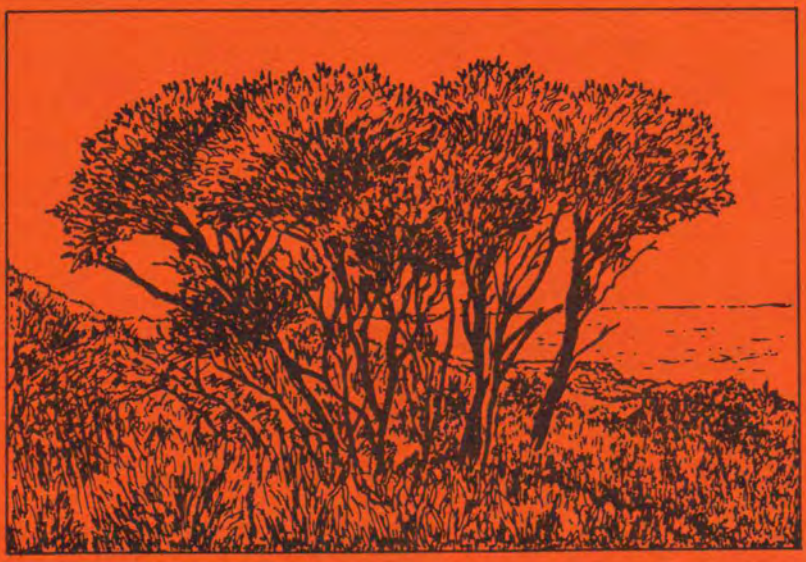
SURVEY OF RARE AND POORLY KNOWN EUCALYPTS OF WESTERN AUSTRALIA

Field Guide No. 5

Forests and Metropolitan Regions



BY

ANNA NAPIER, ANNE TAYLOR AND STEPHEN HOPPER

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FORESTS AND METROPOLITAN REGIONS

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ANNA NAPIER, ANNE TAYLOR AND STEPHEN HOPPER

WESTERN AUSTRALIAN WILDLIFE RESEARCH CENTRE,
P.O. BOX 51, WANNEROO, W.A. 6065

LINE DRAWINGS
BY
SUSAN PATRICK

WESTERN AUSTRALIAN DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

1988

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INTRODUCTION

This interim field guide has been produced to assist contributors to the "Survey of Rare and Poorly Known Eucalypts of W.A." to identify the species of interest. As the list of such species is large, it has been subdivided into different State regions. This booklet covers the Forests and Metropolitan Regions, as defined by the Western Australian Department of Conservation and Land Management (see Fig. 1). Other booklets cover other C.A.L.M. regions.

Figure 1

Eucalypts have been the subject of recent name changes and taxonomic research. This field guide is the most up-to-date reference available for rare and poorly known eucalypts of the Region, including new species and subspecies whose names have not yet been published. For information on such taxa, we have relied heavily on the unpublished "Field Guide to Eucalypts Vol. 2" by M.I.H. Brooker and D. Kleinig. We are indebted to the authors for allowing access to their manuscript. We have also drawn heavily on the unpublished research results of Ian Brooker, Lawrie Johnson, Ken Hill, Don Blaxell and Stephen Hopper to whom we are grateful for assistance. Because of the active phase of research occurring on eucalypts, this field guide is very much an

interim report. Undoubtedly, new taxa warranting inclusion in the study will be discovered during the course of the survey.

Common eucalypts of the South Coast Region can best be identified using Gardner's "Eucalypts of Western Australia" and Blackall and Grieve's "How to Know Western Australian Wildflowers, Part IIIA".

Funding for this field guide and the Rare and Poorly Known Eucalypt Survey has been provided by the Australian National Parks and Wildlife Service and the Western Australian Department of Conservation and Land Management. We are grateful to the Curator, Western Australian Herbarium, for providing access to specimens and to Paul Gioia of the Western Australian Wildlife Research Centre for FLORAPLOT computer mapping.

Species' Description and Illustrations

The species are listed in alphabetical order. Unpublished taxa of L. Johnson and K. Hill are given a three letter code and referred to as aff. (with affinity to their nearest named relative). Unpublished taxa of Brooker and Hopper are given as manuscript names enclosed in parentheses. For each species (or subspecies), the main identifying features of the plant are indicated on the drawings. Other features, including those which can only be seen in the field are included under "Additional Field Characteristics". If there are similar eucalypts with which the species in question can be confused, these are indicated and their distinguishing features highlighted. In cases where a similar species is common and is thus not included in the field guide, full details of the comparison are given. If a similar species is rare, and is included in the field guide, only a brief comparison is provided. Further details can be found on the relevant page for that species.

All illustrations have been drawn using material from the W.A. Herbarium or from other collections. As it is not possible to show the slight variations of ornamentation which may occur within a species, the most representative specimens have been drawn.

Location Maps

The location maps have been produced from records of specimens lodged at the Western Australian Herbarium, from personal records of M.I.H. Brooker and S.D. Hopper and from information supplied by various wildlife officers and individuals as recorded on the Department of Conservation and Land Management species files. The maps have been compiled on the FLORAPLOT Computer System at the W.A. Wildlife Research Centre.

The maps of species' location are given as a general guide and should not be regarded as covering the entire range of the species.It is hoped that the present survey will either extend the known range or verify the restricted occurrence of certain species. It is also possible that some previously recorded populations or individuals may have disappeared as a result of agricultural clearing, or road widening, or other factors.

Collecting Specimens

Since eucalypts can be difficult to identify and also since we are only looking at rare and poorly known taxa for which confirmed identification is essential, we will be relying greatly on voucher specimens to confirm certain records.

A properly collected, well pressed and labelled specimen will be required in each of the following circumstances:

- For each 'new' species or subspecies recorded by a person e.g. when John Smith records *E. calcicola* for the first time, a voucher specimen is needed.

- For any species or subspecies located a significant distance from its nearest known location (consult the map scale each time as most maps are at different scales). "Significant" may be a few kilometres for an extremely localised species (e.g. *E. 'argutifolia'*), further for more widespread species.

- Whenever you are unsure of an identification.

The following guidelines suggest techniques for collecting and processing specimens so that they remain in a well preserved, identifiable state.

1. Do you have a collectors permit? This is needed before collecting specimens from publicly owned land. It can be obtained from the Senior Clerk Flora, Department of Conservation and Land Management, 50 Hayman Road, Como. On privately owned land, you should always seek the owners permission. Special Ministerial permits are required to collect Declared rare flora (see Table 1). These may also be applied for from the Senior Clerk Flora, Dept. of Conservation and Land Management, 50 Hayman Rd, Como, W.A.

E. beardiana	*E. steedmanii*
E. bennettiae	*E. suberea*
E. brevipes	*E. synandra* subsp. (wheatbelt)
E. burdettiana	*E.* sp. 'olivacea'
E. ceracea	*E.* sp. 'latens'
E. cerasiformis	*E.* sp. 'pruiniramis'
E. coronata	*E.* sp. 'bla'
E. crucis subsp. *crucis*	*E.* sp. 'crispata'
E. erectifolia	*E.* sp. 'phy'
E. insularis	*E.* sp. 'pla'
E. johnsoniana	*E.* sp. 'balanites'
E. lateritica	*E.* sp. 'absita'
E. merrickiae	*E.* sp. 'cuprea'
E. mooreana	*E.* sp. 'argutifolia'
E. rhodantha	*E.* sp. 'leprophloia'

Table 1. Declared Rare Eucalypts of W.A.

2. Collecting and Pressing

We recommend that you label each specimen collected with a unique number and your initials. For example, John D. Smith's collection of two eucalypt species at the first site he collects would be labelled JDS1 and JDS2. The same number should also be written in your field note book and on the relevant Sight Record Sheet, thus allowing future matching of specimens with recorded information. We also recommend that you collect in duplicate for each of your unique numbers. That is, enough material of each species to enable you to keep an adequate sample and to forward to the Survey Coordinators a duplicate (destined for the W.A. Herbarium) (see Fig. 2).

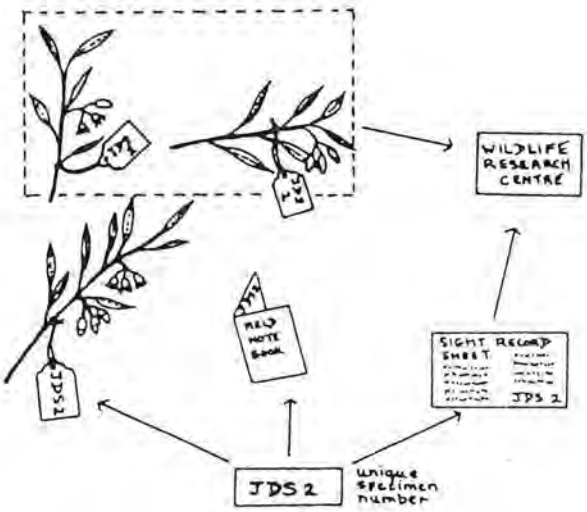


Figure 2. Labelling Plant Specimens

Collections should include leaves, buds and fruits and a small packet of fruits with the seeds enclosed. Where available, juvenile leaves from suckers near the base of the trunk should also be collected. If buds

are not available, a search on the ground may produce shed bud caps which are often an important aid in identification. Bark may be included if it is unusual.

As soon as possible after collection, plant parts should be put between sheets of newspaper, spread out so that they are clearly seen, and pressed. A simple press can be made from two sheets of any non-bending material, strapped together. Some sheets of cardboard, preferable smooth-sided corrugated cardboard, placed between the newspaper sheets will assist air circulation through the press. Drying of plant material occurs within the press and can be facilitated by keeping it in a warm room or in front of a heater and by changing the newspaper daily for the first few days, and then as conditions dictate. Most plants should dry in about a fortnight. Once dried, the plants should be placed between clean, dry sheets of newspaper and suitable measures taken to protect the specimens whilst they are in transit.

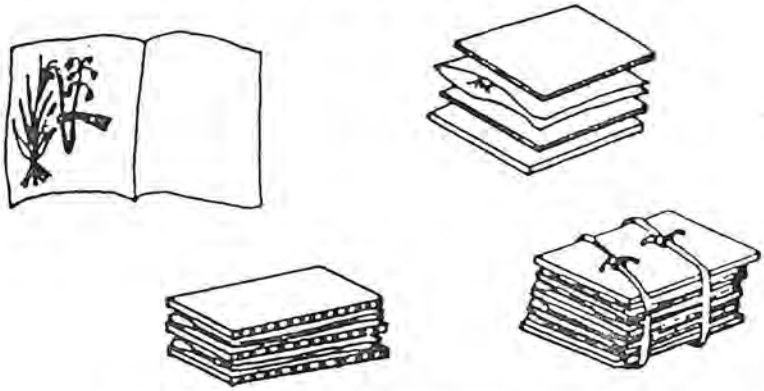


Figure 3. Pressing Plant Specimens

3. Specimen Label Slips

These are standardised recording slips which must accompany any specimen when it is submitted to a

herbarium. These can be filled in by either yourself or the Survey Coordinators (based on information contained on Sight Record Sheets). If you would like to fill in your own Specimen Label Slips, please contact Rare Eucalypt Survey Coordinators, W.A. Wildlife Research Centre, P.O. Box 51, Wanneroo, 6065.

4. Field Notebooks

We recommend the use of field notebooks when recording in the field, with all relevant data being later transferred to Sight Record Sheets. It is important that you make notes on most features illustrated in Fig. 4. when in the field, especially those difficult or impossible to observe on herbarium specimens (e.g. tree or mallee, habit, height, shape, bark features, leaf glossiness, leaf venation and oil gland pattern, presence of pith glands in branchlets, flower colour etc. Such information should be included on the Sight Record Sheets under "Additional Remarks". If there is insufficient space, please attach an additional sheet of paper. If you have collected a specimen, remember to include its unique number in your field note book for future reference.

5. Where to Send Duplicate Specimens for Identification

Please forward your duplicate specimens with relevant sight record sheets to:

Eucalypt Survey Coordinators
Wildlife Research Centre, C.A.L.M.
P.O. Box 51
Wanneroo W.A. 6065

The coordinators will ensure that your specimens are correctly identified, with the able assistance of botanists Ian Brooker and Stephen Hopper. As mentioned

above, the duplicate you send will be deposited in the Western Australian Herbarium.

6. Confidentiality

We urge contributors to be circumspect in divulging precise locations of the rarest of the eucalypts. Many of these are of considerable horticultural value, and some have been stripped entirely of mature fruits at particular sites by unscrupulous seed collectors in the past. If you consider that a given species might be at risk from such activities, please use general locations (e.g. Ravensthorpe district) when discussing or writing about your survey work. While we require very precise locations on computer sheets to ensure we can determine land status and ownership accurately, publications arising from this survey will not provide accurate details or maps for the rarest species.

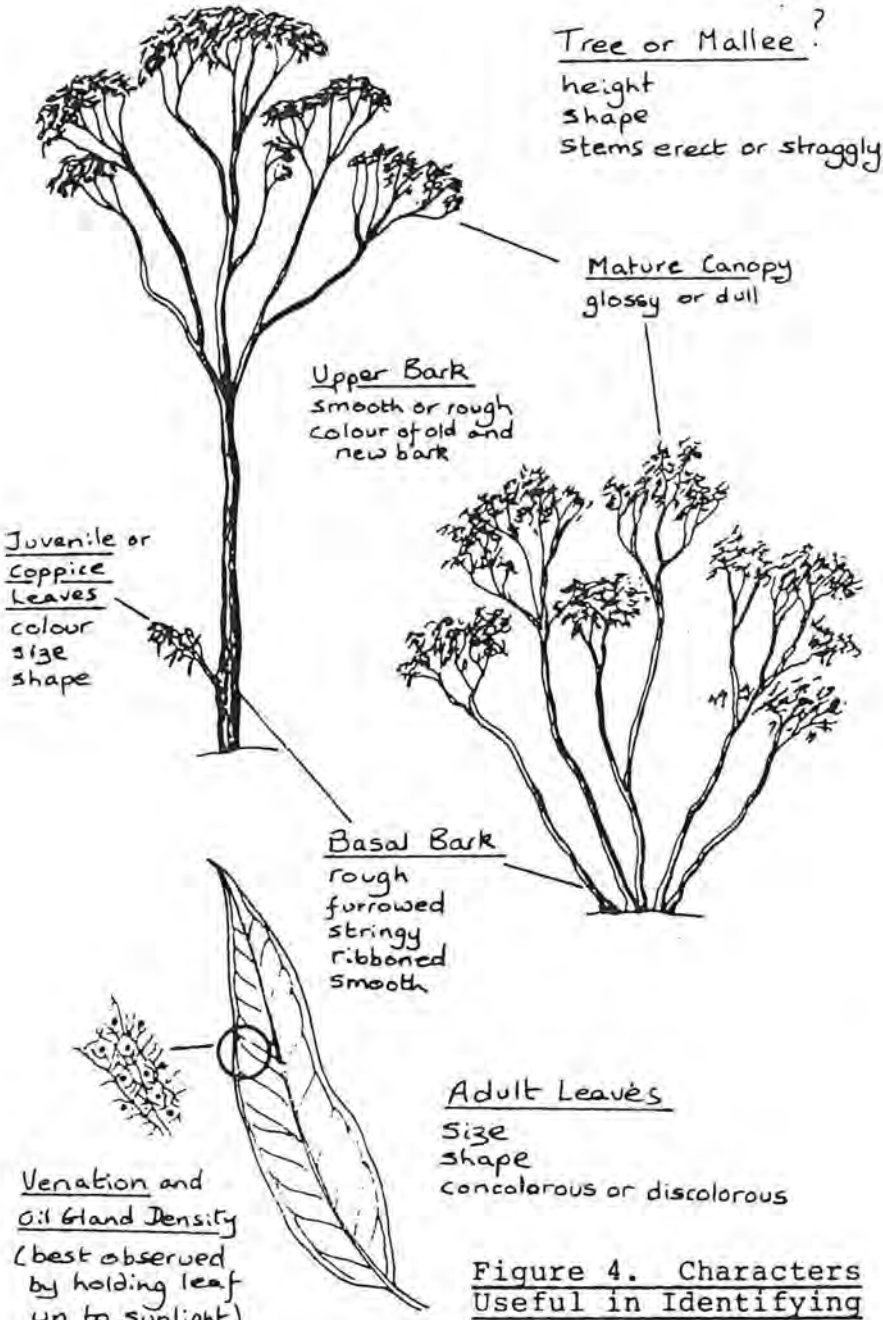
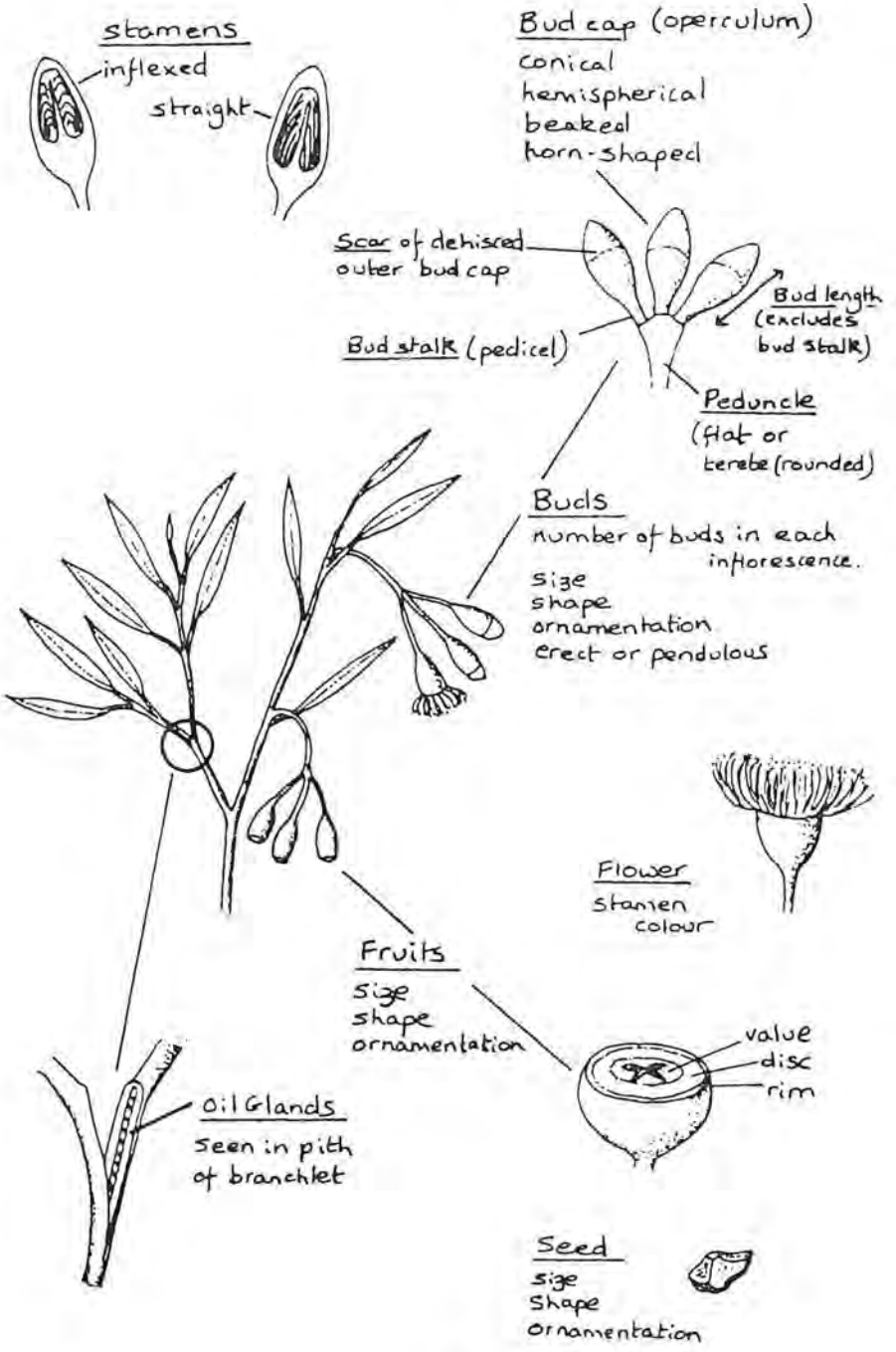


Figure 4. Characters Useful in Identifying Eucalypts


Stamens
inflexed
straight
Bud cap (operculum)
conical
hemispherical
beaked
horn-shaped
Scar of dehisced outer bud cap
Bud length (excludes bud stalk)
Bud stalk (pedicel)
Peduncle
(flat or terete (rounded)
Buds
number of buds in each inflorescence.
size
shape
ornamentation
erect or pendulous
Flower
stamen
colour
Fruits
size
shape
ornamentation
valve
disc
rim
Oil Glands
seen in pith of branchlet
Seed
size
shape
ornamentation

GLOSSARY OF TERMS USED

acute	ending in a sharp point
adnate	(of anthers) rigidly fixed at the base (see diagram below)
anthesis	the process of flowering
axillary	in the leaf axil; from where the leaf joins the branchlet
concolorous	leaf with upper and lower sides the same colour
cuboid	resembling a cube
discolorous	leaf with upper and lower sides a different colour
exserted	protruding from the top or opening of the fruit
fertile	(of stamens) having an anther
flanged	a projecting flat rim, collar or rib
glaucous	with a waxy coating giving a white, grey or blue-grey appearance
globoid	of the anthers, somewhat globular in form
hypanthium	the flower receptacle or lower part of the bud
inflorescence	cluster of flowers
mallee	shrub-mallee - has more than one trunk and each trunk is less than 10 cm in diameter tree-mallee - has more than one trunk and each trunk is more than 10 cm in diameter
mallet	small to medium sized tree, usually of steep-branching habit, sometimes fluted at the base of the trunk, and often with a conspicuously dense, terminal crown
obtuse	blunt or rounded at the apex
oil glands	minute oil containing structures seen near the surface of young stems, leaves, buds and fruits
operculum	the bud cap, the upper part of the bud which joins the hypanthium and covers the stamens

panicle	a much-branched inflorescence with flowers on stalks
peduncle	the stalk which holds the cluster of buds; may be terete, stout or flattened
pendulous	weeping habit or downturned
petiole	the leaf stalk which joins it to the branchlet
pith	the inner core of tissue of a plant stem
reticulation	the pattern of leaf veins
scar	the marking left on the bud when the first operculum is shed. If only one operculum is present no true scar is formed although a line of dying tissue which resembles a scar may appear near to flowering
sessile	without a stalk
staminode	a sterile stamen, one without an anther or with a reduced, non-functional anther
striated	marked with almost parallel longitudinal ridges
terete	rounded; used when descirbing stems, peduncles and petioles and referring to a cross-section
truncate	slightly cut off
venation	refers to the pattern of veins in the leaf
versatile	(of anthers) fixed at a central point and able to pivot (see below)

versatile

adnate

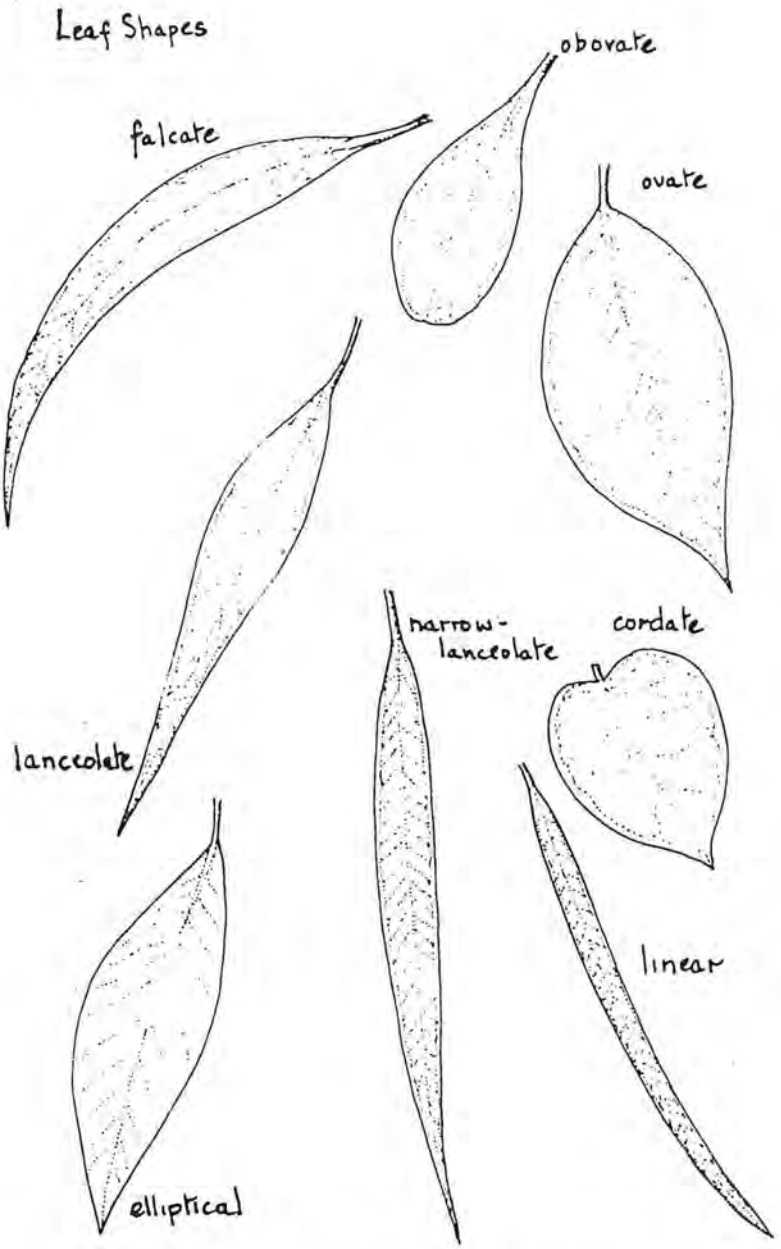
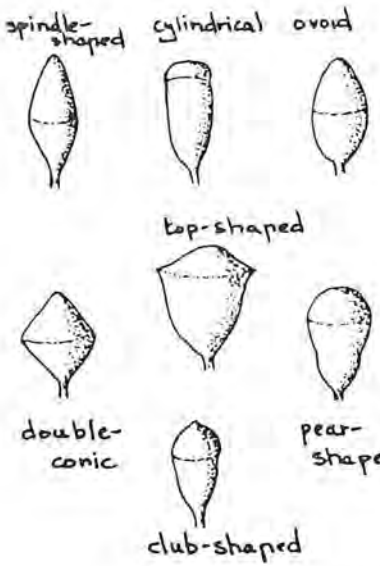
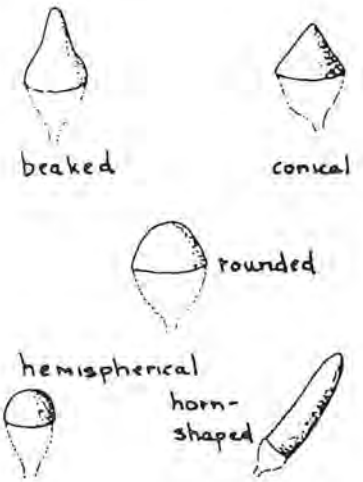


Figure 5. Leaf, bud and fruit shapes

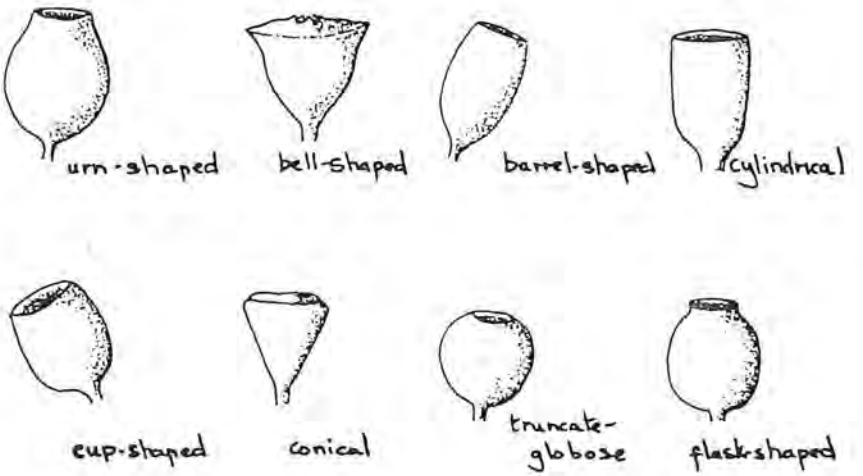
Bud Shapes



Bud Caps



Fruits



EUCALYPTUS 'ARGUTIFOLIA' Grayling and Brooker ined.

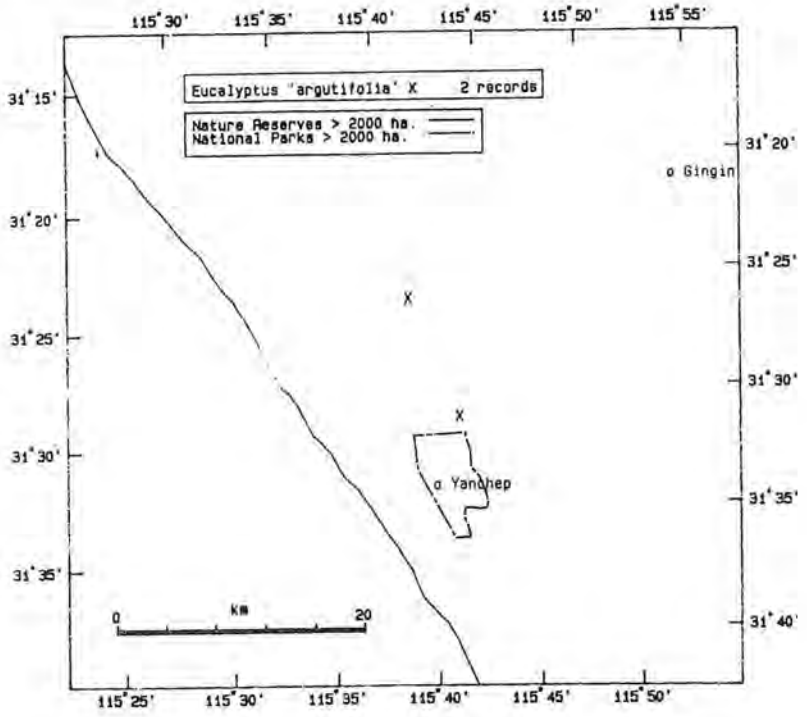
Distribution and Habitat: Known only from two locations north of Yanchep growing in shrubland on hilltops. Recorded with *E. foecunda* and *E. decipiens*.

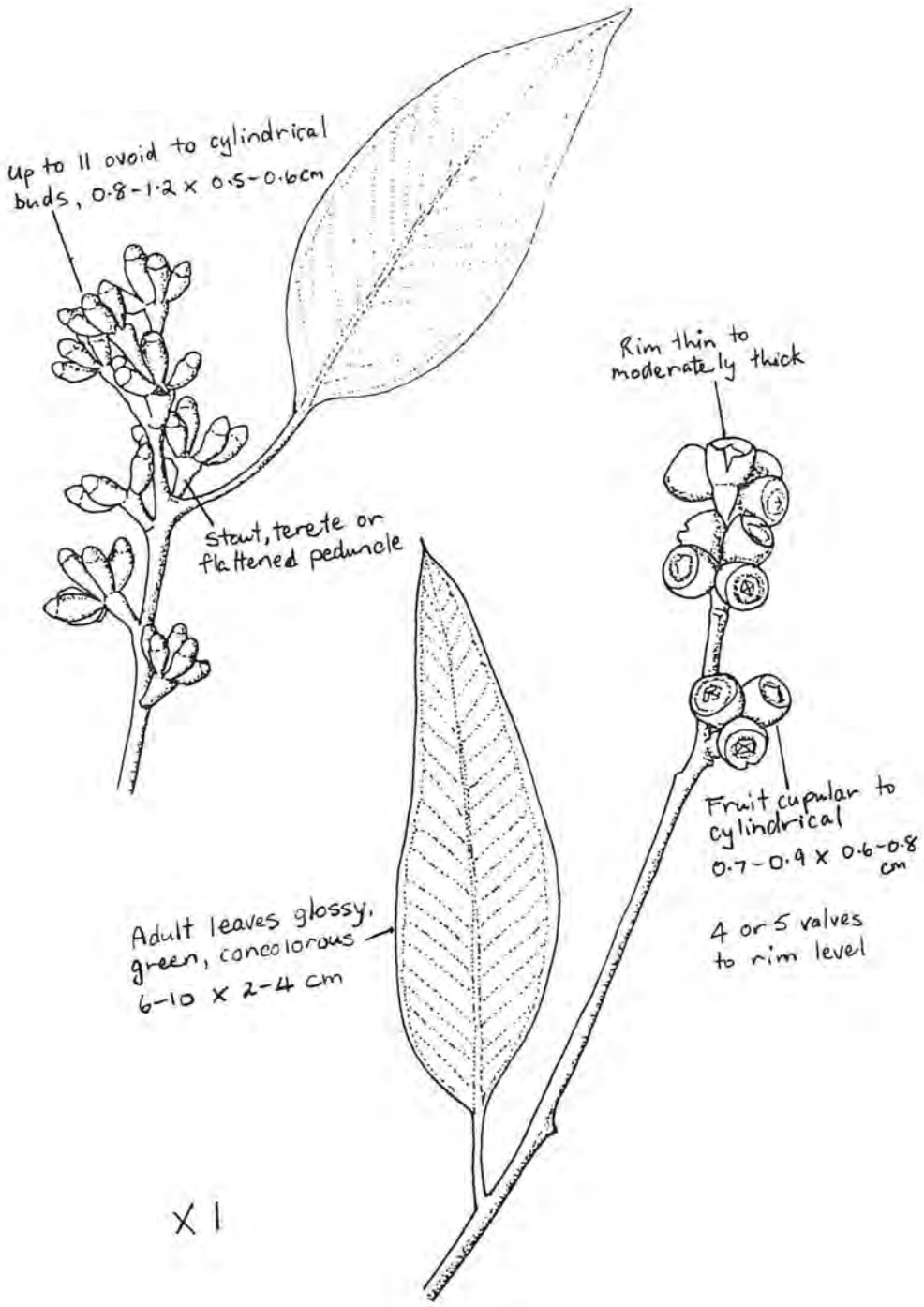
Flowering Period: March to April.

Additional Field Characteristics: A mallee up to 3 m in height with smooth, grey and pale coppery bark. The juvenile leaves are elliptical to orbicular, up to 7 x 6 cm and glossy green. Adult leaves are ovate to broad-lanceolate, 6-10 x 2-4 cm, thick and glossy green with dense reticulation. The inflorescence is 7 (occasionally 11) -flowered and the flowers are white. Stamens are inflexed with versatile anthers. Fruits have a thin to moderately thick rim with an obliquely descending disc. The seed is red-brown, flattish and somewhat wrinkled.

E. argutifolia is related to *E. conglobata* but differs in its bark always being smooth, its longer, pedicellate buds (*conglobata* 0.4-0.8 m x 0.4-0.6 cm), and hemispherical operculum (*conglobata* conical).

References: Brooker and Kleinig (ms).




Up to 11 ovoid to cylindrical buds, 0.8-1.2 x 0.5-0.6cm
Stout, terete or flattened peduncle
Rim thin to moderately thick
Fruit cupular to cylindrical
0.7-0.9 x 0.6-0.8 cm
4 or 5 valves to rim level
Adult leaves glossy, green, concolorous
6-10 x 2-4 cm
X 1

EUCALYPTUS 'ASPERSA' Brooker and Hopper ined.

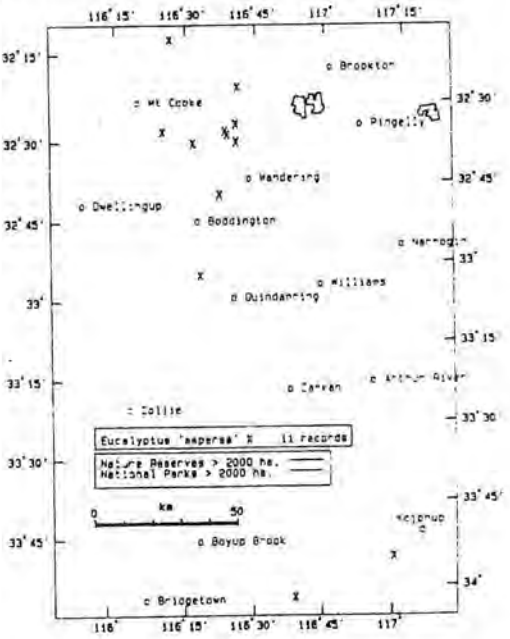
Distribution and Habitat: Has a scattered occurrence, usually in small pure stands, in the northern jarrah forest, from south-west of Kojonup to Mt Saddleback and the Brookton Highway. Usually occurs in gravelly loam.

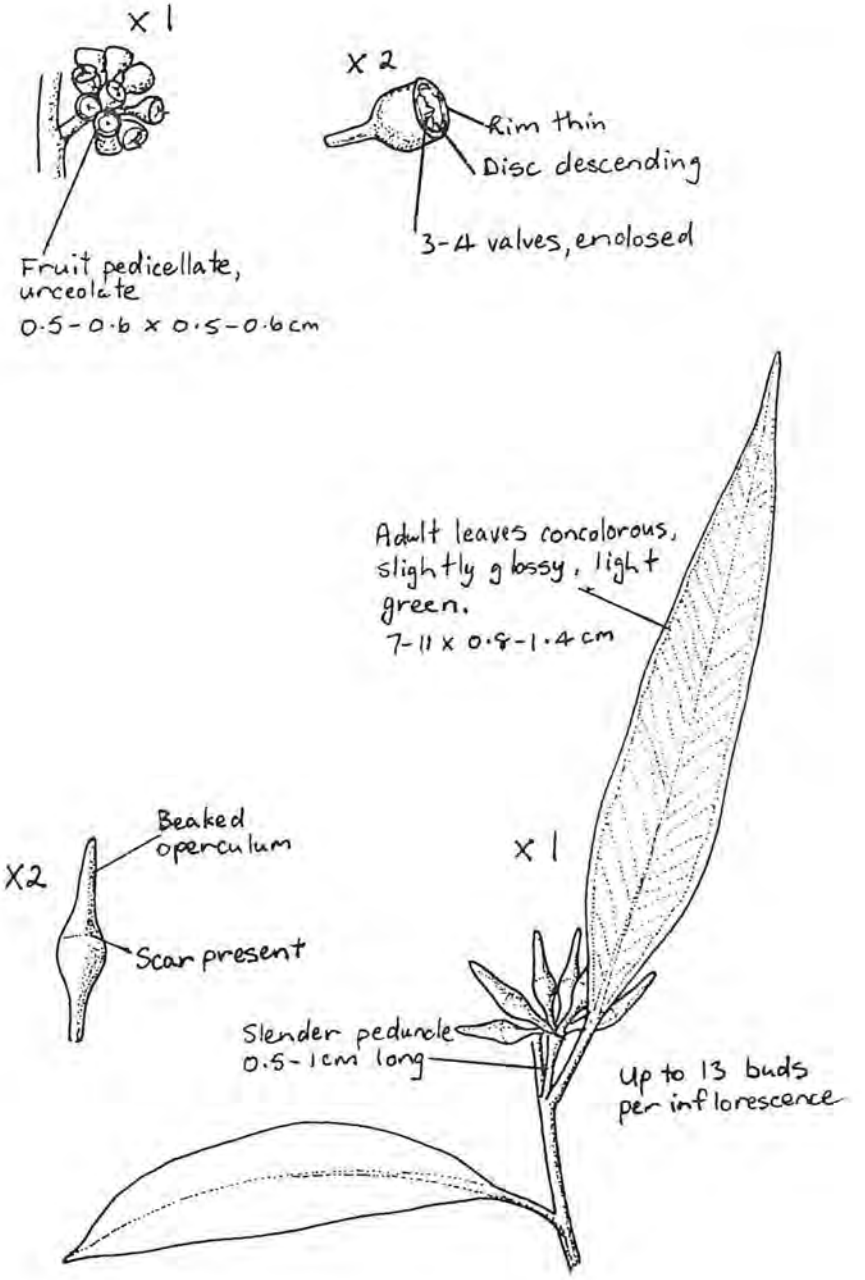
Flowering Period: Unknown.

Additional Field Characteristics: A mallee with rough, loosely held bark on the lower part of stems. The juvenile leaves are sessile, elliptical to ovate, and opposite for many pairs. Adult leaves are narrow lanceolate to lanceolate, 7-11 x 0.8-1.4 cm and light green and slightly glossy. The reticulation is dense with numerous oil glands. Inflorescences have up to 13 flowers; buds with inflexed stamens and basifixed, scarcely versatile anthers. The fruits are urceolate with 3 or 4 enclosed valves which may appear exserted due to persistent style remnants. Seed is grey, shiny and smooth.

E. 'aspersa' is related to *E. oleosa* which occurs in dry, sandy areas from the Goldfields east and which has linear early juvenile leaves. *E. oleosa* also has narrower, green and very glossy adult leaves (5-10 x 0.5-1 cm) and smaller, ovoid to broadly fusiform buds (0.5-0.8 x 0.2-0.3 cm) with a rounded or rarely conical operculum.

References: Brooker and Kleinig (ms).




X 1
X 2
Rim thin
Disc descending
3-4 valves, enclosed
Fruit pedicellate, urceolate
0·5-0·6 x 0·5-0·6 cm
Adult leaves concolorous, slightly glossy, light green.
7-11 x 0·8-1·4 cm
X2
Beaked operculum
Scar present
X 1
Slender peduncle 0.5-1cm long
Up to 13 buds per inflorescence

EUCALYPTUS BREVISTYLIS Brooker

Rate's Tingle

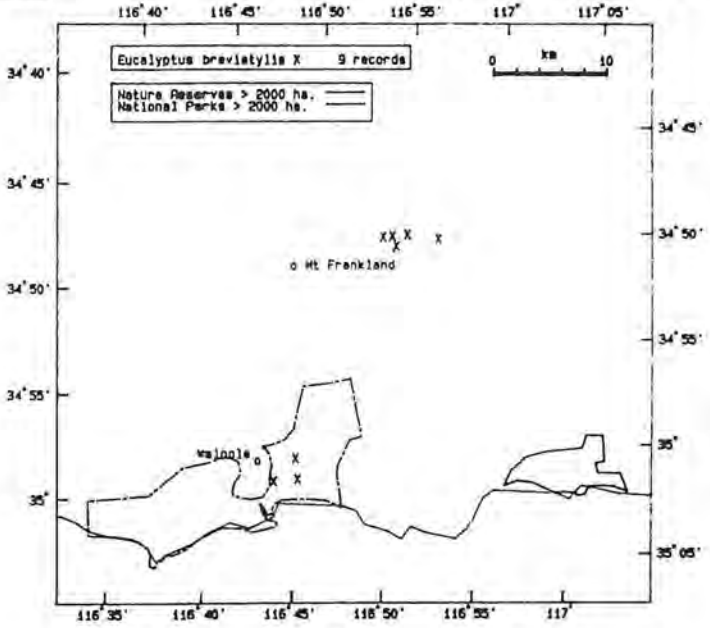
Distribution and Habitat: Has a restricted distribution east and north-east of Walpole where it occurs in deep soils, usually along waterways. It is associated with *E. calophylla, E. marginata, E. diversicolor* and *E. megacarpa*.

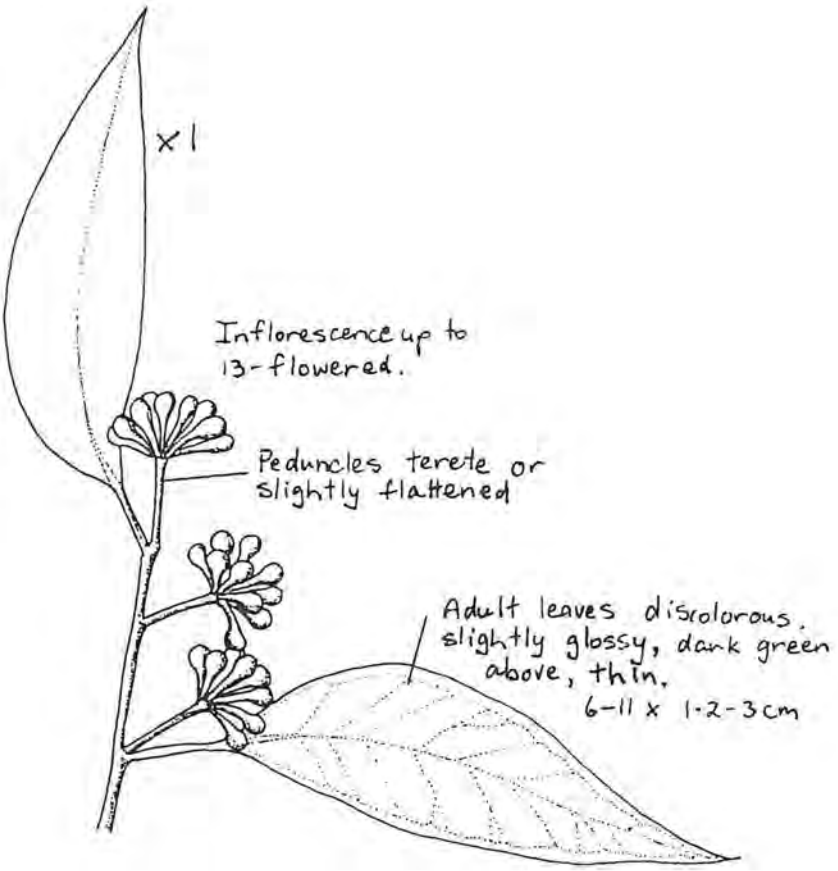
Flowering Period: April-November.

Additional Field Characteristics: A medium to tall tree up to 40 m high with rough, fibrous, light grey-brown over reddish-brown bark throughout. Seedling stems and adult branchlets are usually glaucous. Juvenile leaves are petiolate, cordate, to 9 x 6 cm, glossy and light green and the juvenile stems are red and glaucous. Adult leaves are discolorous and slightly glossy with numerous oil glands. The inflorescence is 7 to 13-flowered (usually 11). The flowers are white with inflexed stamens in the bud. The outer stamens are without anthers and the style is short. Seeds are brown and pyramidal with the dorsal side rounded and the ventral side ribbed.

This species can be confused with *E. marginata* when not in bud or flower. It differs in its more rounded budcaps and smaller fruits with a very thin rim (*marginata* fruits 1.9-1.6 x 0.9-1.5 cm). The petiolate, cordate juvenile leaves also distinguish *brevistylis*.

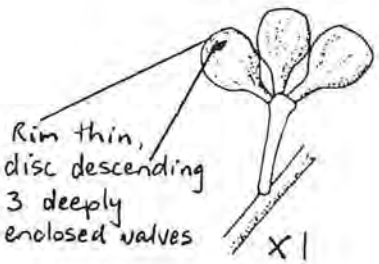
References: Elliot and Jones (1986), Brooker and Kleinig (ms).





Buds clavate to ovoid, shorter than pedicels
0·3 × 0·3 cm

Fruit truncate-globose, wrinkled when dry
0·6–1 × 0·6–1 cm



EUCALYPTUS CALCICOLA Brooker

Boranup Mallee

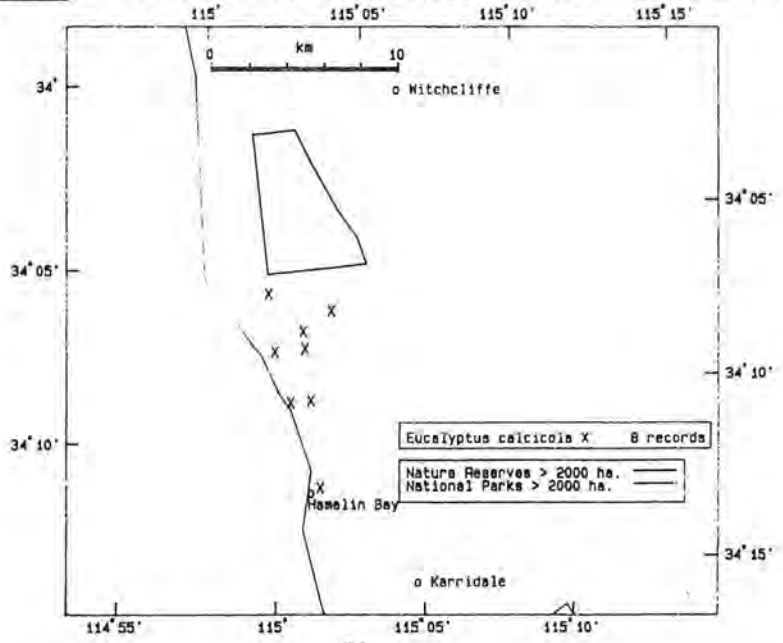
Distribution and Habitat: Has a very restricted distribution between Cape Freycinet and Cape Hamelin occurring on coastal limestone dunes. A variant (possibly a new subspecies) occurs further east of West Cape Howe and near Bremer Bay.

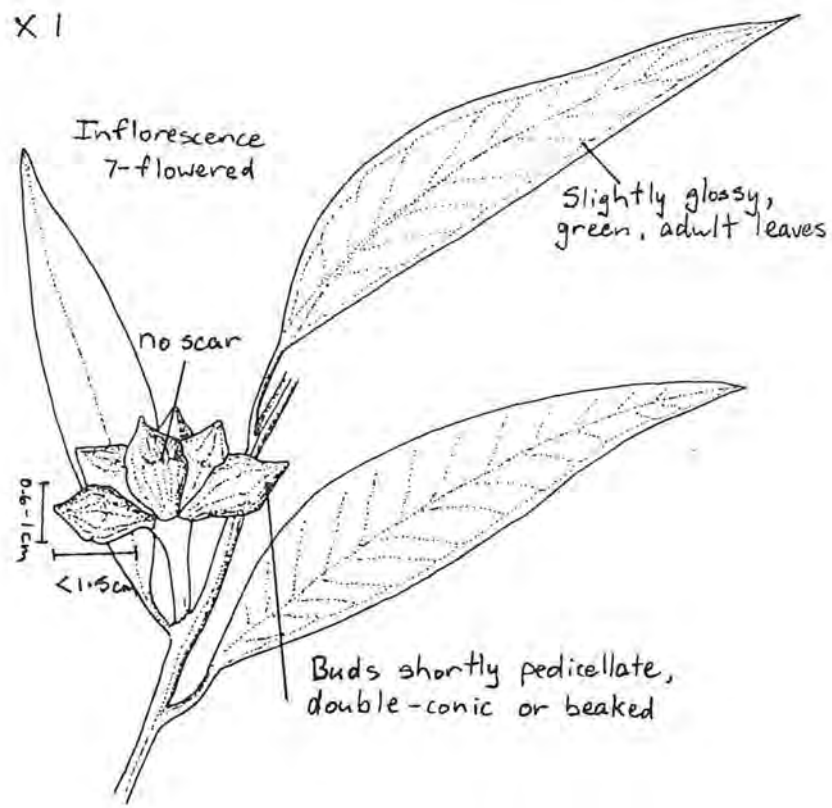
Flowering Period: May-June.

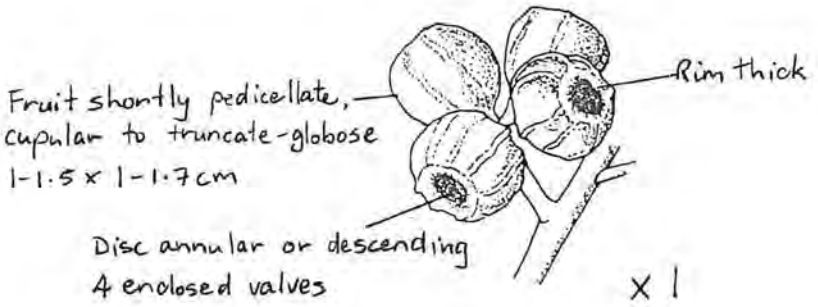
Additional Field Characteristics: A mallee up to 5 m with smooth, light grey, pinkish grey, yellowish or green bark. The juvenile leaves are sessile and opposite for many pairs with long internodes and ovate, to 15 x 9 cm. They are glossy and bright green, becoming petiolate. Adult leaves are slightly glossy with numerous, irregular-oil glands. Inflorescences are axillary and the flowers white with variously flexed stamens. The ribbed fruits have a thick rim, including the annular or descending disc and 4 enclosed valves. The seed is black and lustrous and pyramidal in shape.

E. calcicola has similarities with *E. ligulata* but differs in its juvenile leaves (*ligulata* dull, blue-green), bud shape and size (*ligulata* clavate to broadly fusiform, less ribbed, 0.3-0.6 cm wide) and the number of fruit valves (*ligulata* 3).

References: Elliot & Jones (1986), Brooker and Kleinig (ms).




X 1
Inflorescence
7-flowered
Slightly glossy,
green, adult leaves
no scar
0.6-1cm
<1.5cm
Buds shortly pedicellate,
double-conic or beaked


Fruit shortly pedicellate,
cupular to truncate-globose
1-1.5 x 1-1.7cm
Rim thick
Disc annular or descending
4 enclosed valves
X 1

EUCALYPTUS EXILIS Brooker

Boyagin Mallee

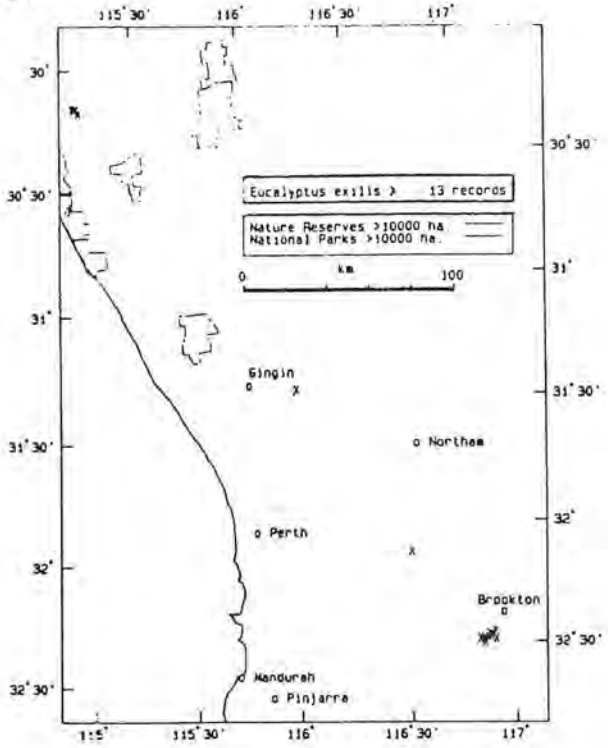
Distribution and Habitat: Occurs in a few scattered localities between Mt. Lesueur and Boyagin Rock where it grows in laterite or sand over laterite with other eucalypts and dense heath.

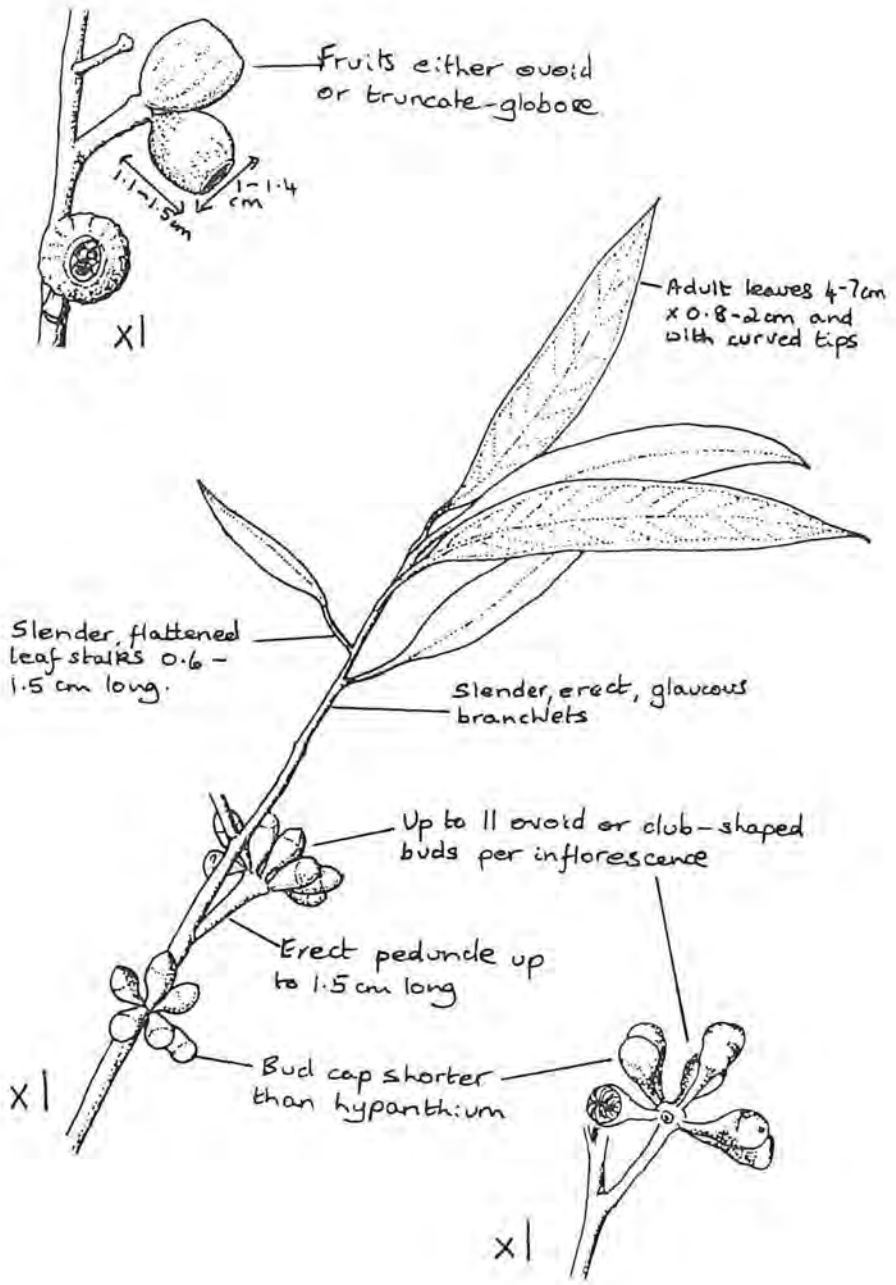
Flowering Period: September-October.

Additional Field Characteristics: A slender, erect-stemmed mallee to 6 m with a thin canopy, glaucous branchlets and smooth pale bark. The juvenile leaves are sessile, opposite and elliptic in shape, 1.5-10 x 1-6 cm. The operculum is generally hemispherical, but may be broadly conical or with a short pointed tip. The seed is black and slightly striated, pyramidal in shape.

Eucalyptus exilis is related to *E. pendens* and *E. sepulcralis* but both the latter two species have weeping stems and branchlets. They also have larger leaves, buds and fruits.

References: Brooker (1974); Rye and Hopper (1981); Elliott and Jones (1986).




Fruits either ovoid or truncate-globose
1.1-1.5 cm
1-1.4 cm
x1
Adult leaves 4-7cm x 0.8-2cm and with curved tips
Slender, flattened leaf stalks 0.6-1.5 cm long.
Slender, erect, glaucous branchlets
Up to 11 ovoid or club-shaped buds per inflorescence
Erect peduncle up to 1.5 cm long
Bud cap shorter than hypanthium
x1
x1

EUCALYPTUS FICIFOLIA F. Muell.

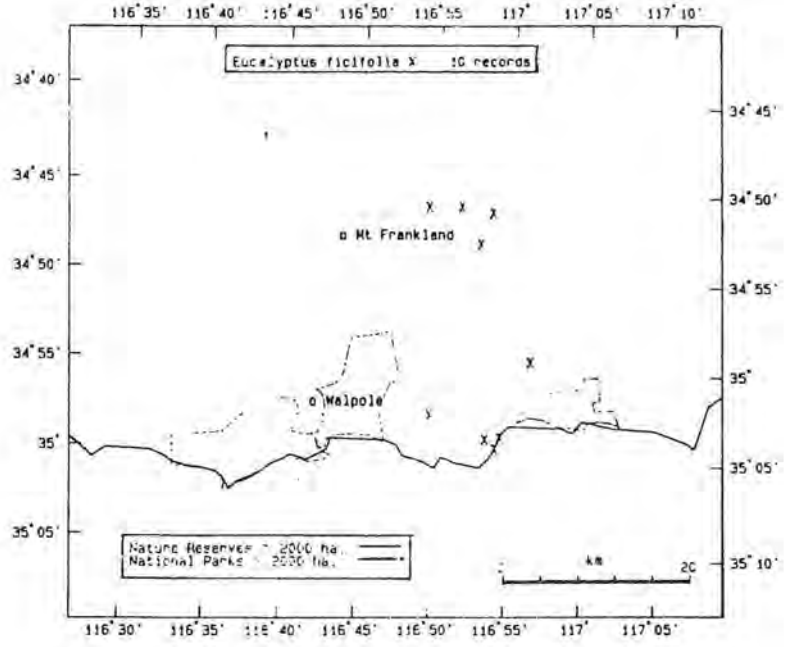
Red-flowering bloodwood

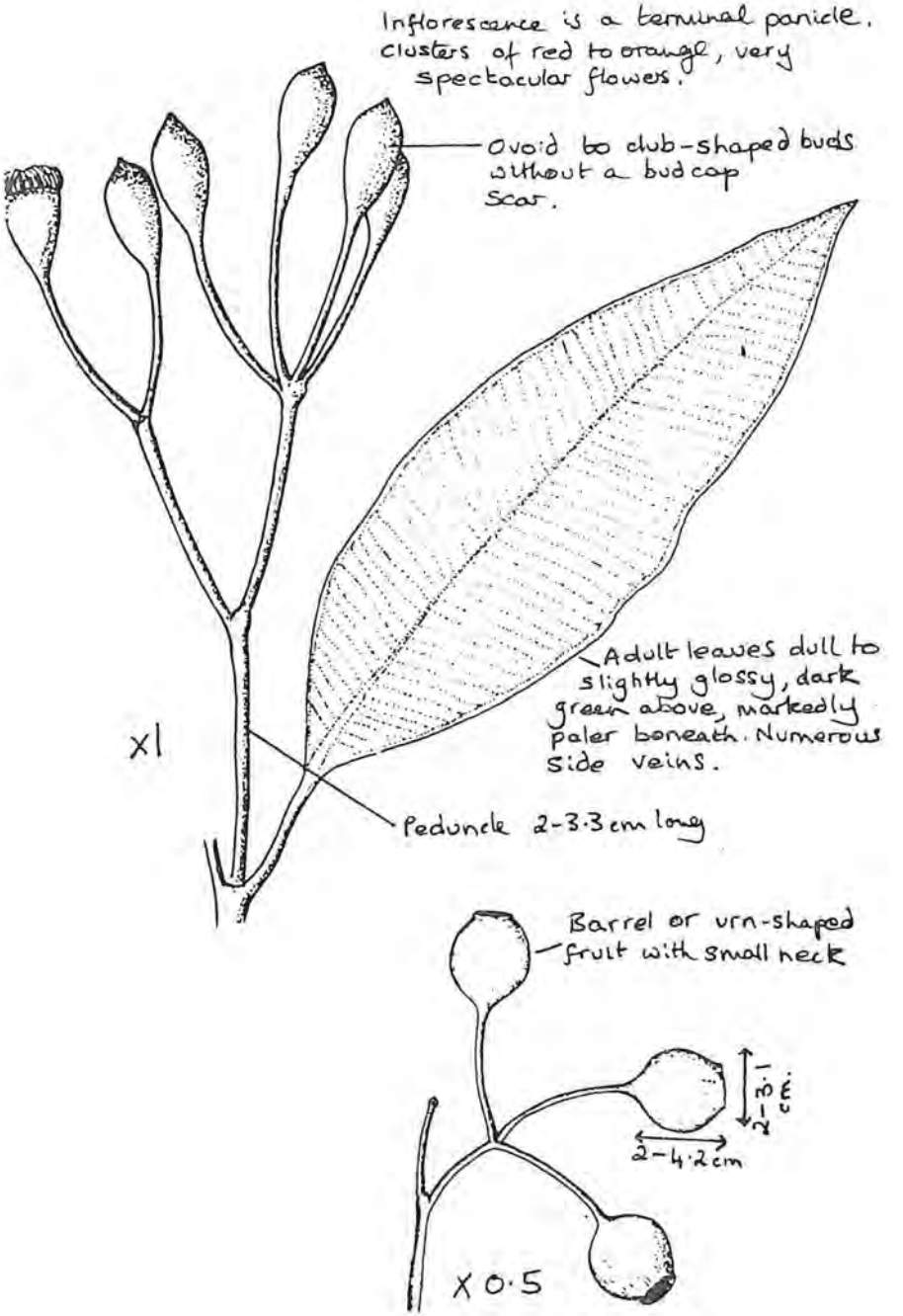
Distribution and Habitat: Occurs over a restricted geographical range of c. 30 km east of Walpole, mainly along the coast with a few scattered occurrences further inland. Grows on sandhills and depressions amongst lateritic hills, on white or grey sand. It is usually a component of low open woodland or forest, often with *E. marginata, Casuarina fraseriana, Banksia attenuata* and *B. ilicifolia*.

Flowering Period: January - April.

Additional Field Characteristics: A small straggling tree up to 9 m in height with rough, longitudinally furrowed bark, light grey to reddish brown in colour. Juvenile leaves are ovate to broad-lanceolate, 12 x 6 m. Adult leaves are 7-14 x 2-6 cm, apparently without glands. The peduncles are flattened or angular, 2-3.3 cm long. The buds measure 1.2 - 1.6 x 0.6 - 0.8 cm. Inside the bud, the stamens are all inflexed. The species is similar to *E. calophylla* ("marri") but differs in its orange to red flowers, longitudinally furrowed bark, and its seed which is reddish brown and winged at the top (*E. calophylla* seed is large, boat shaped, black, not winged).

References: Blakely (1955)




Inflorescence is a terminal panicle. clusters of red to orange, very spectacular flowers.
Ovoid to club-shaped buds without a bud cap scar.
Adult leaves dull to slightly glossy, dark green above, markedly paler beneath. Numerous side veins.
X1
Peduncle 2-3.3 cm long
Barrel or urn-shaped fruit with small neck
2-3.1 cm
2-4.2 cm
X 0.5

EUCALYPTUS FOECUNDA Schauer

Coastal dune mallee, Fremantle mallee

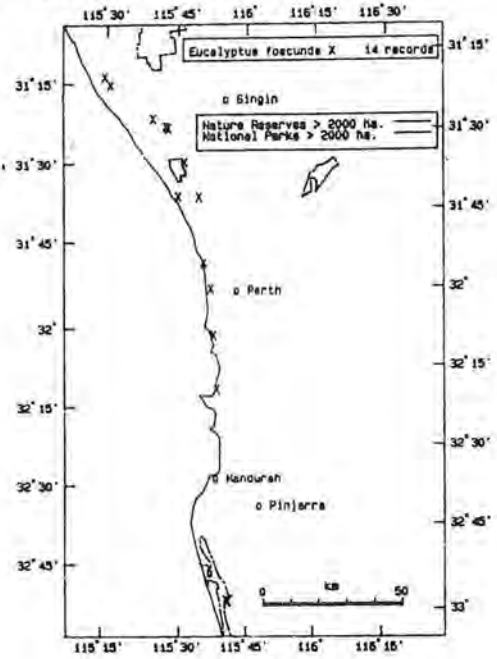
Distribution and Habitat: Restricted to coastal areas from south of Mandurah, north to Lancelin, found particularly in sandy areas often over shallow limestone.

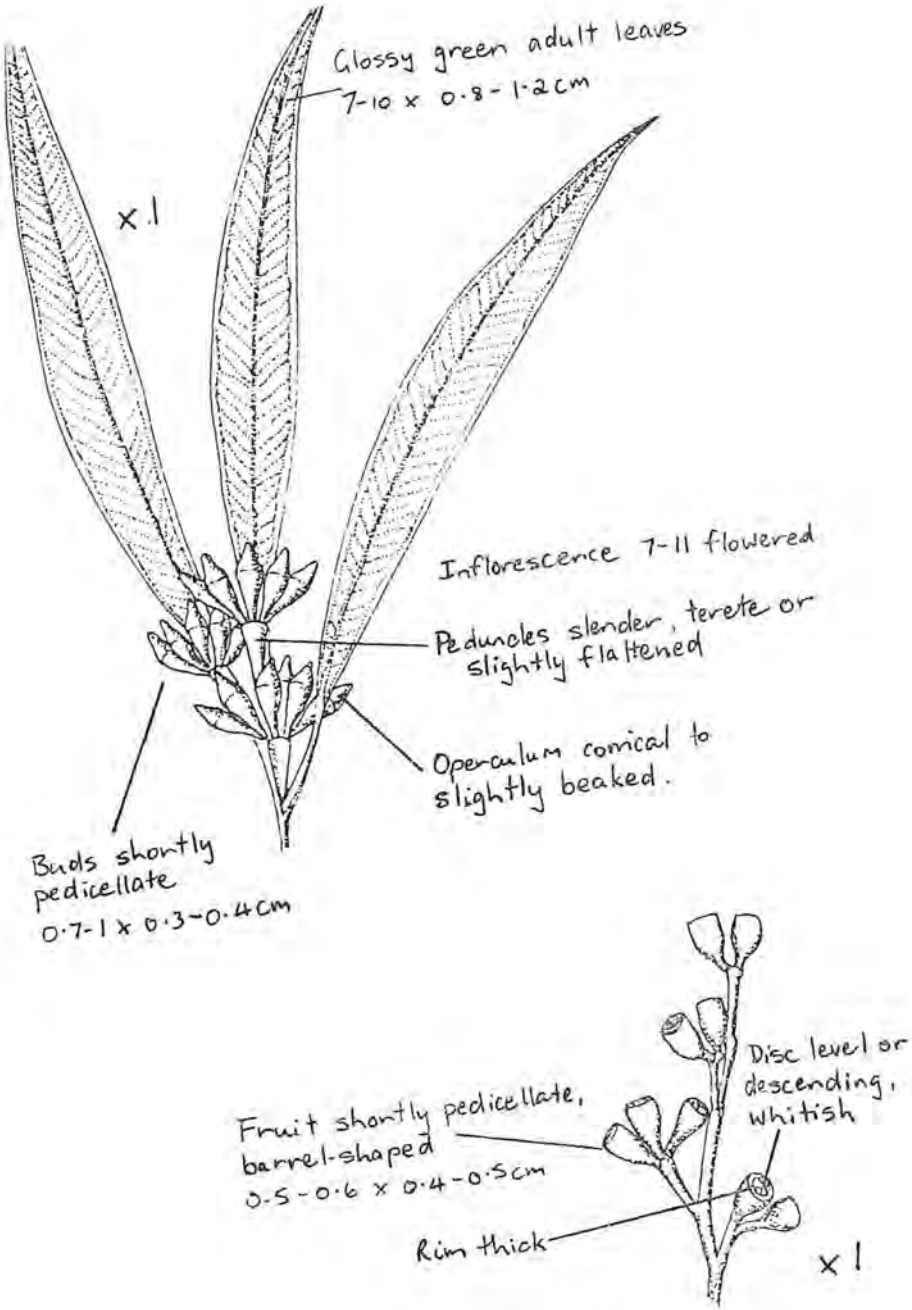
Flowering Period: January to May.

Additional Field Characteristics: A mallee to 4 m with rough, thin, grey bark. Newly exposed layers are whitish. Juvenile leaves are sessile, lanceolate, opposite for many pairs and dull blue-green becoming glossy green with warty stem. Adult leaves are concolorous and glossy green with very dense reticulation. The inflorescences are axillary, often clustered towards ends of branchlets and the flowers are creamy-white. The seed is grey to pale reddish-brown and compressed ovoid in shape.

E. foecunda is related to *E. rigidula* and *E. leptophylla* (the latter having previously been included in *E. foecunda*). Both *E. rigidula* and *E. leptophylla* differ in having smooth bark. *E. rigidula* is also distinguished by its slightly larger fruits (0.5-0.8 x 0.5-0.8 cm) and its disc, which is not whitish. *E. leptophylla* has smaller buds (0.5-0.4 x 0.2-0.3 cm) and fruit (0.4-0.5 x 0.3-0.4 cm), and elliptic to ovate, glaucous juvenile leaves.

References: Brooker and Kleinig (ms).




Glossy green adult leaves
7-10 x 0·8-1·2cm
x 1
Inflorescence 7-11 flowered
Peduncles slender, terete or slightly flattened
Operculum conical to slightly beaked.
Buds shortly pedicellate
0·7-1 x 0·3-0·4cm
Disc level or descending, whitish
Fruit shortly pedicellate, barrel-shaped
0·5-0·6 x 0·4-0·5cm
Rim thick
x 1

EUCALYPTUS GUILFOYLEI Maiden

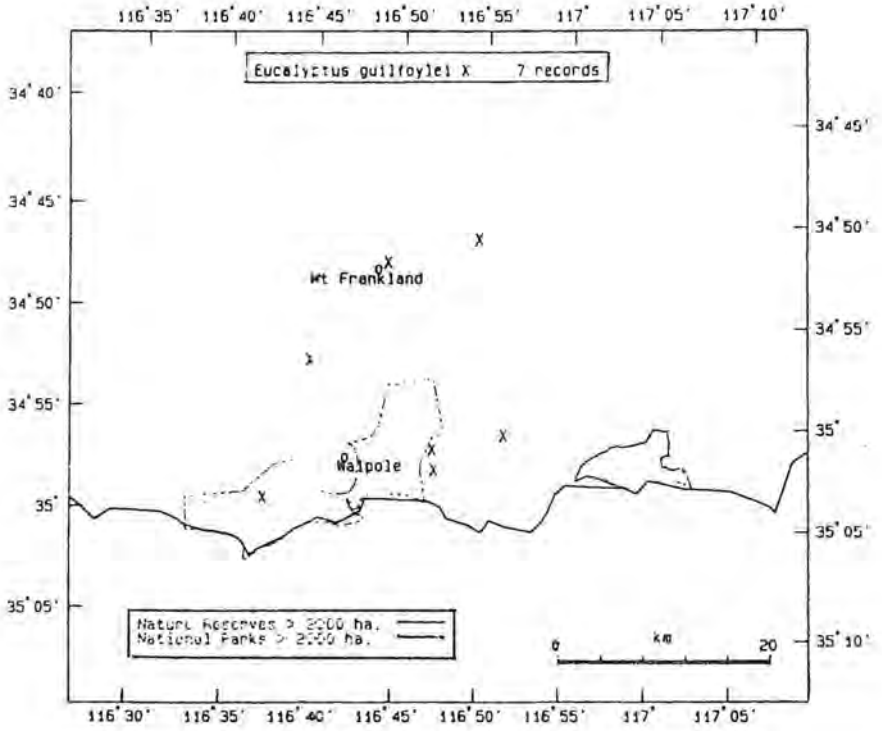
Yellow Tingle

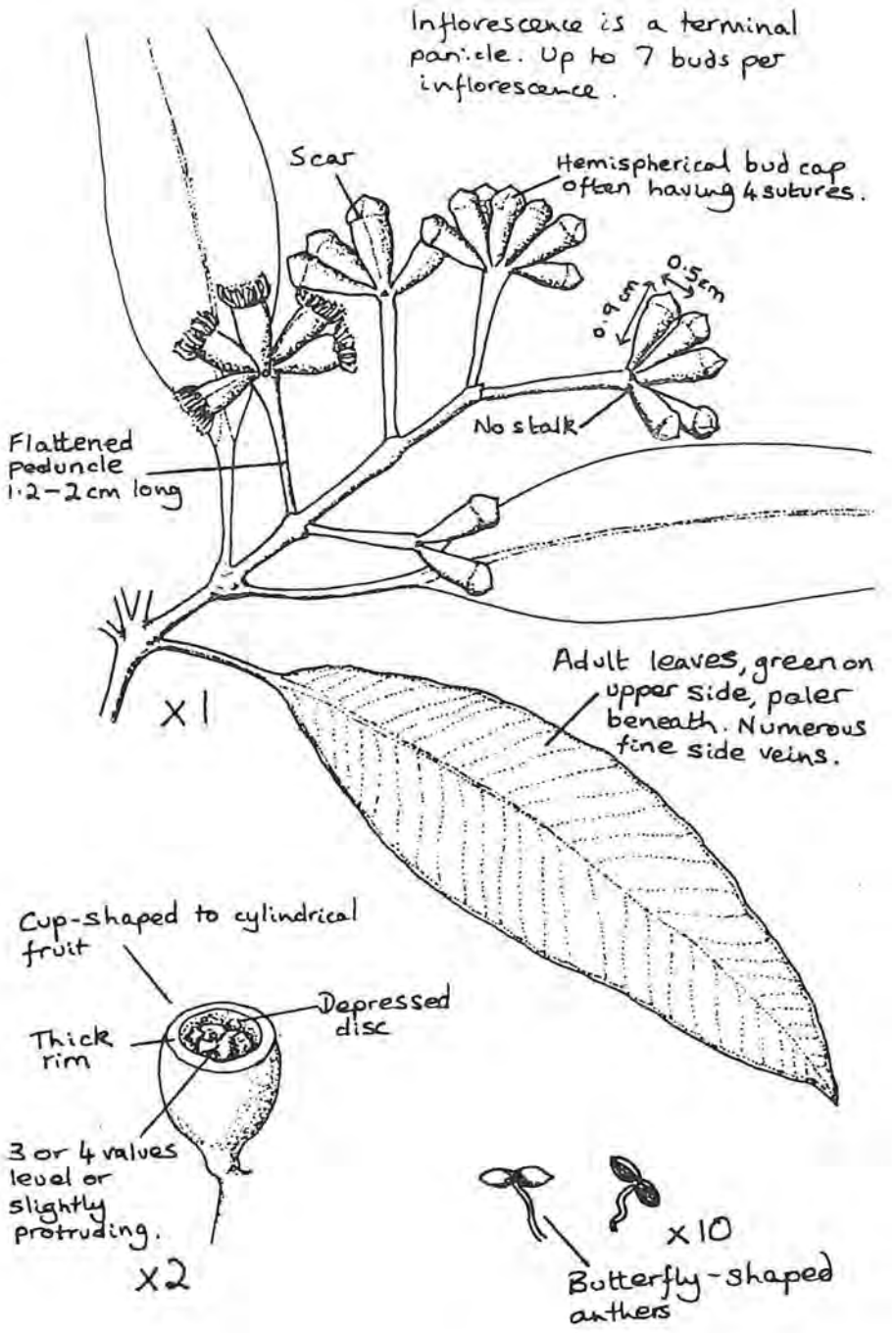
Distribution and Habitat: Has a very restricted distribution in the Walpole to Bow Bridge area and for 20 km to the north. It occurs on the edges of karri forest, in brown loams and clay soils. Associated species include *E. diversicolor*, *E. megacarpa*, *E. calophylla* and *E. marginata*.

Flowering Period: November to December.

Additional Field Characteristics: A medium to tall tree, up to 40-60 m in height. The bark is grey brown in colour, rough, short fibred and crumbly. Juvenile leaves are elliptic to ovate, green on the upper side, paler beneath, 5-13 x 3-7 cm. Adult leaves are 0-16 x 1.6-4 cm and apparently with no oil glands. Both stamens and style may be bent or twisted. The sessile fruits measure 0.7-1 x 0.8-1 cm. The seed is red-brown and roundish.

References: Maiden (1911); Gardner (1979).




Inflorescence is a terminal panicle. Up to 7 buds per inflorescence.
Scar
Hemispherical bud cap often having 4 sutures.
0.5cm
0.9cm
No stalk
Flattened peduncle 1·2–2cm long
×1
Adult leaves, green on upper side, paler beneath. Numerous fine side veins.
Cup-shaped to cylindrical fruit
Depressed disc
Thick rim
3 or 4 valves level or slightly protruding.
×2
×10
Butterfly-shaped anthers

EUCALYPTUS JACKSONII Maiden

Red Tingle

Distribution and Habitat: Has a very restricted distribution over a range of about 20 km in the Walpole area. Occurs with *E. diversicolor*.

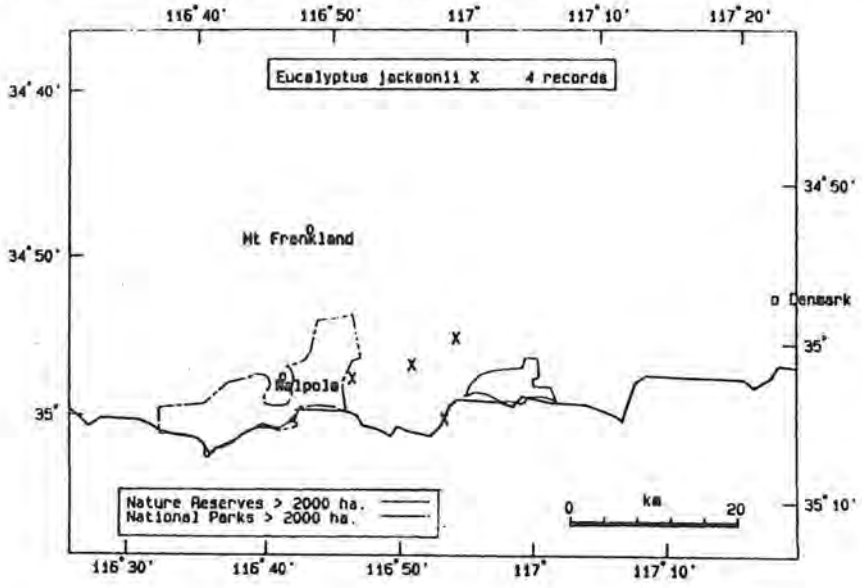
Flowering Period: January - March.

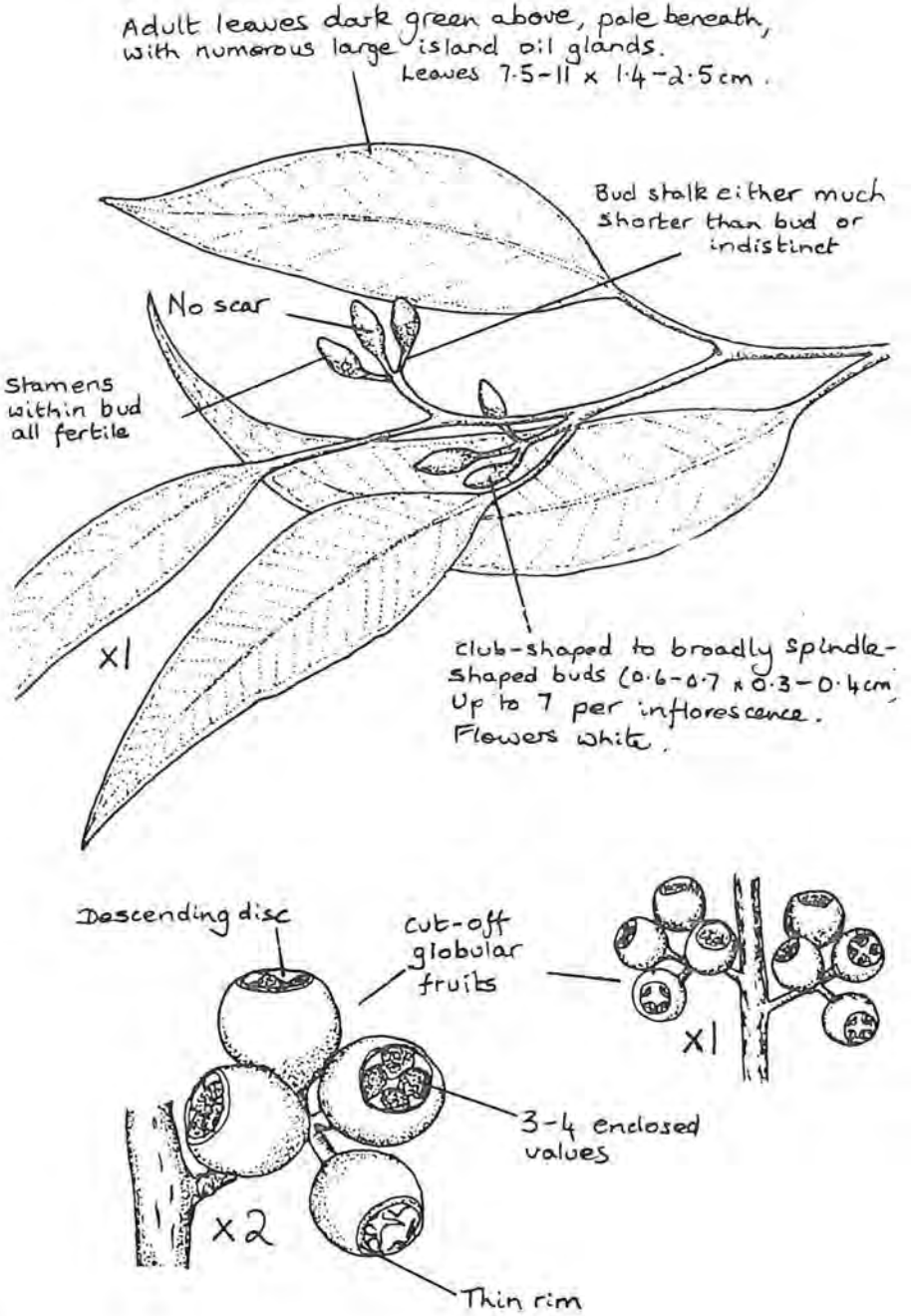
Additional Field Characteristics: A tall tree up to 65 m, with a rough stringy bark and the butt prominently buttressed. The bark is shallowly furrowed, grey over red-brown in colour. Juvenile leaves are opposite and elliptic for a few pairs, then alternating, petiolate and ovate, 6-17 x 4-10 cm, green in colour, slightly glossy, paler beneath.

Within the buds, the stamens are all fertile and are variously flexed. Fruits are 0.6-0.8 - 0.8-1 cm. The seeds are shiny brown and pyramidal in shape.

The species is similar to *E. brevistylis*, differing in its larger buds (*brevistylis* buds to 0.3 x 0.3 cm), its juvenile leaves (*brevistylis* - cordate with glaucous red stems) and its generally fewer flowers per inflorescence (*brevistylis* - 7 or more). The flowering period of *E. brevistylis* is from April-November, also its outer stamens are without anthers.

References: Blackall and Grieve (1980); Gardner (1979); Maiden (1913); Brooker and Kleinig (ms).




Adult leaves dark green above, pale beneath, with numerous large island oil glands.
Leaves 7·5–11 × 1·4–2·5 cm.
Bud stalk either much shorter than bud or indistinct
No scar
Stamens within bud all fertile
x1
Club-shaped to broadly spindle-shaped buds (0·6–0·7 × 0·3–0·4 cm)
Up to 7 per inflorescence.
Flowers white.
Descending disc
Cut-off globular fruits
x1
3–4 enclosed values
x2
Thin rim

EUCALYPTUS LANE-POOLEI Maiden

Salmonbark Wandoo

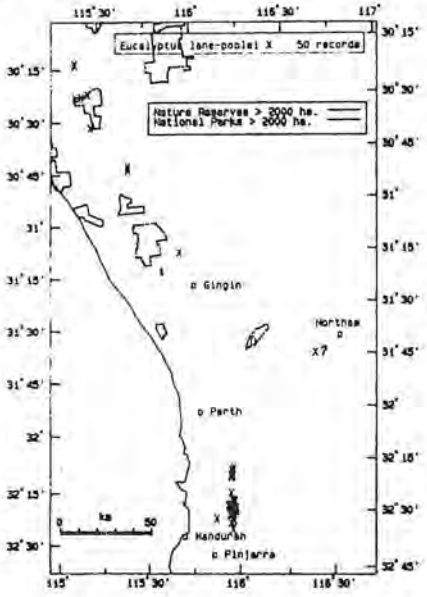
Distribution and Habitat: Found in a disjunct distribution on the western scarp of the Darling Range and adjacent plains between Waroona and Clackline with populations also between Jurien Bay and Gingin. There is also a possible new location near Denmark. Usually found on sand over laterite or deep sand near the coast.

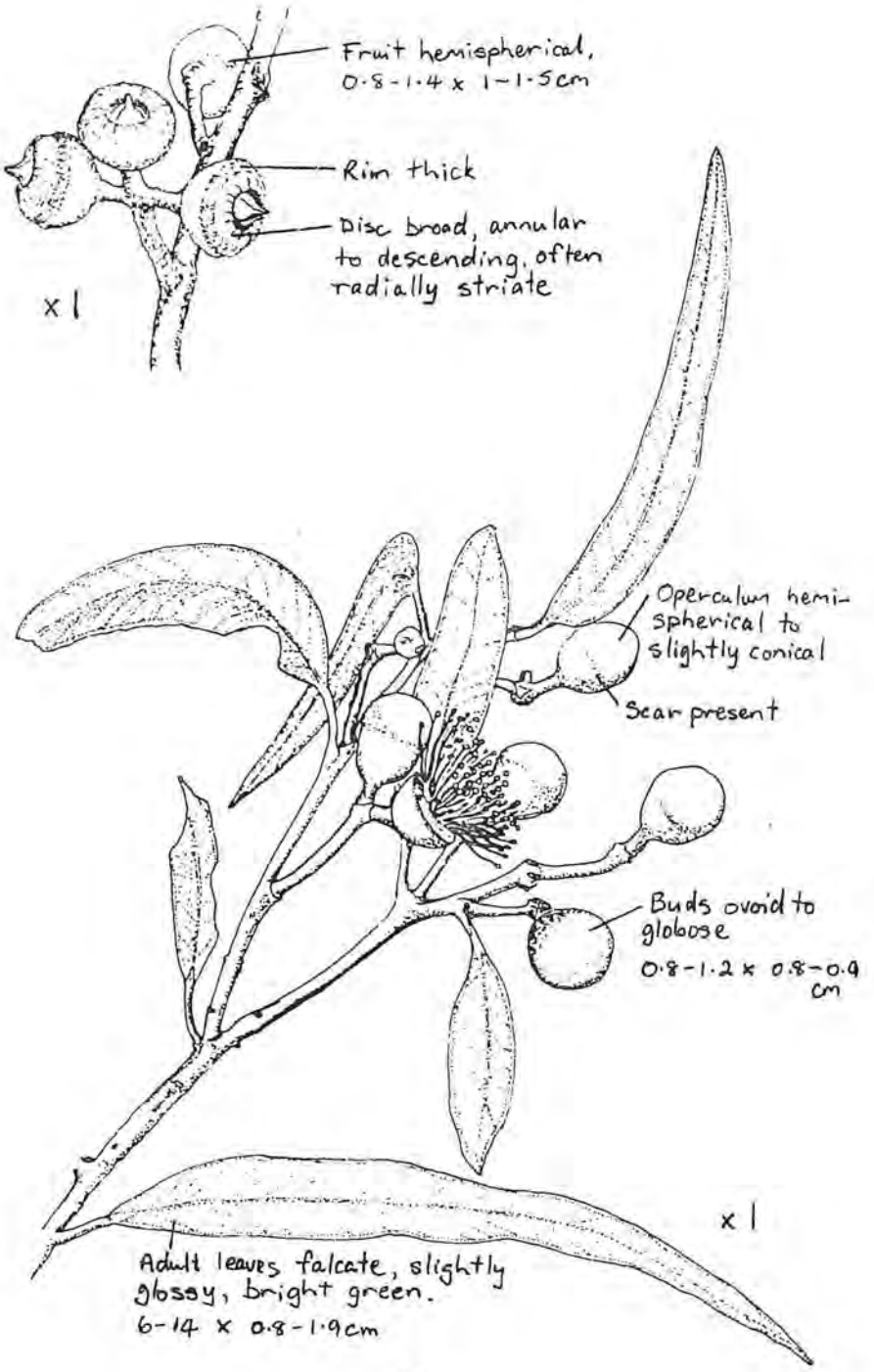
Flowering Period: January to April with possible flowering all year.

Additional Field Characteristics: A small to medium sized tree to 12 m with moderately dense foliage. Bark mostly smooth, orange or orange-brown, weathering to grey or whitish with some loosely held brown flakes. Juvenile leaves ovate, dull and light green, measuring 9 x 3.5 cm. Adult leaves falcate, 6-14 x 0.8-1.9 cm, slightly glossy and bright green. Their reticulation is very dense with scattered to numerous oil glands. Flowers are white to cream and profuse. Seed is grey and compressed-ovoid in shape.

This species has similarities with *E. drummondii* but *E. drummondii* can be distinguished by its smaller, straggly habit, powdery white or grey bark, conical bud cap and glaucous buds and peduncles.

References: Brooker and Kleinig (ms), Elliot and Jones (1986), Chippendale (1973).




Fruit hemispherical, 0·8-1·4 x 1-1·5cm
Rim thick
Disc broad, annular to descending, often radially striate
x 1
Operculum hemispherical to slightly conical
Scar present
Buds ovoid to globose
0·8-1·2 x 0·8-0·9 cm
x 1
Adult leaves falcate, slightly glossy, bright green.
6-14 x 0·8-1·9cm

EUCALYPTUS AFF. LANE-POOLEI

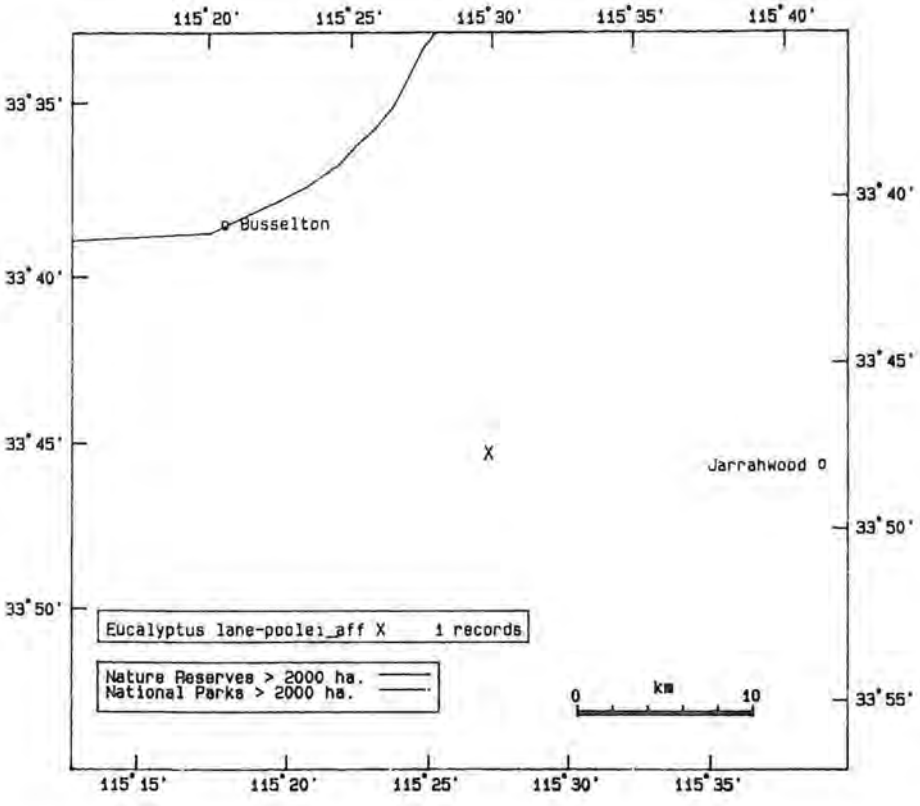
Distribution and Habitat: There is only one known location of this plant. It was collected south-east of Yoongarillup, south of Busselton in 1987 in loam with massive laterite on a creekline. Associated species were *E. marginata* and *E. calophylla* over open scrub.

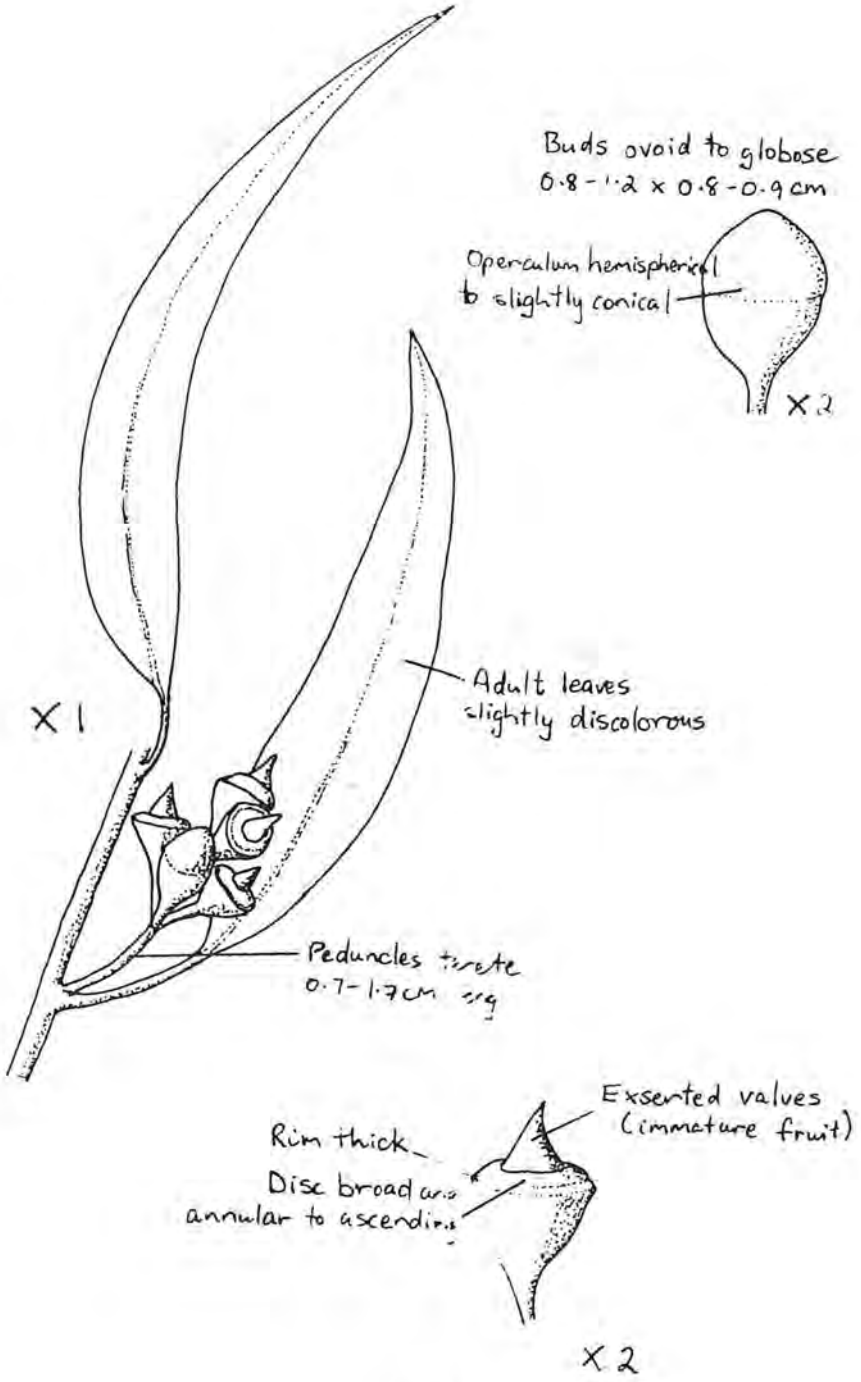
Flowering Period: Unknown.

Additional Field Characteristics: A straggly small tree or mallee, thick-trunked to 3 m tall with rough grey-brown, friable bark. The canopy is yellowish-green and the adult leaves slightly discolorous.

E. aff. *lane-poolei* differs from *E. lane-poolei* in having rough bark (*lane-poolei* mostly smooth, orange-brown weathering to grey or whitish) and its slightly-discolorous leaves.

References: S. Hopper (pers. comm.), Brooker and Kleinig (ms).




Buds ovoid to globose
0.8 - 1.2 x 0.8 - 0.9 cm
Operculum hemispherical to slightly conical
X 2
X 1
Adult leaves slightly discolorous
Peduncles terete
0.7 - 1.7 cm long
Exserted valves (immature fruit)
Rim thick
Disc broad and annular to ascending
X 2

EUCALYPTUS 'LATENS' Brooker

Narrow-leaved Red Mallee

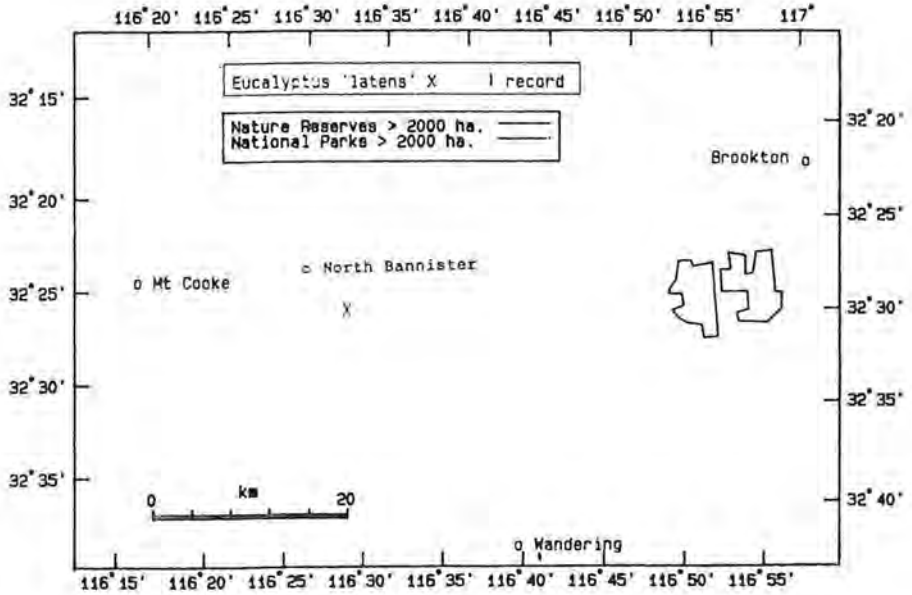
Distribution and Habitat: Known only from one pure stand in the northern jarrah forest in the North Bannister area. Similar stands to the south-east may belong to this species but research is required.

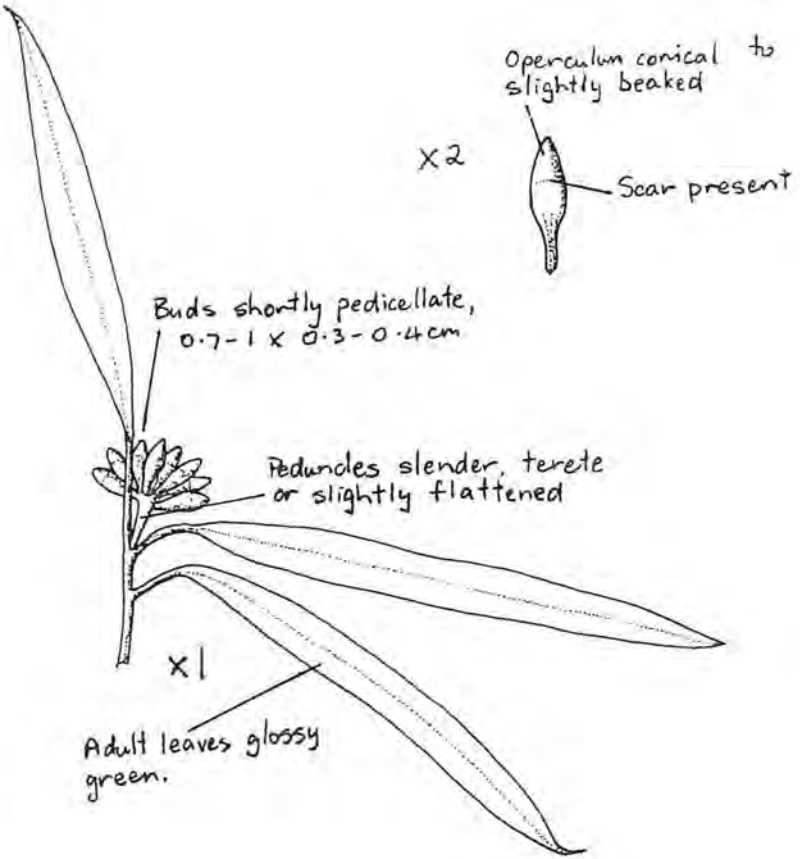
Flowering Period: Unknown.

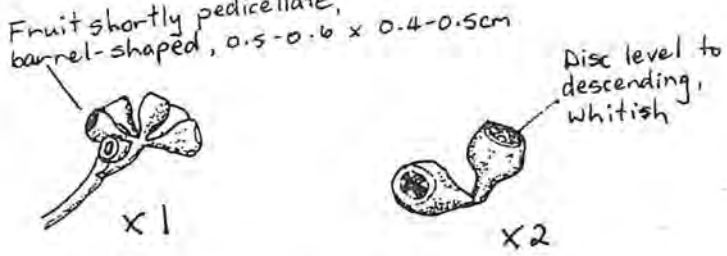
Additional Field Characteristics: A mallee to 4 metres with smooth, grey brown and light coppery stems. Juvenile leaves are narrower and elongated, sessile, opposite for many pairs and glaucous. They are prominent as stem coppice in the principal stand. Adult leaves are concolorous and glossy green.

This is a rcently discovered species related to *E. foecunda* and *E. leptophylla*. It differs from *E. foecunda* in its smooth stem, narrower, glaucous juvenile leaves (*foecunda* 6 x 1.5 cm) and its jarrah forest habitat. *E. leptophylla* has elliptical to ovate juvenile leaves (2.5 x 1.6 cm) with warty stems and occurs in the eastern wheatbelt.

References: Brooker and Kleinig (ms), Brooker (pers. comm.).




Operculum conical to slightly beaked
x2
Scar present
Buds shortly pedicellate, 0.7-1 x 0.3-0.4cm
Peduncles slender, terete or slightly flattened
x1
Adult leaves glossy green.


Fruit shortly pedicellate, barrel-shaped, 0.5-0.6 x 0.4-0.5cm
x1
Disc level to descending, whitish
x2

EUCALYPTUS 'PETRENSIS' Brooker and Hopper ined.

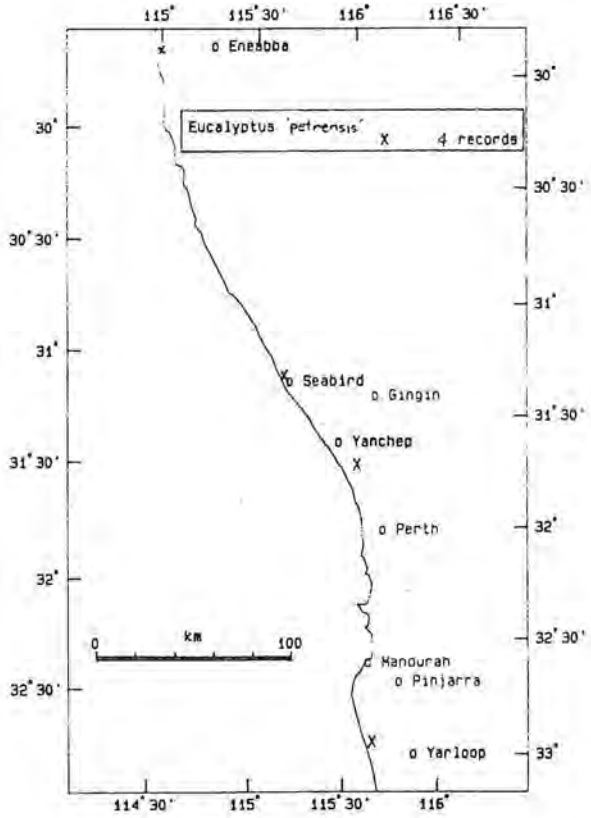
Distribution and Habitat: Has been recorded from Yalgorup to Seabird with an isolated occurrence west of Eneabba. Occurs on limestone ridges.

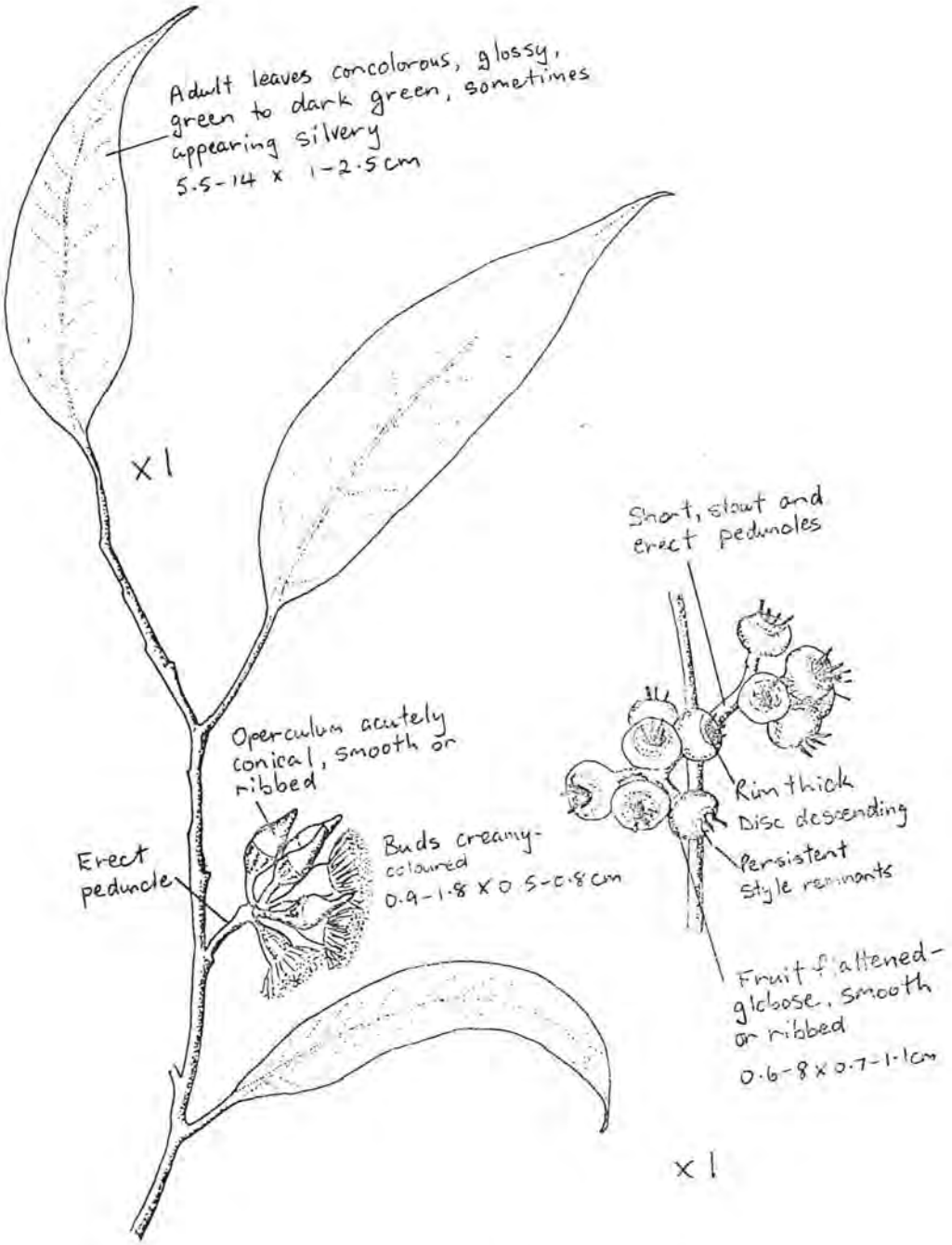
Flowering Period: July - ?

Additional Field Characteristics: A straggly, spreading mallee to 3.5 m with smooth barked stems, often forming dense, pure stands.

Differs from *E. falcata* in its shorter, stouter peduncles (*falcata* 0.7-2 cm long) which are not down-curved, its straggling, spreading habit and its limestone habitat (*falcata* generally on laterite breakaways). It is also similar to *E. decipiens* but *E. decipiens* has rough bark and sessile buds and fruits.

References: S. Hopper (pers. comm.), Brooker and Kleinig (ms).




Adult leaves concolorous, glossy, green to dark green, sometimes appearing silvery
5.5-14 x 1-2.5 cm
x1
Short, stout and erect peduncles
Operculum acutely conical, smooth or ribbed
Erect peduncle
Buds creamy-coloured
0.9-1.8 x 0.5-0.8 cm
Rim thick
Disc descending
Persistent style remnants
Fruit flattened-globose, smooth or ribbed
0.6-8 x 0.7-1.1 cm
x1

EUCALYPTUS 'PHY' AFF. DECIPIENS

Meelup Mallee

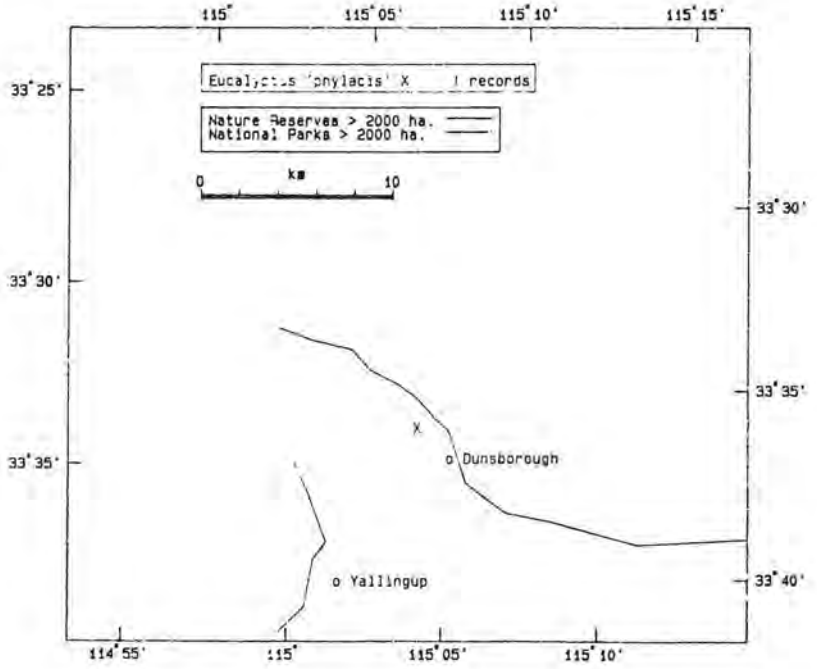
Distribution and Habitat: Known from only one population near Meelup, west of Busselton in loamy granitic soil on a gradual slope facing the coast. Growing in woodland over scrub with *E. marginata* and *E. calophylla*.

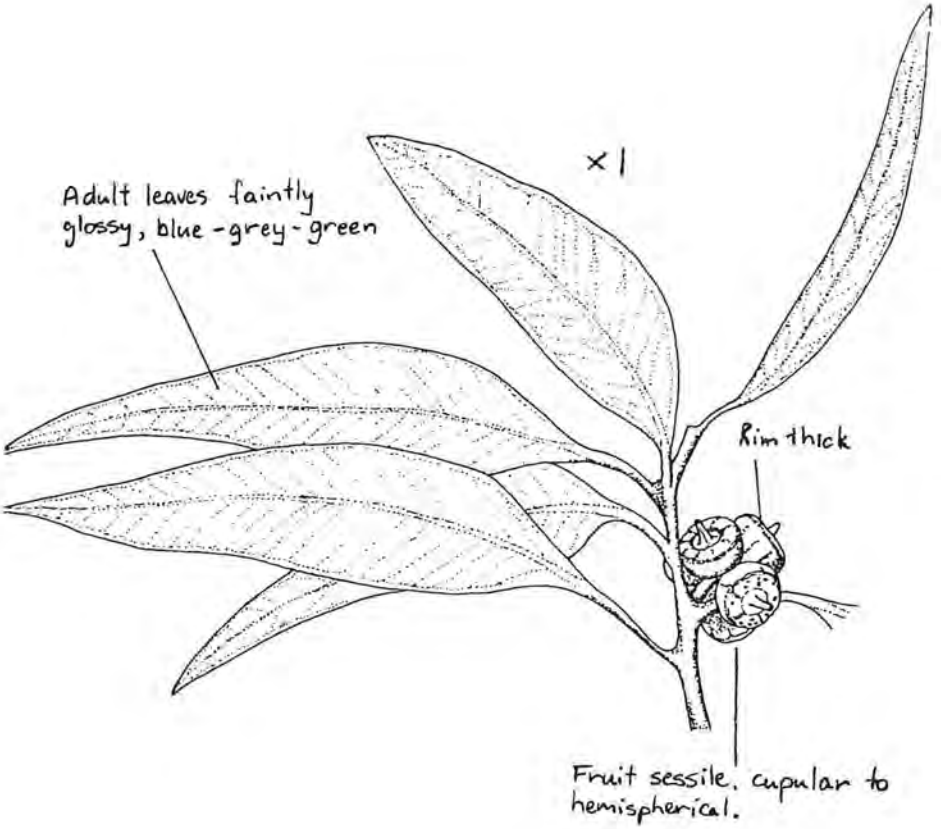
Flowering Period: February to March.

Additional Field Characteristics: A mallee or tree to 5 m with distinctive coarse, non-fibrous, loose, rough bark overlying thick, corky bark. The juvenile leaves are almost round and entire. Adult leaves are concolorous, faintly glossy and blue-grey green. The inflorescence is axillary and 7-9-flowered and the flowers are white.

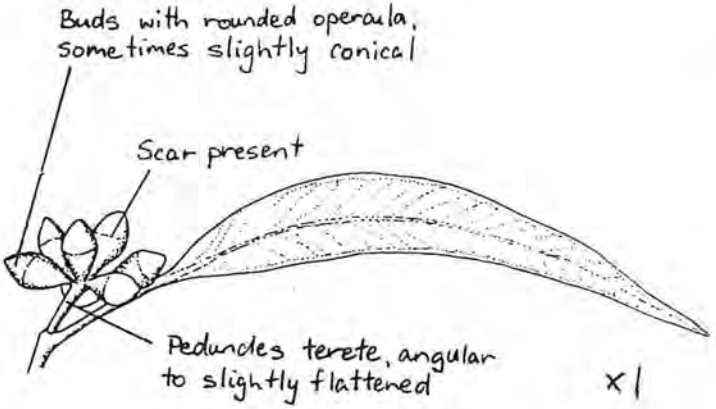
This species is related to *E. decipiens*, differing in its coarse, loose bark, entire juvenile leaves (*decipiens* has emarginate juvenile leaves) and rounded opercula (*decipiens* opercula acute, conical or beaked). *E. 'phy'* also has larger buds and fruits.

References: Brooker and Kleinig (ms), CALM staff (pers. comm.).





Inflorescence 8-flowered.



EUCALYPTUS X 'RIVALIS' Blakely ined.

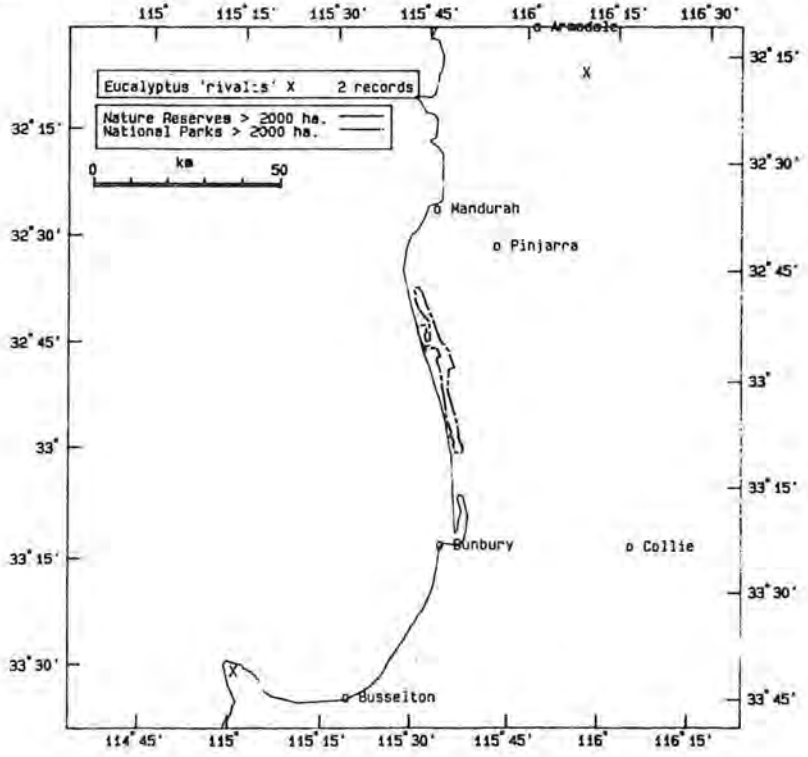
Distribution and Habitat: Known from only two locations; one 48 km south of Perth near Albany Highway and a second near Cape Naturaliste on brown sandy loam with *E. megacarpa* and *E. marginata*.

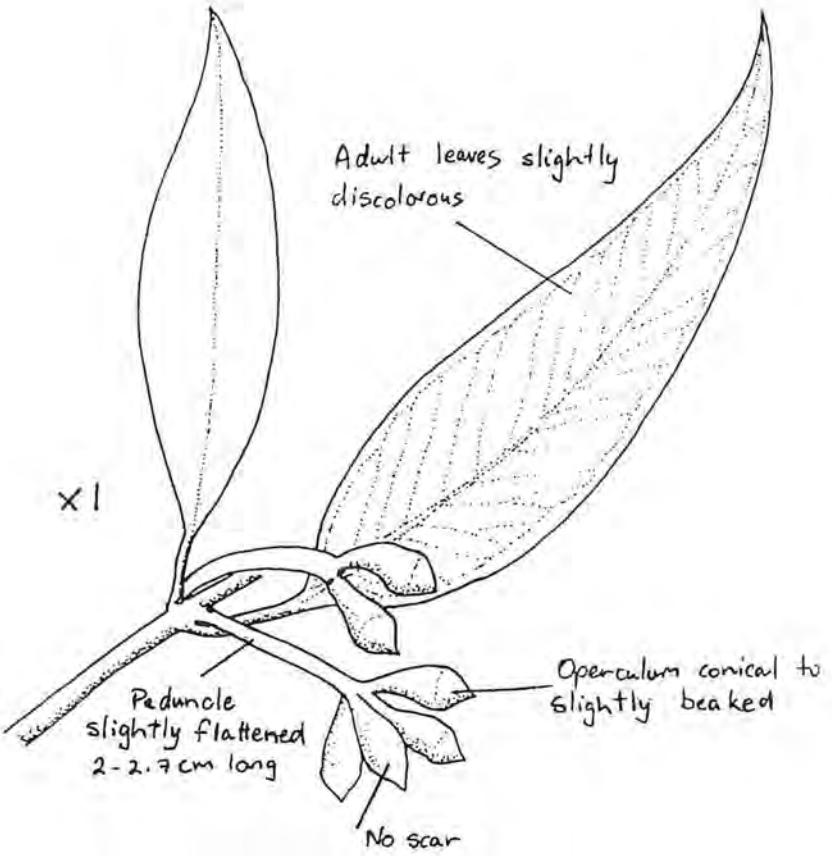
Flowering Period: Unknown.

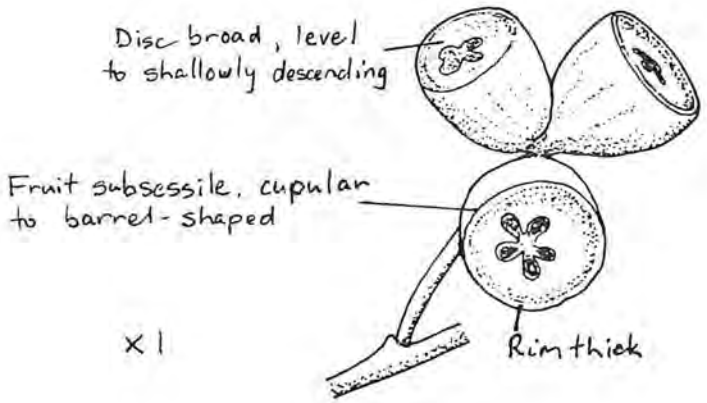
Additional Field Characteristics: *E. 'rivalis'* is believed to be a hybrid between *E. marginata* and *E. megacarpa* and has many intermediate characteristics of these two species. A tree of 4-5 m tall with coarse, furrowed grey bark on the trunks. Juvenile leaves are opposite and ovate to broadly lanceolate.

The fruits are of a similar shape to those of *E. marginata* but are larger (1.5 m x 2 cm; *marginata* - 0.9-1.6 x 0.9-1.5 cm) and sub-sessile (*marginata* pedicellate). The buds are broader with conical to slightly beaked opercula (*megacarpa* strongly beaked, *marginata* conical to horn-shaped), and a slightly flattened peduncle.

References: Pryor and Johnson (1962), G. Keighery (pers. comm.).




Adult leaves slightly discolorous
x 1
Operculum conical to slightly beaked
Peduncle slightly flattened 2-2.7 cm long
No scar


Disc broad, level to shallowly descending
Fruit subsessile, cupular to barrel-shaped
x 1
Rim thick

EUCALYPTUS AFF. RUDIS

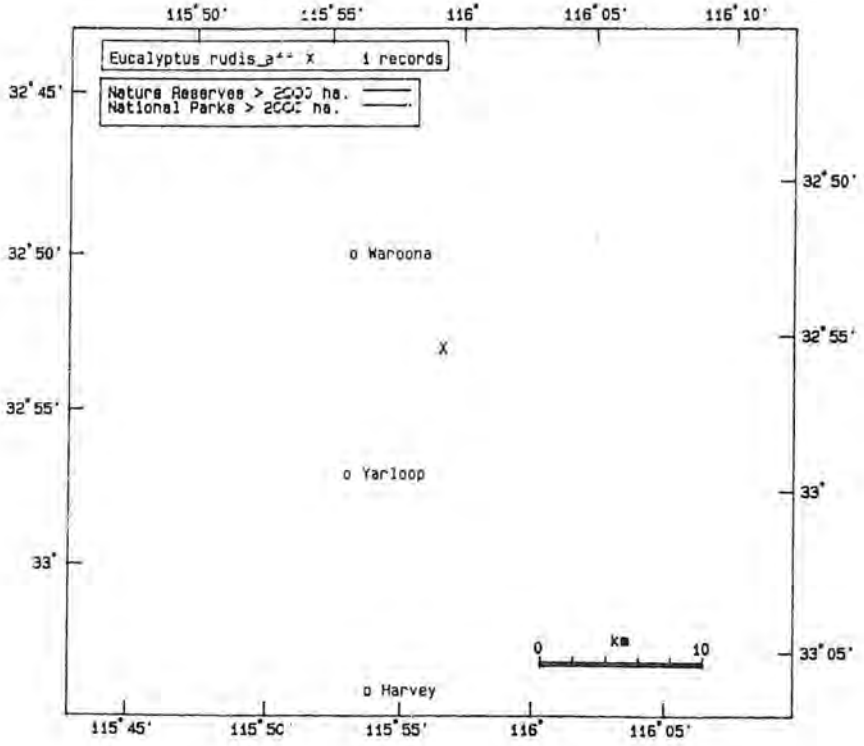
Distribution and Habitat: One known location approximately 6 km ENE of Wagerup growing on a steep slope at the foot of a steep granite sheet. Occurs as an emergent from dense low heath including *Calothamnus quadrifidus* and *Dodonaea ceratocarpa*.

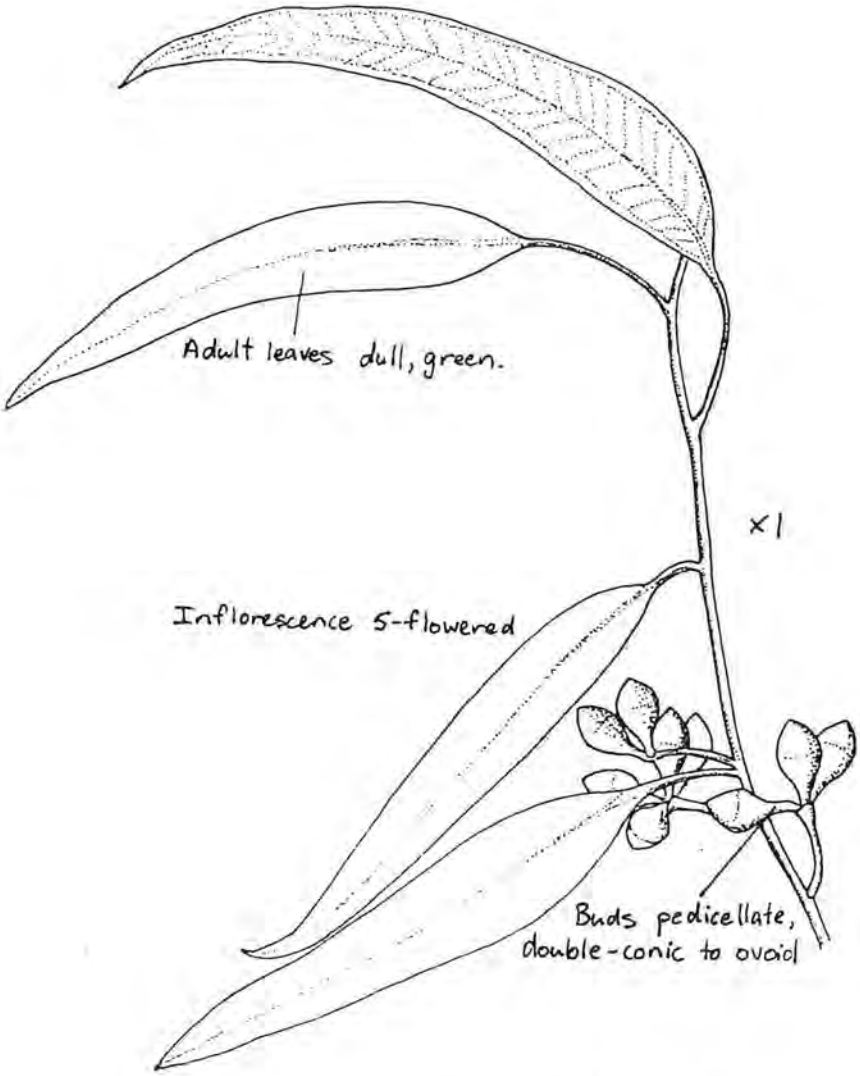
Flowering Period: ?September.

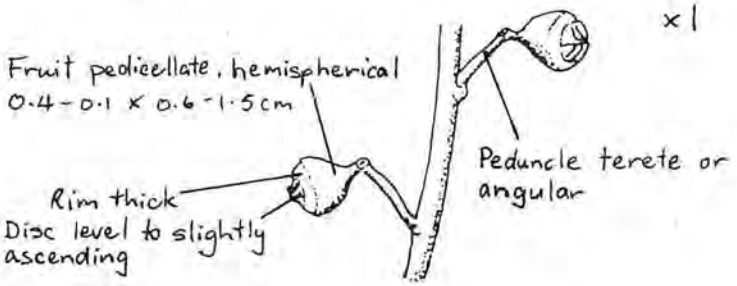
Additional Field Characteristics: A mallee with many straight erect stems to 4 m high. The stems have smooth grey over creamy-grey and powdery bark. The canopy is dull green. Inflorescences are 7-budded and the flowers are cream. The juvenile leaves are ovate and dull green.

This species differs from *E. rudis* in that it is a mallee with smooth bark (*rudis* a tree with rough grey-bark in the southern part of its range), has dull green adult leaves (*rudis* slightly glossy), and a 7-flowered inflorescence (*rudis* 7-11-flowered).

References: S. Hopper (pers. comm.).




Adult leaves dull, green.
x1
Inflorescence 5-flowered
Buds pedicellate, double-conic to ovoid


x1
Fruit pedicellate, hemispherical
0·4-0·1 x 0·6-1·5cm
Peduncle terete or angular
Rim thick
Disc level to slightly ascending

EUCALYPTUS RUDIS SUBSP. "DUNSBOROUGH"

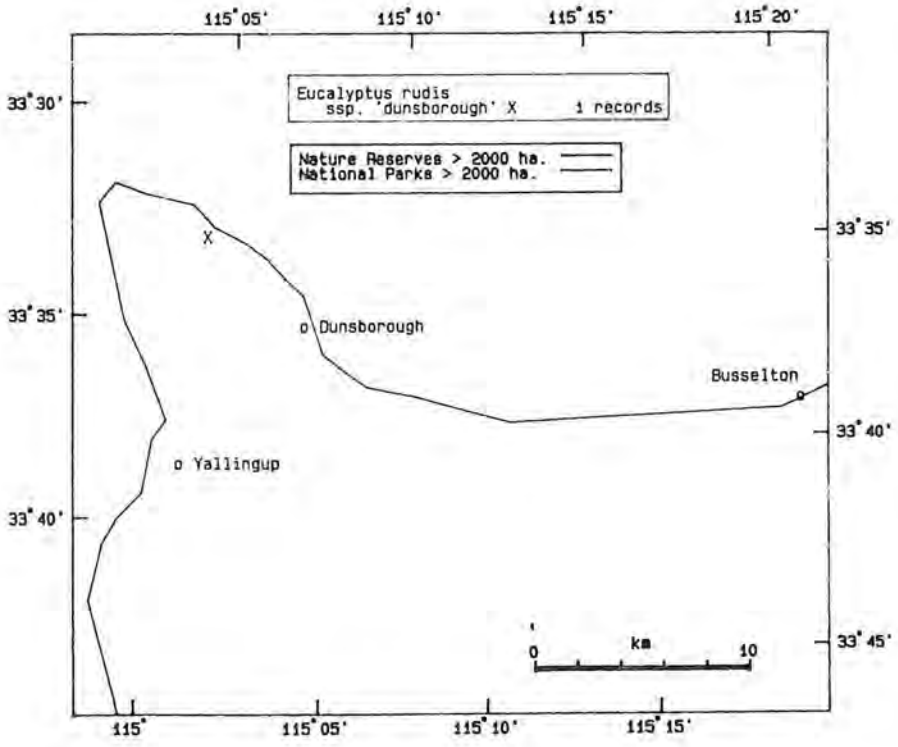
Distribution and Habitat: Several known populations between Eagle Bay and Quininup. Found in damp sandy or loamy sites with *E. calophylla, Melaleuca rhaphiophylla, Agonis flexuosa, Eucalyptus cornuta.*

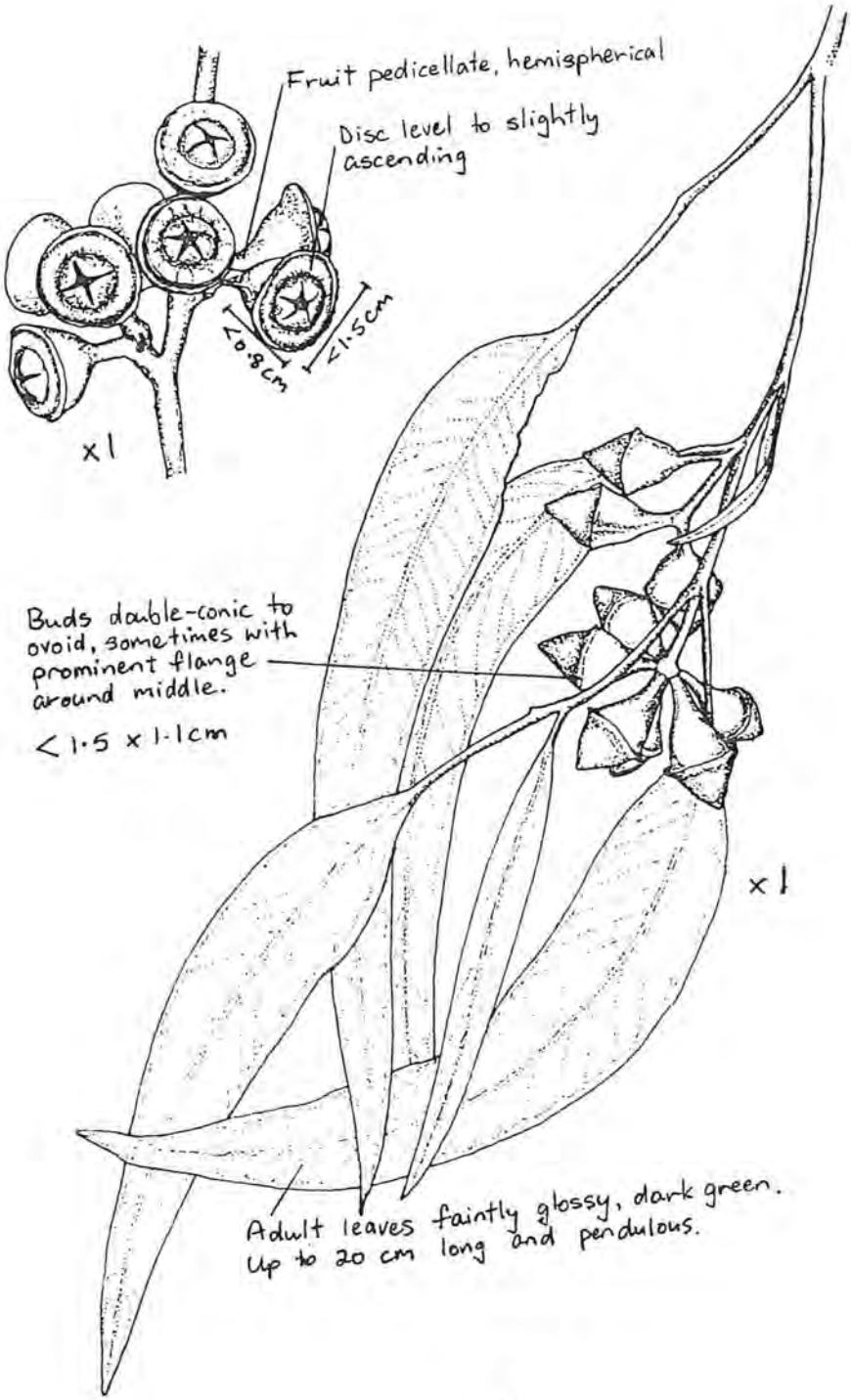
Flowering Period: Unknown.

Additional Field Characteristics: A tree to 10 m with rough, grey tessellated or furrowed bark. Adult leaves are generally falcate, up to 20 cm long and pendulous. They are faintly glossy and are dark green.

The "Dunsborough" subspecies differs from *E. rudis* in the larger size of its buds (*rudis* 0.8-1.2 x 0.4-0.6 cm), fruits (*rudis* 0.4-1 x 0.6-1.5 cm) and leaves (*rudis* 8-14 x 1.2-3 cm).

References: Hopper (pers. comm.).




Fruit pedicellate, hemispherical
Disc level to slightly ascending
<0.8cm
<1.5cm
x1
Buds double-conic to ovoid, sometimes with prominent flange around middle.
<1.5 x 1.1cm
x1
Adult leaves faintly glossy, dark green. Up to 20 cm long and pendulous.

EUCALYPTUS SARGENTII Maiden

Salt River Gum

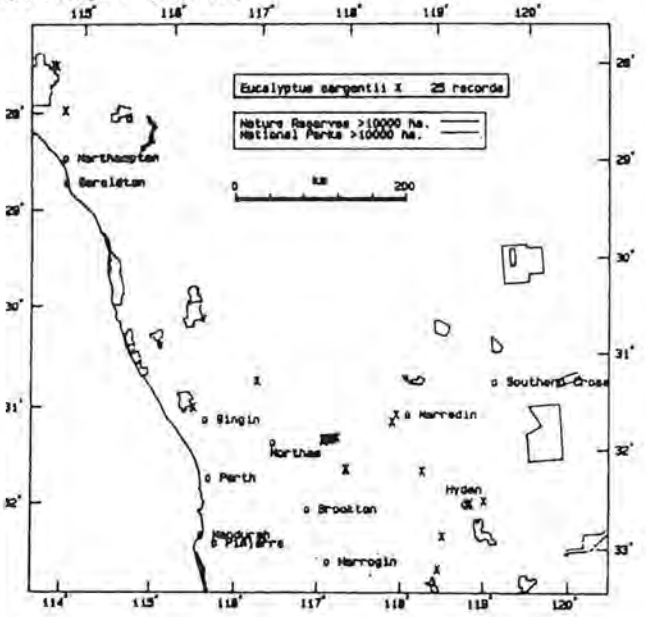
Distribution and Habitat: Has a limited and scattered occurrence in the wheatbelt particularly in the Quairading, Tammin, Hines Hill and Hyden areas but also extends to near Binnu and Eurardy in the north and southwards to Pingaring. Occurs near salt lakes in sandy loams or clays often in association with *Melaleuca* sp.

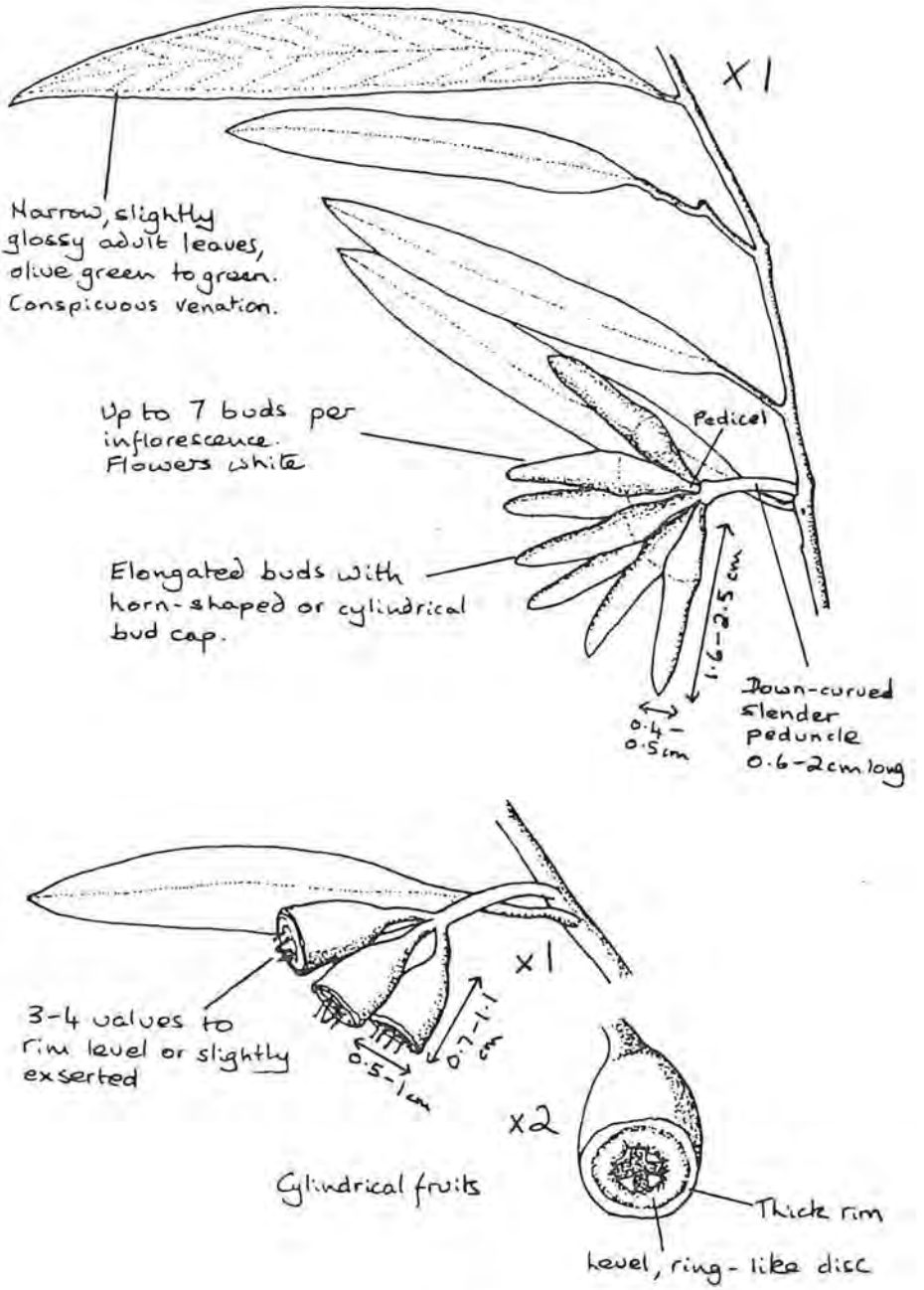
Flowering Period: October-January.

Additional Field Characteristics: A small tree up to 11 m in height with a short main trunk of c. 1 m, above which the branches are erect or spreading and with a dense, rounded crown. The basal bark is dark, rough and flaky but the branches are smooth, grey over coppery. Juvenile leaves are linear, to 12 x 0.6 cm. Adult leaves are 6-10 x 0.5-1.3 cm. The seeds are brown to red-brown.

E. sargentii is similar to *E. eremophila* but the latter has smooth bark throughout which is greyish over salmon pink to brilliant copper. Also, *E. eremophila* can have larger leaves (up to 2.3 cm wide) buds (up to 4 x 0.7 cm) and fruits (up to 1.5 x 1.2 cm) and its flowers are cream to yellow or pink. The adult leaves of *E. sargentii* have conspicuous venation whereas with *E. eremophila* the veins are obscured by the very numerous oil glands.

References: Brooker and Kleinig (ms); Elliott and Jones (1986); Chippendale (1974).




x1
Narrow, slightly glossy adult leaves, olive green to green. Conspicuous venation.
Up to 7 buds per inflorescence. Flowers white
Pedicel
Elongated buds with horn-shaped or cylindrical bud cap.
1.6-2.5 cm
0.4-0.5 cm
Down-curved slender peduncle 0.6-2cm long
x1
3-4 valves to rim level or slightly exserted
0.5-1 cm
0.7-1.1 cm
x2
Cylindrical fruits
Thick rim
level, ring-like disc

REFERENCES

Chippendale, G.M. (1973). Eucalypts of the Western Australian Goldfields (and the adjacent wheatbelt). Dept. Primary Industry. Aust. Govt. Pub. Serv. Canberra.

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Pryor, L.D. and Johnson, L.A.S. (1962). The status and significance of the hybrid *Eucalyptus marginata* SM x *E. megacarpa* F. Muell. Aust. J. Bot. 10(2) : 129-133.

Dr S.D. Hopper
Wildlife Research Centre
Department of Conservation and Land Management
P.O. Box 51, Wanneroo, W.A., 6065
Ph (09) 405 5100