

## A New Peppermint for Victoria

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### Abstract

*Eucalyptus molyneuxii* K. Rule, a rare peppermint occurring in Victoria's Little Desert, whose features include narrow-lanceolate, falcate, sub-lustrous, green juvenile leaves, and comparatively small, thick-walled fruits, is described. Its distribution, ecology, affinities and conservation status are discussed.

### Introduction

"Shining Peppermint" and "Shiny-leaved Peppermint" are names that have been loosely applied to a number of peppermint eucalypts with varying degrees of coriaceous, lustrous adult leaves. Tasmanian populations exhibiting these features were described firstly as *E. nitida* Hook. (1856) and then as *E. simmondsii* Maiden (1922). Later, Willis (1970) considered these as conspecific and Willis again (1973) regarded Victorian peppermints with similar features as a part of *E. nitida*. However, studies by Marginson & Ladiges (1982) and Marginson, Ladiges & Brooker (1983) justified the segregation of the mainland populations of Wilsons Promontory, the Gippsland Lakes region, south-western Victoria and adjacent areas of South Australia and the Grampians as *E. willisii*. In both studies fundamental differences in juvenile morphology were identified. Newnham, Ladiges & Whiffin (1986), in a follow-up study, described the Grampians populations as *E. willisii* subsp. *falciformis*. Their decision was supported by the new subspecies being separable in a wide range of characters, most notably by its distinctly falcate juvenile leaves. They also found that the form occurring in south-western Victoria and adjacent areas of South Australia exhibited adult features close to the new subspecies but retained it as a part of *E. willisii* subsp. *willisii* on the grounds of similarities in juvenile morphology.

More recently, however, Mr David Rankin of La Trobe University, in an as yet unpublished wider study of the peppermints, found marked regional differences within *E. willisii* to the extent that a further taxonomic revision is needed (pers. comm.). For example, the populations of the Gippsland Lakes region (here referred to as the "Gippsland Lakes Form") have been found to represent an undescribed taxon. As well, the populations occurring in subcoastal and coastal areas of south-western Victoria and adjacent areas of South Australia, together with *E. willisii* subsp. *falciformis*, have been found to constitute a western complex of variable shining peppermints.

Further, the discovery in 1966 of the species treated here in the most unlikely location of Victoria's Little Desert National Park has again increased the number of Victorian endemic shining peppermints. The features of this new species include narrow-lanceolate, falcate, sublustrous, green juvenile leaves and comparatively small, thick-walled fruits. Comparative seedling trials and field studies have demonstrated its morphology as markedly distinctive and it is thus described as a new species.

### Taxonomy

***Eucalyptus molyneuxii*** K. Rule *sp. nov.*

*E. willisii* Ladiges, Humphries & Brooker affinis; a subsp. *willisii* ramulis non-pendulis, foliis juvenalibus anguste lanceolatis falcatis nitentibus viridibus non-

amplexicaulibus, foliis adultis nitentibus viridibus differt; a subsp. *falciformi* Newnham, Ladiges & Whiffen ramulis non-pendulis, foliis juvenalibus et adultis minoribus angustioribus nitentibus viridibus, et alabastris et fructibus minoribus differt.

*Type:* Victoria, Wimmera, the 15 km post along the McDonald Highway, Little Desert N P, 36°35'S, 141°29'E, 15 vi 1997, K. Rule 9795 and P. Hawker (holotype MEL 2052701, isotypes AD, CANB).

*Mallees* or small *trees* to 5 m tall; branchlets semi-rigid. Bark peppermint-like, to various heights, often loosely attached, grey, thin; upper bark smooth, yellowish. *Seedling stems* verrucose. *Seedling leaves* decussate, narrow-elliptical, lustrous, dark green above, discolorous. *Juvenile leaves* decussate for a few pairs then irregularly arranged, opposite for at least 15 pairs, subsessile by 12 pairs, non-amplexicaul, linear-lanceolate or narrow-lanceolate, tapered to a fine point, falcate and vertically oriented by 10–15 pairs, sublustrous, green, slightly discolorous, 8–13 cm long, 0.8–1.5 cm wide. *Intermediate leaves* opposite, subopposite or alternate, lanceolate, falcate, broader than juvenile leaves, sub-lustrous, green or blue-green. *Adult leaves* alternate, petiolate, the blade lanceolate, 6–11 cm long, 1–1.6 cm wide, lustrous, green, concolorous, markedly coriaceous (0.38–0.51 mm thick), acuminate, uncinata, glandular; petioles thick, flattened, 0.5–1 cm long; venation acute (sub-parallel), visible but not conspicuous; lateral veins angled at 15–25 degrees to midvein; intramarginal 2–3 mm from margin with a faint secondary intramarginal vein approximately 1 mm from margin; areoles large, containing relatively large, scattered island glands. *Inflorescences* axillary, simple, 11–15-flowered, tightly clustered; peduncles thick, angled, 5–8 mm long. *Floral buds* ovoid-clavate, subsessile or shortly pedicellate, 5–7 mm long, unscarred, 3–4 mm wide; operculum obtuse-conical; locules 3 or 4; ovular rows 2; filaments white; stamens inflexed, all fertile; anthers versatile, reniform, opening by oblique, confluent slits. Flowering in Autumn. *Fruit* subsessile, less often sessile, cupular or obconical, 4–5 mm long, 5–6 mm wide; pedicels 0–2 mm long; disc at rim level, approx. 1.5 mm wide; orifice small, 2–3 mm wide; valves 3 or 4. Fertile seeds black-brown, pyramidal; dorsal surface rounded; hilum ventral (See Figure 1).

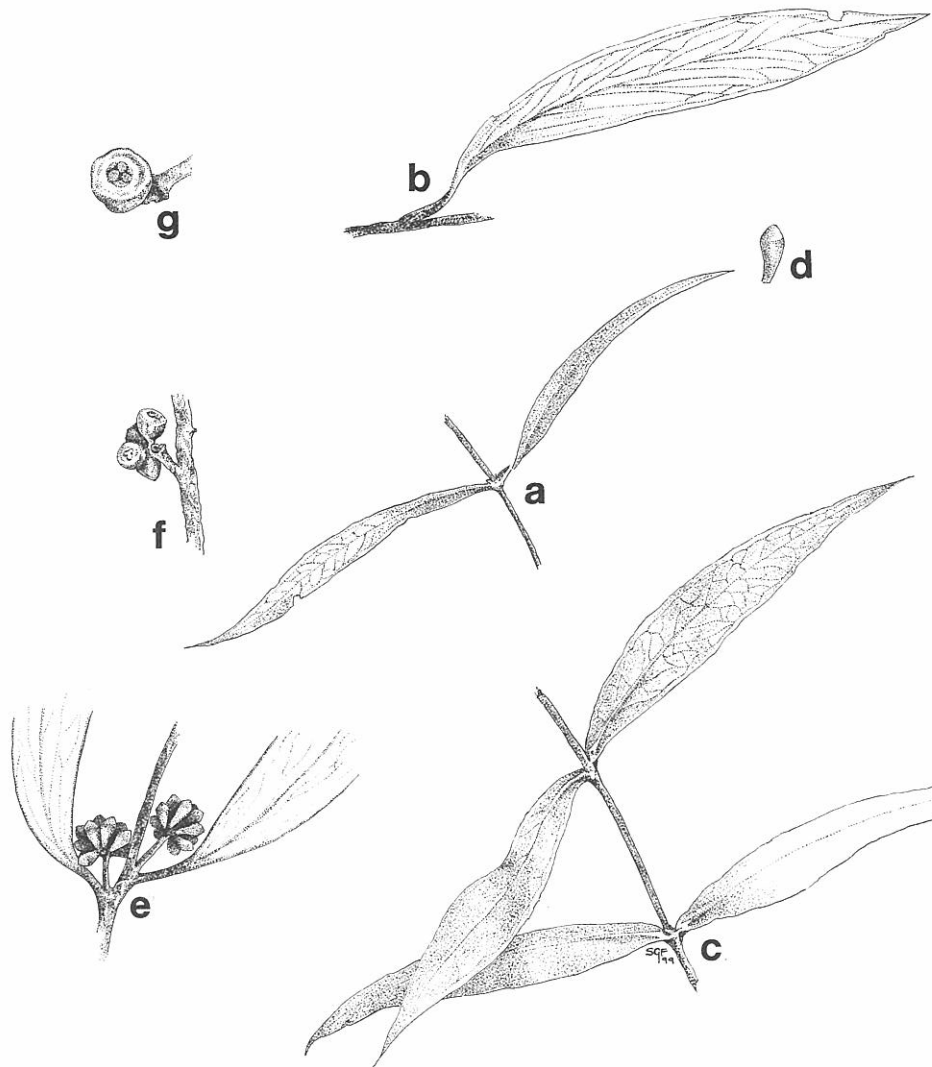
*Additional specimen examined:* VICTORIA: Little Desert, along the McDonald Hwy., approx. 12 km east of the Nhill-Harrow Road, 36°35'S., 141°29' E., 15 vi 1997, K. Rule 9796 and P. Hawker (MEL).

*Distribution and habitat:* *Eucalyptus molyneuxii* is known from only two small populations, both of which occur on deep siliceous sands in the central section of the Little Desert National Park in Western Victoria. The annual rainfall of the region is approximately 500 mm, most of which occurs in winter.

*Etymology:* The epithet honours W. M. (Bill) Molyneux of Dixon's Creek, Victoria, for his contributions to the taxonomy and understanding of several Victorian plant genera, including *Grevillea*, *Callistemon*, *Leptospermum* and *Acacia*, for his contributions of collected specimens of many genera of plants to various Australian herbaria, and for his many years of pioneering work in the cultivation of native plants. Bill was also a member of the environmental action group which campaigned against the opening up of the Little Desert for farming during the late 1960's. Such action led to the establishment of the Little Desert National Park and appears to have saved this species from extinction.

*Associated species:* *Eucalyptus arenacea* Marginson & Ladiges, which is a dominant species throughout the Little Desert, occurs adjacent to but not with the new species. Other species within the vicinity include *E. wimmerensis* K Rule *E. sabulosa* K. Rule, *E. leptophylla* F.Muell. ex Miq., *E. incrassata* Labill. and *E. leucoxydon* F. Muell. subsp. *stephaniae* K Rule.

*Conservation status:* Both of the known populations of *E. molyneuxii*, each of which consist of about a dozen plants, are secure in the Little Desert National Park. Evidence of charred trunks suggest that the species copes with fire but, nonetheless, its situation is highly vulnerable. In accordance with Briggs & Leigh (1989) a status of 2V is suggested.



**Fig. 1.** Illustration of *Eucalyptus molyneuxii*. **a** juvenile leaves ( $\times 1$ ), **b** adult leaf ( $\times 1.5$ ), **c** intermediate leaves ( $\times 1$ ), **d** bud ( $\times 2.5$ ), **e** inflorescence ( $\times 2$ ), **f** fruit cluster ( $\times 1$ ), **g** fruit ( $\times 3$ )

**Key to Victorian peppermints**

1. Bark hard, compact, occurring on lower trunk; decortivating bark hanging in long ribbons from trunk and major branches; forest trees of East Gippsland (and South-east NSW) or smooth-barked mallees occurring on rocky ridges and slopes in the same region.....*E. elata*
1. Bark rough, short-fibred (peppermint type), occurring on at least lower trunk.
  2. Mature adult leaves dull, rough-surfaced, thin-textured; fruits thin-walled (disc to 1 mm wide).
  3. Adult leaves green; smallish forest and woodland trees of central Victoria (and the highlands adjacent to Sydney) .....*E. radiata*

3. Adult leaves greyish.
  4. Juvenile leaves linear-lanceolate; adult leaves narrow-lanceolate (0.8–1.5 cm wide); tallish forest trees of north-eastern Victoria (and south-eastern NSW) .....*E. robertsonii* (syn. *E. radiata* subsp. *robertsonii*)
  4. Juvenile leaves broad-lanceolate or ovate; adult leaves lanceolate or broad-lanceolate (1.4–3 cm wide); smallish forest trees of east and central Gippsland (and the south coast of NSW) .....*E. croajingolensis*
2. Mature adult leaves lustrous or sublustrous, smooth-surfaced, coarse-textured; fruits thick-walled (disc wider than 1 mm).
  5. Juvenile leaves cordate or broad-ovate, to 7 cm wide, usually waxy, sometimes connate; small trees and mallees throughout the Great Dividing Range of Victoria (and NSW) .....*E. dives*
  5. Juvenile leaves broad-lanceolate or ovate or narrower, to 3 cm wide, never waxy, never connate.
    6. Juvenile leaves green; branchlets not pendulous; fruits sessile or subsessile; small mallees and trees of the Little Desert .....*E. molyneuxii*
    6. Juvenile leaves greyish; branchlets pendulous; fruits distinctly pedicellate.
      7. Fruits 4–5 mm long, 4–6 mm wide; small trees and mallees of Wilson's Promontory .....*E. willisii sens. strict.*
      7. Fruits 5–7 mm long, 6–9 mm wide.
        8. Juvenile leaves narrow-lanceolate; adult leaves 0.8–1.4 cm wide ....  
..... *E. willisii* (Gippsland Lakes Form)
        8. Juvenile leaves broad-lanceolate or ovate; adult leaves 1.8–3.5 cm wide; small woodland trees and mallees throughout the Grampians and of coastal and subcoastal habitats of south-western Victoria (and Lower South-east S A) ..... *E. willisii* subsp. *falciformis*

## Discussion

*Eucalyptus molyneuxii* exhibits most of the features of *Eucalyptus* Series *Radiatae* Chippendale, which include: Bark being short-fibred (peppermint type); conspicuous verrucae on seedling stems; juvenile leaves that are decussate, opposite, sessile for numerous pairs and rich in oil glands; adult leaves symmetrical with acute lateral veins and numerous scattered island glands within relatively large areoles; inflorescences containing relatively large numbers of clavate-like floral buds; and hemispherical or obconical fruits with relatively broad, flattened discs approximately at rim level. The thick-walled fruits (in relation to fruit size) place *E. molyneuxii* within Superspecies *Dives* Marginson, Ladiges and Brooker, the so-called shining peppermints. *Eucalyptus molyneuxii* is distinguished from other mainland shining peppermints by the following combination of morphological features: Its small, often mallee habit; thin, often loose peppermint bark; non-pendulous branchlets (a feature possessed by other eucalypts occurring in its semi-arid habitat); appreciably narrow, falcate (by 10–15 pairs), non-amplexicaul, sub-lustrous, green juvenile leaves; relatively small, lustrous, green adult leaves with widely scattered oil glands; 11–15-flowered inflorescences; subsessile or shortly pedicellate buds; and smallish, sessile or subsessile fruits with relatively broad discs and small orifices. Furthermore, its desert-like habitat of deep, well-drained siliceous sands, is atypical of the peppermints at large, which favour cooler, more moist conditions.

*Eucalyptus molyneuxii* is related to *E. willisii* subsp. *falciformis* on the basis of some shared features in both juvenile and adult leaves. In both taxa, the juvenile leaves are always non-amplexicaul and become falcate and vertically-oriented at a relatively early stage compared with others of the group. As well, their adult leaves have widely scattered oil glands and are relatively coriaceous. However, *E. willisii* subsp. *falciformis* differs by

its habit that is pendulous; juvenile leaves that are broader (to 12 cm long, 5 cm wide) and greyish; adult leaves that are larger (to 17 cm long, 3.5 cm wide), usually duller and blue-green; and fruits that are larger (5–7 mm long, 6–8 mm wide) and borne on longer pedicels (4–7 mm long). In western coastal and subcoastal populations, however, juvenile leaves differ from *E. molyneuxii* in not only being broader and duller, but in being amplexicaul in early development.

*Eucalyptus willisii sensu stricto.*, also regarded as a relative of *E. molyneuxii*, has similar-sized buds and fruits, but differs by a habit that is pendulous; juvenile leaves that are broader (to 3 cm wide), duller, horizontally-oriented and amplexicaul for numerous pairs; adult leaves that are generally larger (to 15 cm long, 2 cm wide), considerably thinner (0.18–0.28 mm), duller and have visibly more crowded oil glands; inflorescences that carry a greater number of buds (15–25); and the fruits usually have longer pedicels (2–4 mm long). The Gippsland Lakes form of *E. willisii* also has some features in common with the new species, particularly its lustrous, green, smallish adult leaves, but differs by its habit that is pendulous; juvenile leaves that are duller and horizontally oriented; adult leaves that are thinner (0.30–0.39 mm) but with a greater density of oil glands; and fruits that are larger (5–6 mm long, 6–9 mm wide) and borne on longer pedicels (3–6 mm long).

*Eucalyptus dives* also differs from *E. molyneuxii* in a wide range of characters. It has a habit that is pendulous; juvenile leaves that are horizontally-oriented, amplexicaul, often waxy, sometimes connate and broader (to 10 cm long, 7 cm wide); adult leaves that are larger (to 15 cm long, 3.5 cm wide) duller and bluish; and fruits that are larger (5–6 mm long, 6–8 mm wide) and borne on longer pedicels (3–5 mm long).

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