

Eucalyptus ovata Swamp Gum

TAXONOMY

Division	Angiosperm (flowering plant)
Subclass	Dicotyledonae (dicotyledon)
Family	MYRTACEAE

Previous Taxonomic Names

Current taxonomic name *Eucalyptus ovata* has been in use since 1806.

E. ovata var. *grandiflora* has been current since 1916.

E. ovata var. *ovata* is current since 1916 for *E. gunii* varieties, *E. muelleri*, *E. paludosa* and *E. stuartiana*.

The species was reviewed by Brooker (2000). Victorian eucalypts are currently being reviewed by Kevin Rule (K Rule 2005, pers. comm.).

Taxonomic Status

Long lived woody perennial.

Common Names

Swamp Gum, White Gum, Black Gum, Blue leaved Sally, Marrawah Gum (ANBG n.d.)

MORPHOLOGY

Tree to 20 m tall, bark varies from smooth throughout to rough and loose over most of the trunk. Juvenile leaves on stalks, alternate, elliptic to ovate in shape, to 19 cm long, 8.5 cm wide, dull green in colour. Adult leaves on stalks, alternate, ovate to broadly lanceolate in shape, with a slightly undulating or wavy surface, to 9-17 cm long, 2-3.5 cm wide, glossy green in colour with a dense network of visible veins, generally lacking visible oil glands. 7-flowered, buds on stalks, diamond-shaped with a scar present and conical cap. Fruit on stalks, obconical in shape, with disc level, raised or ring like. 3-4 valves to rim level (Walsh & Entwisle 1996).

SUBSPECIES

Two varieties are recognised, with both occurring in Victoria:

- ***E. ovata* var. *ovata*** - Buds to 0.9 cm long, 0.6 cm diameter. Fruit to 0.8 cm long, 0.8 cm diameter. Leaves without, or with few oil glands. Flowers Jun-Sep (Walsh & Entwisle 1996).
- ***E. ovata* var. *grandiflora*** - Buds to 1.5 cm long, 0.9 cm diameter. Fruit to 1 cm long, 1.3 cm diameter, leaves with prominent oil glands. Recognisable by larger leaves, buds and fruit, and prominent oil glands on leaves. Flowers Jun-Sep. (Walsh & Entwisle 1996).

There is no clear distinction between the taxa of *E. ovata* var. *grandiflora* and var. *ovata*, with several populations in south-west Victoria being intermediate between the two (Walsh & Entwisle 1996).

HYBRIDS

E. ovata is thought to form natural hybrids with *E. nitens* Shining Gum (Barbour et al 2002), *E. camaldulensis* River Red Gum (Griffin et al 1988), *E. viminalis* Manna Gum (Ladiges & Ashton 1974), *E. brookeriana* Brooker's Gum (Walsh & Entwisle 1996), *E. crenulata* Buxton or Silver Gum (Simmons & Parsons 1976) and several eucalypts indigenous to South Australia and Tasmania (Clucas & Ladiges 1978). Hybridisation with *E. globulus* Blue Gum is rare (Lopez et al 2000).



In Gippsland and the lower Otway Range on the coast, there are populations intermediate between *E. brookeriana* and *E. ovata*. Typically these trees have a rough barked base for about 4 m. The juvenile leaf is wavy, elliptic to oval in shape with visible oil glands and the under surface is a different colour to the top of the leaf. The broadly lanceolate adult leaves have few or no oil glands, and buds and fruit typical of *E. ovata*. (Walsh & Entwisle 1996).

E. ovata will hybridise with *E. nitens* Shining Gum. Within 300 m of *E. nitens* plantations high hybridisation levels (5-16%) were found in trees sampled within 150 m of the plantation (Barbour et al 2002).

Ladiges and Kelso (1977) thought it possible that the genetic variation in *E. viminalis* (such as tolerance to waterlogging and more ovate juvenile leaves) at Durdidwarrah in the Brisbane Ranges, may indicate past hybridisation with *E. ovata*.

SIMILAR SPECIES

Eucalyptus brookeriana Brooker's Gum - *E. brookeriana* is primarily a Tasmanian species, but its natural range includes the northern foothills of the Otway Ranges and the Trentham area (Walsh & Entwisle 1996).

E. ovata is typical of lower altitudes (<200m) and occurs in open forests on heavy soils of seasonally waterlogged flats. *E. brookeriana* occurs at higher altitudes (often > 400m) on better drained soils of ridges and plateaux, frequently forming tall open forests (wet sclerophyll) with *E. regnans* (Ladiges et al 1981).

E. brookeriana flowers during summer and autumn, and its leaves have a higher oil content when compared to *E. ovata* (Walsh & Entwisle 1996).

GEOGRAPHIC RANGE

- ***Eucalyptus ovata* var. *ovata*** - widespread and common throughout southern Victoria on poorly drained, infertile sites. The distribution of this, the typical form of *E. ovata* is not well defined, and populations of intermediates between *E. ovata* and *E. brookeriana* are likely to be included in current range information for *E. ovata* var. *ovata*. A form near Moonlight Head & Cape Otway occurs on better drained, exposed sites, and has coarser, larger buds and fruits approaching those of *E. ovata* var. *grandiflora*. Also NSW, ACT, SA and TAS (Walsh & Entwisle 1996).
- ***Eucalyptus ovata* var. *grandiflora*** - restricted to west and north-west of Portland in Victoria and south-east corner of South Australia. Occurs outside of the Corangamite catchment.

BIOREGIONS

Central Victorian Uplands
Warrnambool Plain

Otway Plain
Victorian Volcanic Plain

Otway Ranges

PLANT COMMUNITIES

Eucalyptus ovata occurs in a wide range of ecosystems from dry forests to wet forests, grassy woodlands, riparian scrubs and wetlands.

FRAGMENTATION

No data found but thought to be more recent than historic (since European history).

RELEVANT HISTORY & RESEARCH

Clucas and Ladiges (1979) study of *E. ovata* from four Victorian sites (Tower Hill, Otways, Durdidwarrah & Yarragon) found significant morphological variation. Variation was attributed to both genetic & ecological factors although seedlings from all four sites responded to soil types and waterlogging in the same manner. The researchers hypothesised that other variations such as leaf and fruit shape may be the result of past hybridisation.

Withers (1979) undertook extensive studies of an unburnt woodland at Ocean Grove, Victoria, which had been originally dominated by Eucalypt species, but at the time of the study was being overtaken by *Allocasuarina*. One of the findings from her study was that moderate shade treatment of 30% of full daylight decreased the drought resistance of the species, and deep shade treatment of 8% of full daylight decreased this resistance further. This means that it is more difficult for *E. ovata* to establish

under the shade conditions produced by a denser upper canopy, such as that produced by *Allocasuarina littoralis* at the study site.

Lunt's (1998) follow up study of the same site found that the *E. ovata* population had continued to decline, while other species, particularly *A. littoralis* significantly increased in numbers.

A Tasmanian study undertaken by Barbour and colleagues (2003) found that hybrids are forming between indigenous *E. ovata* populations and *E. nitens* plantations. The majority of hybrids were found within 20 m of the plantation boundary, but their distribution extended up to 310 m. In comparison, all *E. nitens* wildings were found within 30 m of the plantation, with most occurring within 10 m. Hybrids between plantation *E. nitens* and the locally occurring Eucalypt species were more common than any hybrids occurring between indigenous species. Hybridisation levels were 5.5% between *E. ovata* x *nitens* compared to 0.4% amongst locally occurring species.

BREEDING SYSTEMS

FLOWERING

White flowers June-September (Walsh & Entwisle 1996).

POLLEN

Moderate pollen yield (Gowers 1990).

POLLINATION

Self-pollination does occur, but with a high level of inbreeding depression (Lopez et al 2000).

POLLINATORS

Insects, birds, bees (Bonney 2003).

Small mammals - the Feathertail glider, Sugar glider & Eastern Pygmy-possum are known to pollinate *Eucalyptus* species (Turner 1982).

SEED

SEED DESCRIPTION

Seed brown-black in colour and flattened-ellipsoid in shape (Walsh & Entwisle 1996).

Published seed estimates vary:

- 444-625 seeds per gram (GAV n.d.).
Approximately 716 seeds/gram (Gowers 1990).
- 650 viable seeds/gram (Ralph 2003).
546 viable seeds/gram (Turnbull & Doran 1987).
Average of 594 germinants/gram at 25°C (Gunn 2001).

SEED CROP

Peak season is from February to March but seed may be collected from early October to late March (Earl et al 2001).

SEED DISPERSAL

Insects, birds, wind (Bonney 2003).

Ants (Withers 1978)

EXTRACTION & STORAGE

Fruit should be dried to induce seed release and sieved to clean (Ralph 1994; Bonney 2003).

Capsules will usually open within a week or so in warm weather (Bonney 2003).

Seed in storage at 18-22 °C recorded a germination rate of 100% viability after 5 years storage, dropping to 37% after 10 years (Gunn 2001).

PROPAGATION

Easy to propagate from seed (GAV u.d.).

Sow seed from springtime, keep moist (Bonney 2003).

Optimum germination temperature: 25°C (Turnbull & Doran 1987).

Germination is significantly delayed by the presence of *Allocasuarina littoralis* litter (Withers 1978).

GERMINATION TIME

Germination from seed collected from Ocean Grove was almost complete after 10 days at a constant temperature of 26°C (Withers 1978).

TREATMENT OPTIONS

Smoke treatment and stratification at 4-5°C for one week has been found to enhance germination for a number of Eucalypt species (Ralph 2003).

FIELD ESTABLISHMENT

Very successfully direct seeded (GAV n.d.).

For broad-acre revegetation work, sow seed in spring over a clean, lightly tilled soil bed and press in (Bonney 2003).

Natural regeneration from seed and a lignotuber (Lunt 1998).

Natural regeneration from seed occurs if pasture competition is reduced and grazing pressure (from stock and rabbits) ceased (Earl et al 2001).

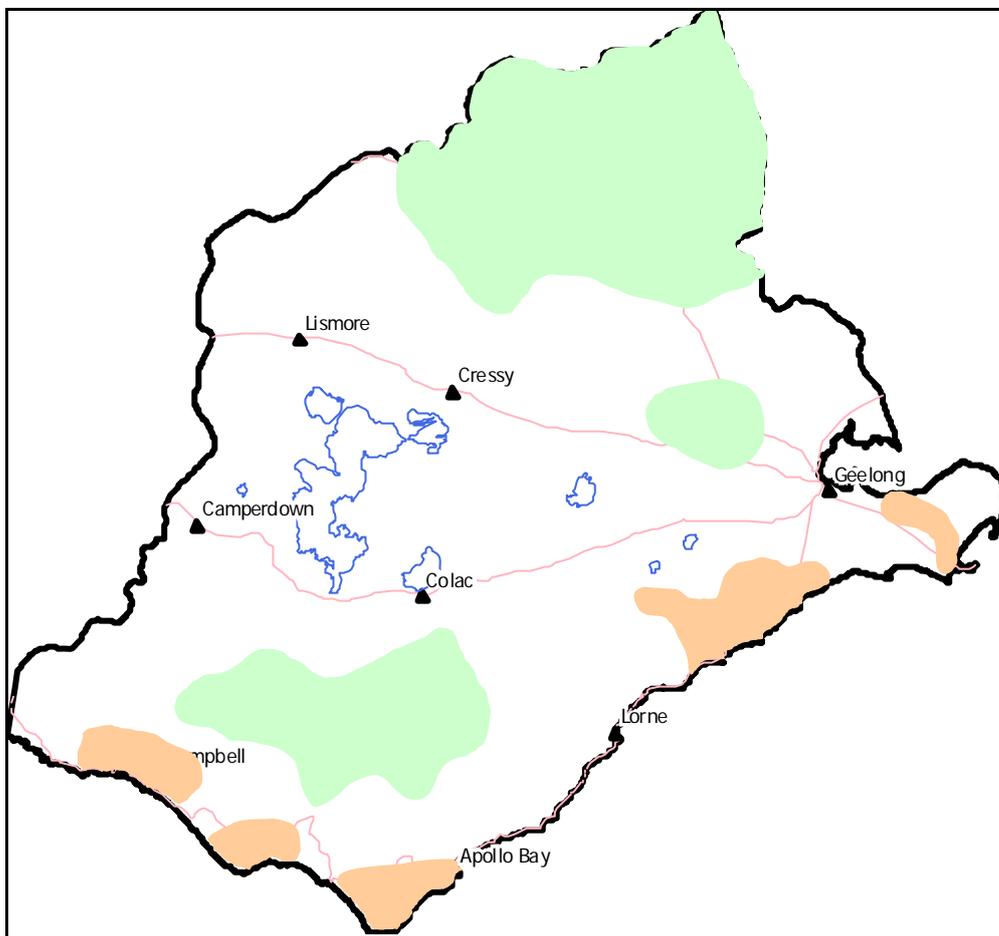
E. ovata var. *ovata* coppices well (Earl et al 2001).

SEED COLLECTION RANGE - *Eucalyptus ovata* var. *ovata*

Narrow - within which, seed should be collected from remnant stands that are close to the revegetation project.

While widespread, variations in form of *Eucalyptus ovata* occur across the region. Research suggests that there are provenance variations which are both environmentally and genetically influenced. Hybrids are also common. Consideration should be given to:

- Ensuring collection from large, healthy stands of non-hybridised *Eucalyptus ovata*
- Clearly separate *E. ovata* collection from *E. brookeriana* where these occur together
- Keep collection within distinct population zones
- Collect from at least 30 plants and from around the canopy.
- Supplement collection over a number of years.



MAP: *Eucalyptus ovata* distribution

DATA SOURCE: DSE Flora Information System May 2005, accessed May 2006

- Remnant inland populations
- Coastal populations

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