tentatively placed within *Eucalyptus* series *Pachyphloiae*, noting that *E. phoenix* is not unique amongst the stringybarks in having smooth or flaky bark and mallee habit. Other species of 'stringybark' sharing these traits include *E. olsenii* L.A.S.Johnson & Blaxell, *E. deuaensis* Boland & P.M.Gilmour, *E. serraensis* Ladiges & Whiffin and *E. verrucata* Ladiges & Whiffin.

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