








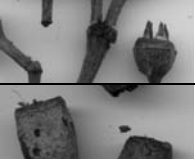







**COMMON EUCALYPTS AND RELATED SPECIES OF THE BELLINGER VALLEY:
TABLE OF RECOGNITION FEATURES**

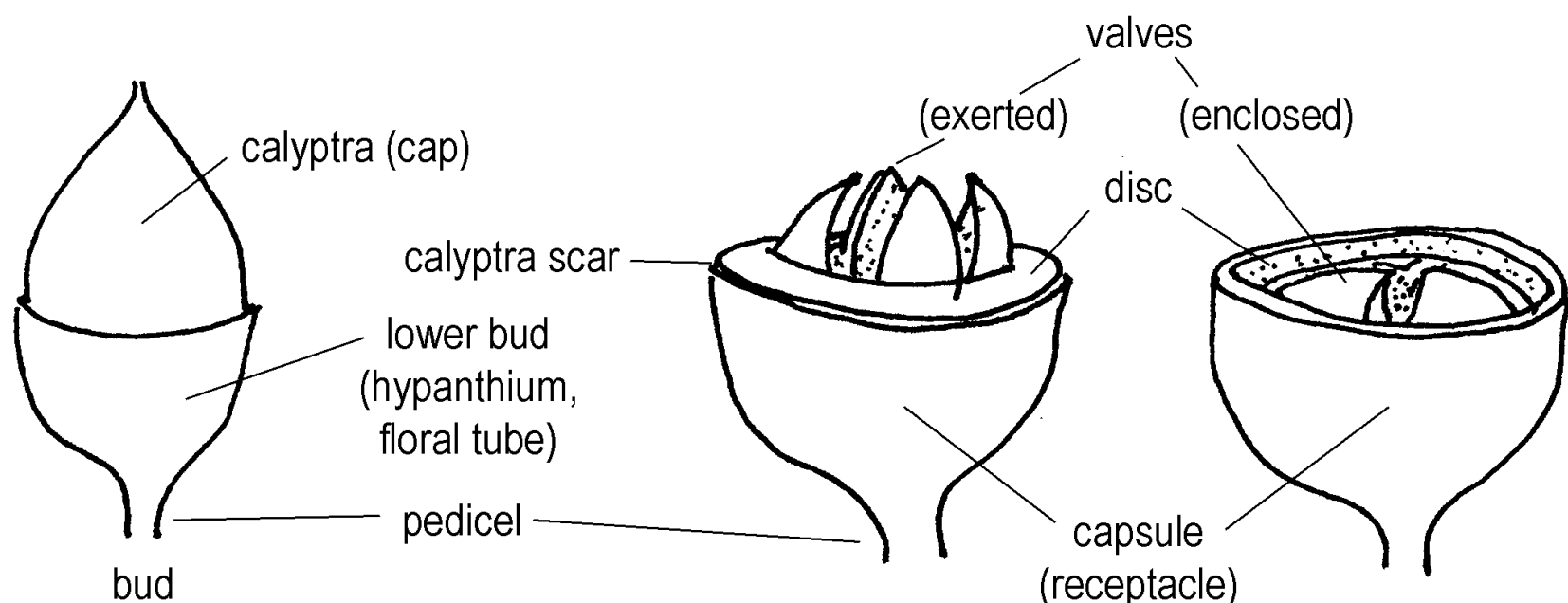
	SPECIES	BARK	FRUIT	BUDS	LEAVES	HABITAT*	CONFUSING SPECIES		
SMOOTH-BARKED	Flooded Gum <i>Eucalyptus grandis</i>	Smooth white or grey, shed in ribbons. Grey fibrous flaky bark usually persistent on lower trunk.	Pear shaped to conical. Valves in-curved.	Cap conical to beaked mostly glaucous.	Alternate, green glossy, bluish beneath.	WSF or Rf margins on fertile alluvial soils along relatively frost free gully floors.	Other smooth barked Eucalypts esp. Blue Gum, but fruits with incurved valves.		
	Blue Gum <i>Eucalyptus saligna</i>	Smooth pale blue-grey, shed in short ribbons or flakes. Sometimes persists on lower trunk.	Bell shaped to pear shaped. Valves almost erect or outcurved.	Cap conical to beaked.	Alternate green, glossy, paler beneath.	WSF (including escarpment) rather frost tolerant.	Other smooth barked eucalypts, especially Flooded Gum, but fruits with erect or out-curved valves.		
	Forest Red Gum <i>Eucalyptus tereticornis</i>	Smooth white with orange to grey – blue streaks.	Whole fruit almost globular with 2-3mm wide ascending disc.	Cap very long straight conical or bent near apex (pixie cap).	Alternate dull green colour on both surfaces.	Widespread at low altitudes esp. on alluvial flats and on heavy soils close to sea board. Usually in grassy forests or woodlands	Other smooth barked Eucalypts especially Blue Gum and Flooded Gum but raised disc on fruit, long cap on buds and concolourous leaves distinctive.		
	Small-fruited Grey Gum <i>Eucalyptus propinqua</i>	Granular matt, mainly pale grey, shed in large, irregular patches exposing yellow or orange colours.	Very small, hemispherical to conical fruit with flat to slightly raised disc.	Cap shortly conical to hemispherical sometimes beaked.	Alternate, dark green, glossy, paler beneath.	Prefers clay-loam soils on lower slopes extends to ridges where soil moderately fertile.	May confuse with Blue Gum, but granular matt bark distinctive.		
HALF-ROUGH	Blackbutt <i>Eucalyptus pilularis</i>	Rough bark persistent on lower half of trunk or up to main branches. Smooth above white to grey shed in ribbons.	Hemispherical to subglobular. Disc depressed or flat.	Cap conical or beaked.	Glossy green on both surfaces.	WSF or grassy coastal forest on lighter soils of medium fertility.	Brush Box has half rough-half smooth bark but Blackbutt leaves concolourous and not whorled Blackbutt buds capped; fruit shapes different. Smooth bark pale grey not pink		
EUCALYPTS	IRONBARKS (HARD, DEEPLY FISSURED & GREY-BLACK)								
	Northern Grey Ironbark <i>Eucalyptus siderophloia</i>	Grey black thick, tough, very hard, deeply fissured. Rough bark persistent to main branches, smooth above.	Conical, descending disc, valves flush with rim or slightly exerted.	Cap conical or beaked slightly narrower than lower bud.	Dull grey green both surfaces.	DSF on clayey soils in undulating coastal areas and foothills.	Very similar to Bellinger Grey Ironbark, but occurs in drier habitat.	Similar to following but vertical ridges not conspicuous	
	Bellinger Grey Ironbark <i>Eucalyptus ancophila</i>	Dark grey-black as above. Rough bark persistent to small branches.	Broadly conical to ovoid. Slight vertical ridges on side. Valves deeply enclosed.	Cap conical shorter and narrower than lower bud.	Glossy green both surfaces or slightly paler below.	WSF in lower slope and valley positions in sub coastal ranges and foothills. (Only in Bellinger- Macleay region.)	Very similar to Northern Grey Ironbark, but mostly occurs in moist gullies.		
	OTHER ROUGH-BARKED (STRINGY or MATTED, & BROWN)								
	Tallowwood <i>Eucalyptus microcorys</i>	Orange brown, soft in longitudinal, stringy slabs with horizontal breaks. Persistent to small branches.	Conical to pear shaped. Disc descending. Valves 3.	Cap hemispherical with fine ribs.	Glossy green, paler beneath. Open looped venation.	DSF, WSF & Rf margins, tolerant of poor soils but prefers moist rich forest loam.	Other rough barked species. Fruit paler & less woody and usually prolific. Horizontal breaks in bark are distinctive.		
	White Mahogany <i>Eucalyptus acmenoides</i>	Grey brown, finely sub-stringy.	Hemispherical to globular truncate. Disc usually narrow, flush with rim or enclosed.	Cap conical beaked.	Thin, green, paler below.	DSF or WSF on soils of fair to moderate fertility, typically on slopes & ridges on undulating to hilly country.	Thick-leaved White Mahogany has less discolourous leaves. Tallowwood bark is less stringy and lacks horizontal breaks in bark.		
	Red Mahogany <i>Eucalyptus resinifera</i>	Grey brown, finely sub-stringy.	Hemispherical to ovoid. Disc flat to raised. Valves exerted.	Buds up to 16mm. Cap longer than lower bud, up to 12mm, horn shaped.	Green, glossy, paler beneath.	DSF & WSF on gentle topography. Common on light podsol soils.	Other rough barked eucalypts, particularly white mahogany. Strongly exerted buds and long cap on bud are distinctive.		
	Swamp Mahogany <i>Eucalyptus robusta</i>	Fibrous or sub stringy, red brown in longitudinal spongy slabs. Persistent to smallest branches.	Prominently cylindrical. Valves joined across opening forming + sign.	Buds up to 25mm long. Cap conical up to 12mm long.	Broad, dark green, glossy, paler beneath.	SSF or WSF on light to heavy soils where drainage impeded. Rarely far from sea board.	Swamp Turpentine.. Long fruits are distinctive. Leaved not whorled. Can withstand and usually found in wetter sites		
	Pink Bloodwood <i>Corymbia intermedia</i>	See NON EUCALYPTS (BLOODWOODS, ANGOPHORAS, ETC.) over-leaf. Bloodwoods were formerly classified as <i>Eucalyptus</i> species but, although closely related, they are now classified as <i>Corymbia</i> species.							

* Habitat and distribution details are primarily for the Bellinger Valley. Some species may have distributions across slightly different landscapes in other catchments.

	SPECIES	BARK	FRUIT	BUDS	LEAVES	HABITAT	CONFUSING SPECIES		
NON-EUCALYPTS (BLOODWOODS, ANGOPHORAS, ETC)	SMOOTH BARK Smooth-barked Angophora <i>Angophora costata</i>	Smooth, dimpled, pink grey to reddish, shed annually.	Capsule with conspicuous longitudinal ribs sometimes terminating in teeth above the rim.	On branch ends. Buds bristly without caps.	Opposite, green, paler beneath. Veins parallel 50-80° angle with mid vein.	Near coast on sandstones and old dunes. Also on shale ridges.	Smooth barked Eucalypts, especially Spotted Gum, but with dimpled bark, no cap on buds, ribs on fruit and opposite leaves.		
	HALF-ROUGH Brush Box <i>Lophostemon confertus</i>	Rough brown bark on lower trunk, smooth green to pinkish brown on upper trunk.	Hemispherical	Buds without caps.	Broad, alternate on mature branchlets. Crowded in pseudo whorls on branchlet ends.	Rf or WSF often as emergent in or near the edge of Rf margins.	Blackbutt is similarly half barked but Brush Box has broader leaves and the upper smooth trunk is pinkish to greenish not greyish white.		
	ROUGH-BARKED	Swamp Turpentine <i>Lophostemon suaveolens</i>	Red brown, fibrous-papery, persistent.	Hemispherical, sepals persistent in fruits.	Buds without caps.	Leaves in pseudo whorls of 3-4.	Sclerophyll forest common in coastal districts often on swampy & poorly drained ground or alluvial flats.	Swamp Mahogany. Swamp Turpentine is less tolerant of prolonged inundation and has leaves in pseudo whorls..	
		Turpentine <i>Syncarpia glomulifera</i>	Fibrous-stringy, deeply furrowed persistent bark.	A number of fruit fused into a multiple fruit forming a distinctive "space ship" capsule shape.	Buds fused, no caps.	Opposite along branchlets, in pseudo whorls on branchlet ends. Upper surface dark green; lower whitish, hairy.	Often emergent near margins of Rf or in WSF. Often on heavier soils. Coastal and lower ranges.	Other rough barked species esp. Tallowwood but differs in leaf arrangement and colour and fused multi-receptacle fruit.	
	Pink Bloodwood <i>Corymbia intermedia</i>	Rough, short fibres forming tessellated pattern. Persistent to smallest branches	Distinctive ovoid to urn shaped, characteristic of Bloodwoods (<i>Corymbias</i>)	Conspicuous on outer branches. Buds with a cap.	Alternate, dark green, paler beneath. Lateral veins parallel at 60-70° angle with mid rib.	DSF undulating to hilly terrain on low fertility soils. Occasionally WSF and Rf margins in sheltered valleys on coastal ranges.	Red Bloodwood occurs on drier, less fertile ridge. Rough barked eucalypts don't have tessellated bark or large, urn-shaped fruits.		

GLOSSARY

Alternate	Of leaves – arising singly from different points on the stem (cf. opposite). Also called disjunct.
Calyptra/cap	Cap-like covering of the flower, formed from fused petals and/or sepals, and shed when the flower opens
Concolourous	Of leaves – similar in colour and texture on both sides.
Disc	Ring around the opening of the capsule (receptacle) inside the calyptra scar; may be flat, domed, ascending, or descending.
Discolorous	Of leaves – different in colour on either side, having a distinct upper and lower surface.
DSF	Dry Sclerophyll Forest. Open forest of medium (<30m, usually <20m) height, dominant trees usually branching at less than half their height
Glaucous	Dull blue-green to pale grey colour
Gum	In the broad sense all eucalypts, bloodwoods and angophoras; in the narrow sense only smooth-barked eucalypts
Opposite	Of leaves – arising from the same level, on opposing sides of the stem (cf. alternate)
Rf	Forests dominated by soft-leaved trees with a foliage canopy cover > 70%
Sclerophyll forest	Forest dominated by hard-leaved trees such as eucalypts with a foliage canopy cover of 30%- 70%
SSF	Swamp Sclerophyll Forest. Open sclerophyll forest growing on swampy ground, usually dominated by paperbarks, Swamp Mahoganies or Swamp Oaks.
Tessellated	Of bark – dividing into squarish, blockish segments. Common in bloodwoods.
Valve	Segment of the top of the fruit that opens to release seed.
WSF	Wet Sclerophyll Forest. Tall (>30m) moist forest in which dominant trees are usually unbranched for most of the length of their trunks. Shrubby or ferny understoreys



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EUCALYPT RECOGNITION

Key Features

Their are a number of key features to look for when distinguishing one species of eucalypt from another:

Bark: Is the bark smooth or rough? Smooth barked eucalypts shed their bark each year (usually in summer). Is it shed in long ribbons or small patches? Is some rough bark retained at the base of the trunk? What colour and texture is the smooth bark. Rough barked eucalypts retain their bark. Is the rough bark stringy, shortly fibrous, matted or hard? Is it in small tiles (*tessellations*) or deeply furrowed? What colour is it?

Fruit. Also called *receptacles*, capsules or 'gum nuts'. Is the fruit large or small? Do the little valves that open on the top to release the seeds stick out above the rim of the capsule (*exerted*) or are they enclosed within the rim of the capsule? Does the rim slope up (ascending) or down into the capsule (*descending*)? Is the fruit hemispherical, bell-shaped, urn-shaped or conical?

Location & Habitat: Where a eucalypt grows is very important for recognition. Of the 700-800 species only about 20 or so grow naturally in the Bellinger Valley. Species from other areas that have been planted are very difficult to distinguish. Each local species also has its preferred soil and water conditions. Swamp Mahoganies like swamp and its edges. Forest Red Gums like heavy soils and coastal floodplains. Flooded Gums like better-drained floodplain soils and lower slopes. Blue Gums and Tallowoods like moist gullies and ridges. Blackbutts and Red Mahoganies like well-drained soils & ridges. Most of the eucalypts in this guide are trees of tall forest, ranging from moist shrubby Wet Sclerophyll Forest to drier ridge-top Wet Sclerophyll and almost Dry Sclerophyll. Forest Red Gums are often in Grassy Woodland.

Buds: The buds consist of a base (the floral tube) and a cap (*calyptra*) that falls off to reveal the stamens. What shape is the cap? Is it long and conical like a dunce's cap, rounded and peaked like a minaret or like one of Bib & Bub's caps?

Leaves: Are the leaves the same on both sides (*concolourous*) or darker on top and paler below (*discolourous*)? Concolourous leaves are adapted to dry conditions. Most local species are discolourous. Are they opposite one another (*Angophora* and juvenile *Eucalyptus*), are they alternate (adult *Eucalyptus*), or are they in whorls—i.e. several radiating from one level, usually the end, of the branchlet (Brush Box and Turpentine)? Are the veins evenly spaced? What angle do they make with the mid-vein?

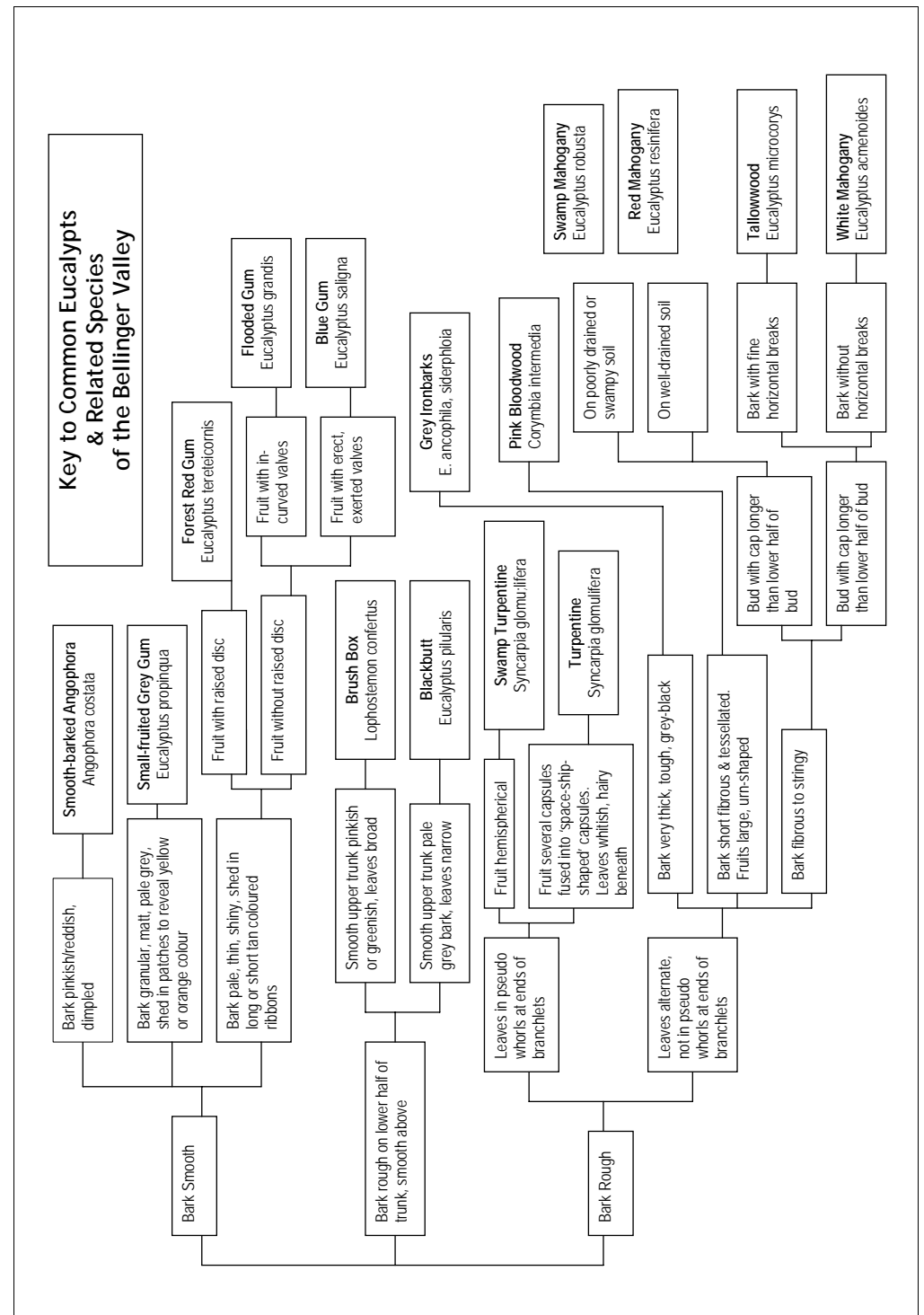
How to use the Table and Key.

This recognition guide gives two tools for eucalypt recognition: a table and a key. Both treat the bark as the primary feature. The table lists several features for each species. The key is used by making a choice at each branching point in the 'tree', and following the chosen branch to the next branching point until you arrive at the identification.

Note: Not all the Bellinger Valley species are included. Only the most common. The table and key will not work on planted species from other regions.

Common Species of Neighbouring Areas (but are not in the Valley): Scribbly Gum, *E. signata* (Coffs, Nambucca); Spotted Gum, *Corymbia variegata* (Orara, Grafton) & *C. maculata* (Nambucca); White Gum, *E. nobilis*, New England Blackbutt, *E. campanulata*, and Messmate, *E. obliqua* (all on Dorrigo Plateau)

Commonly Planted non-local Species: Dunn's White Gum, *E. dunnii*; Cadaghi, *Corymbia torrelliana*.



Ecology

Flowering & Pollination

Eucalypt flowers depend on birds, flying foxes and insects for their pollination. Those with copious nectar attract Flying Foxes (e.g. Forest Red Gum, Swamp Mahogany, White Mahogany, Pink Bloodwood). Others, such as Tallowwood are poor in nectar and rely on insects. Most local species flower annually, except for Grey Gum (biennially). Flowering time and abundance differs from year to year and species to species.

Fruit and Seed

Ripe fruits open in warm dry weather, after fire, or when they dry out after they have been dislodged from the tree. The seed is fine but seldom spreads more than a tree height from the parent tree. The bulk of the seed released from each capsule is sterile (called *chaff*). Germination requires moisture, and the seedlings are very small. In cases where the ground is covered in leaf litter or shaded, small seedlings are likely not to thrive and to succumb to fungus attack. Seedlings of most species survive best in bare mineral soil caused by flood, slips and machinery or soil where fire has removed the litter.

Fire

Apart from the adaptation to post fire colonisation of litter-free soil, most eucalypts are well adapted to surviving fires. After fires, and depending on the species, age and fire intensity, they re-shoot from epicormic buds (under the bark) or from lignotubers (woody underground stems).

Associated Species

Many animal species rely on eucalypts. Birds, bats and insects eat the nectar. Birds eat the seeds, lerps (sweet secretions of *Psyllid* insects), and insects that use the trees. Mammals (e.g. Koalas) eat leaves. Their preferred local species include Forest Red Gum, Tallowwood and Grey Gum. Old trees provide nesting hollows for birds, bats, arboreal marsupials and reptiles. Humans use the timber, they cultivate eucalypt plantations, and they manage eucalypt forests.

Management & Restoration of Eucalypt Forests

Locally, eucalypt regeneration has largely depended on natural regeneration after fire, but this is hard to manage artificially, and seedlings nowadays have to compete with vigorous weeds such as Lantana. Traditional minimal disturbance bush regeneration techniques seldom create the conditions for seedling germination and survival, and usually have to be supplemented by fire or removal of litter. Plantings depend on good species selection, but given the diversity of native species, the variability forest types over the landscape, and changes to the natural soil condition, it is not always easy to predict what will do well. The best rule of thumb is to use local species from adjacent forest growing on similar soil.

Further Reading

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EUCALYPTS OF THE BELLINGER VALLEY

A guide to their recognition

What is a Eucalypt?

The word eucalypt, in its broad sense, refers to several similar and closely related groups (or genera) of trees. As well as the *Eucalyptus* genus, these include the Bloodwoods (*Corymbia*), the Angophoras (*Angophora*), Brush Box (*Lophostemon*) and Turpentine (*Syncarpia*). The term 'gum' is also applied to all of these, although it is also used more narrowly to refer to smooth-barked eucalypts.

The name *Eucalyptus* comes from the Greek meaning 'well capped' (*eu - calypt*). It refers to the little caps or *calyptras* that are shed from the buds to reveal the stamens. Only *Eucalyptus*, in the strict sense, and the Bloodwoods have this feature. Even so, Bloodwoods are believed to be more closely related to the *Angophora* than to the *Eucalyptus*. A family tree below shows the relations of the trees described in this guide.

Evolution of the Eucalypts

There is evidence of eucalypt-like species dating from at least 25,000,000 years ago. A branch of the Myrtle Family they became more common as Australia became drier and the once extensive rainforest contracted. During the last 2,000,000 years, gradual drying coupled with repeated Ice Age cycles have seen the increasing differentiation of the eucalypts into hundreds of species adapted to nearly every combination of soil, water and temperature that the continent had to offer.

Up until 100,000 years ago, the drier landscapes of Australia were dominated by casuarinas, callitris (native cypress), acacias and grasses. Only in the last 100,000 years have the eucalypts actually come to dominate the majority of Australian landscapes. This may be due to the presence of humans. Although fire has been part of Australian landscapes for millions of years, the use of fire as a landscape tool is probably led to increased fire frequency across the continent, and the eucalypts had evolved very good adaptations to fire.

Family Tree of the Eucalypts and Their Close Relatives

