
1 **Supplementary Material 1:**

2 Species descriptions and sample details

3
4 Associated paper: Assessing a Bayesian approach for detecting exotic hybrids between
5 plantation and native eucalypts

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9
10 *Eucalyptus camaldulensis* (subgenus *Symphyomyrtus*, section *Exsertaria*, series *Rostratae*).

11 *Eucalyptus camaldulensis* is the most naturally widespread eucalypt species, and one of the
12 most widely cultivated outside Australia [1]. It is a common, often dominant, water course
13 and flood plain tree covering a range of climatic zones across continental Australia [Fig. 1;
14 2]. There are seven recognised subspecies that are more-or-less geographically structured,
15 and intergrade populations are known to occur where the distributions meet [2]. Generally *E.*
16 *camaldulensis* is a large tree with smooth bark, seven flowered inflorescences and has fruit
17 with an ascending disc and very exert valves [2]. There is considerable variation in leaf and
18 bud morphology across the seven subspecies, but distinctively, all have yellow-brown
19 double-coated seeds [2]. The species is common around *E. globulus* plantations in western
20 Victoria and the Green Triangle. In this area the natural distribution of *E. camaldulensis* is
21 highly fragmented, with remnant populations often occurring directly adjacent to, and
22 embedded within *E. globulus* plantations. Of the 97 *E. camaldulensis* DNA samples used in
23 this study 92 were from Butcher *et al.* (2009), and cover the full geographic range of the
24 species; an additional two samples were collected from open pollinated progeny collected
25 from trees within the plantation zone in the Green Triangle, two samples were collected from
26 Currency Creek Arboretum (CCA), with one sample sourced from existing collections from
27 Petford in Queensland.

28 *Eucalyptus cypellocarpa* (subgenus *Symphyomyrtus*, section *Maidenaria*, series *Globulares*,
29 subseries *Remanentes*)

30 *Eucalyptus cypellocarpa* is common and widespread in coastal and inland ranges from
31 northern New South Wales, south to eastern and central Victoria, with outlying populations
32 in the Grampians and Otway Ranges in western Victoria [2]. It is typically a tall wet forest
33 tree to 65m, and also occasionally occurs as a mallee at the extremes of its range [2]. It has
34 smooth bark, long lanceolate leaves and inflorescences are in umbels of seven with buds and
35 fruit often having a longitudinal ridge. The juvenile foliage is striking, with large opposite
36 sessile leaves on square to winged stems [2], and can resemble the juvenile foliage of *E.*
37 *globulus* and *E. nitens*. In fact the three species are all occur in the same series [2], and given
38 their similar juvenile characteristics, hybrids between these three species would be difficult to
39 detect based on juvenile morphology. *Eucalyptus cypellocarpa* and *E. globulus* naturally co-
40 occur and hybrids between the two have been reported [3, 4]. *Eucalyptus cypellocarpa*
41 occurs in the vicinity of industrial *E. globulus* plantations mainly in the Strzelecki Ranges in
42 Gippsland Victoria, where it is a common component of native forests adjacent to
43 plantations. Ninety-eight individuals from 26 populations across the range of *E. cypellocarpa*
44 were sampled in this study. Leaf tissue and herbarium specimens were collected from three to
45 five individuals per population.

46 *Eucalyptus globulus* (subgenus *Symphyomyrtus*, section *Maidenaria*, series *Globulares*,
47 subseries *Euglobulares*)

48 *Eucalyptus globulus* is common in coastal and sub-coastal and inland forests below 700m in
49 eastern Tasmania, southern Victoria and the Bass Strait Islands with outlying populations in
50 western Tasmania [2]. The species is often tall (up to 90 m) and has smooth bark, large
51 falcate leaves and usually single budded influences [occasionally in 3s; 5] that are large,
52 warty and ribbed [2]. The juvenile foliage is conspicuous with large sessile opposite and
53 highly glaucous leaves on square and winged stems [2]. This characteristic juvenile foliage
54 has been exploited as morphological marker for identifying juvenile hybrid seedlings
55 involving *E. globulus* [6, 7]. It is one the most economically important temperate hardwood
56 species in the world and is widely planted across southern mainland Australia in industrial
57 plantations [8, 9]. *Eucalyptus globulus* plantations occur within its native range in Gippsland
58 and south-eastern Tasmania (Fig. 1). Of the 87 *E. globulus* DNA samples used in this study,
59 79 were provided by Hudson [10], and cover the full geographic range of the species. The
60 remaining eight samples were sourced from existing UTAS collections.

61 *Eucalyptus nitens* (subgenus *Symphyomyrtus*, section *Maidenaria*, series *Globulares*,
62 subseries *Remanentes*)

63 *Eucalyptus nitens* has a disjunct natural distribution occurring in scattered populations in
64 highland wet forests in Victoria and New South Wales [2]. It is a tall tree (to 70 m) with
65 mainly smooth bark, glossy green lanceolate to falcate leaves, small buds in umbels of seven
66 that are angular [2]. *Eucalyptus nitens* has not been as widely cultivated as *E. globulus*, but is
67 particularly important in Tasmania where its superior frost resistance is exploited at high
68 altitudes [8, 11, 12]. Like *E. globulus* the juvenile foliage is conspicuous with large sessile
69 opposite and glaucous leaves on square and winged stems, but *E. nitens* juveniles can be
70 distinguished from *E. globulus* by their fused apical buds [2]. The species does not naturally
71 occur within the main *E. globulus* planting zone but *E. nitens* plantations do occur within the
72 native distribution of *E. globulus* and *E. cypellocarpa* in Gippsland and *E. ovata*, *E. viminalis*
73 and *E. globulus* Tasmania. The 94 *E. nitens* DNA samples used in this study were provided
74 by Hudson [10], and cover the full geographic range of the species.

75 *Eucalyptus ovata* (subgenus *Symphyomyrtus*, section *Maidenaria*, series *Foveolatae*)

76 *Eucalyptus ovata* is widespread and common in poorly drained sites across south-eastern
77 Australia, from Kangaroo Island in the west to the Southern Tablelands of New South Wales
78 in the east, and south to Tasmania [2]. It is a small to medium sized tree (6 -25 m) that is
79 sometimes multi-stemmed. The bark can be smooth throughout or have loose rough slabs
80 extending up the trunk [2]. Buds are in umbels of seven, adult leaves are lanceolate to ovate,
81 and juvenile leaves are petiolate and alternate by node four to six [2]. There are two
82 subspecies recognised, the widespread subsp. *ovata* and subsp. *grandiflora* which has larger
83 buds and fruit and prominent oil glands in the adult leaves, and is restricted to far south-west
84 Victoria and the south-east tip of South Australia [13]. *Eucalyptus ovata* co-occurs with *E.*
85 *globulus* in Tasmania and Victoria and naturally occurring hybrids between the species were
86 among the first recognised in *Eucalyptus* [14]. The species is also very common in plantation
87 landscapes, especially in the Green Triangle, where it commonly occurs as remnant forest
88 patches adjacent to and embedded within *E. globulus* plantations [Fig. 1; 6]. Of the 100 *E.*
89 *ovata* DNA samples used in this study, 83 were provided by Marthick [15], which covered
90 the full range of the species, and 17 additional samples were collected from populations
91 within the plantation zone in the Green Triangle and Gippsland in Victoria.

92 *Eucalyptus viminalis* (subgenus *Symphyomyrtus*, section *Maidenaria*, series *Viminalales*,
93 subseries *Lanceolatae*)

94 *Eucalyptus viminalis* is widespread in wet or seasonally wet sites across south eastern
95 Australia from the Eyre Peninsula through South Australia, Victoria, Tasmania, and
96 extending as far north as the Northern Tablelands of New South Wales [2]. It is a tree with
97 incredible variation in form, from a small coastal mallee to a tall forest tree to 90 m [2]. The
98 bark is smooth and white with a persistent stoking of rough bark at the base, sometimes
99 extending up the trunk. The inflorescences are in threes or sevens (see below), adult leaves
100 are laneolate to falcate, while juvenile leaves are lanceolate opposite and sessile for many
101 pairs [2]. There are four subspecies, of which two (subsp. *viminalis* and subsp. *cygnetensis*)
102 are common in the *E. globulus* plantation zone in south-eastern mainland Australia [Fig. 1;
103 2]. Subspecies *cygnetensis* occurs mainly in South Australia and south-western Victoria and
104 has fruits usually in sevens, with rough bark extending further up the trunk than subspecies
105 *viminalis* [2]. *Eucalyptus viminalis* naturally co-occurs with *E. globulus* and occasional
106 hybrids have been reported between the two species [16]. Of the 89 *E. viminalis* DNA
107 samples used in this study, 87 were from Marthick [15] and covered most of the species
108 range including the main plantation growing areas. An additional two samples were also
109 collected from Tinderbox in southeast Tasmania.

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