**Association of Societies for Growing Australian Plants Eucalyptus Study Group ISSN 1035-4603**

# *Eucalyptus Study Group Newsletter*

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1. Thanks To Rod Kent for contribution of this article

**Eucalypts in New Zealand and fungi**

Author: sporesmouldsandfungi | Filed under: Fungi, History, Mushrooms, Mycology, Science

The Press newspaper feature an article about  a day in the life of Christchurch in 21 May 1861 to celebrate the newspaper's 150th anniversary. The author, Mike Crean walks around the streets of 1861 Christchurch and notes:
Two men seem to eye me hopefully. They are standing in front of a high fence where posters advertising musical and theatrical events are pasted. They are waiting for someone to offer them work. "See those young gum trees around the Square," says one. "we planted them. It was a Provincial Council work scheme."

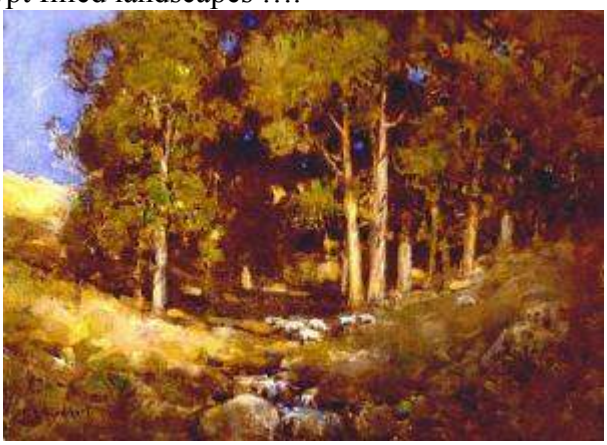
Eucalypts in Cathedral Square, Christchurch, 1861

*Eucalyptus* species have been important part of New Zealand's urban and rural landscape, as both shade and plantation trees, despite not being a native genus. Since the official beginning of European colonisation of New Zealand in 1840 some 180 species of *Eucalyptus* have been introduced. Of these, 19 species have become fully naturalised, that is they have formed self-maintaining populations in the wild. A further 7 are considered to be 'casuals', that is they are either found only occasionally in the wild or only present in the wild close to planted parental trees.

The oldest eucalypt in New Zealand, a blackbutts (*E. pilularis*), was planted on the Manukau Harbour in 1836 (Burstall and Sale, 1984. Great trees of New Zealand). The tallest tree in New Zealand is reputed to be a mountain ash (*E. regnans*) growing at the the Orokonui Ecosanctuary near Dunedin at 77.4m high and 141 years-old. Not far from my home in Marlborough is the 'Woodbourne Gum' (*E. viminalis*) planted by a local farmer and politician, Henry Godfrey, it is 161 years-old and 47m high.

The Woodbourne gum

Eucalypts, such as red flowering gum (*E. leucoxylon)* far from being a problem have become significant in the landscape as a food source for nectar eating native birds such as tui and bell birds.
New Zealand's long association with eucalypts means that they are part of our culture. In Katherine Mansfield's *At the Bay*:
Then something immense came into view; an enormous shock-haired giant with his arms stretched out. It was the big gum-tree outside Mrs. Stubbs' shop, and as they passed by there was a strong whiff of eucalyptus.
And Margaret Stoddart's eucalypt filled landscapes ….



Margaret Stoddart's Landscape with wood and sheep

as well as Footrot Flat's gum tree gate post (Murray Ball).


Footrot Flat's (Murray Ball)

A topic we do not know much about is eucalypts as a habitat for a dististinctive if not unique set of fungi. About 220 species have been recorded from eucalypts in New Zealand but many of these are leaf-spot and disease causing fungi. Of the larger fungi about 70 are wood decaying species, such as *Piptoporus portentosus* and *Chondrostereum purpureum*, have been recorded.

Brackets fruitbodies of *Piptoporus portentosus*

Some of the mushroom decay fungi found on eucalypts include: Armillaria novaezelandiae, Gymnopilus junonius, Hypholoma brunneum.

All eucalypts form mycorrhizal association with mushrooms, such as Amanita muscaria, and truffle-like fungi, such as Descomyces albus, are known. Although small number, as far as we know, of truffle-like species of mycorrhizal fungi are important to the growth and health of the trees.

Truffle-like Descomyces albus

There are probably many more'truffle-like species to be discovered but some that are known to be here are: *Hydnangium carneum, Hysterangium inflatum, Hysterangium rupticutis, Mesophellia glauca, Octaviana tasmanica, Scleroderma cepa, Scleroderma verrucosum*

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**The Eucalypt's survival secret**

By Danny Kingsley – ABC Science Online

Source: http://www.abc.net.au/science/articles/2002/02/11/477019.htm

The eucalypt trees burnt in Australia's recent bushfires are already sprouting again — and one botanist has worked out how they do it.

Dr Geoff Burrows from the Department of Agriculture at Charles Sturt University has discovered that eucalypts regrow in a way unlike any other tree in the world.

His findings have overturned long held beliefs about eucalypts, which had always been assumed to 'bud' like all Northern Hemisphere trees.

"People just assumed that because all trees in the Northern Hemisphere are the same, eucalypts will be too," explained Dr Burrows, who has spent the past five years on the research.

Northern Hemisphere trees like oak and willow have buds near the bark surface. They can resprout from the ground if they are chopped down but, unlike eucalypts, are unable to regenerate if they are burnt in a fire, because the buds are killed.

Dr Burrows has found that the lumps on the bark of eucalypts are not actual buds but are connected to bud-forming tissue located beneath the bark. The connection is via tubes called "bud traces" which run from the centre of the tree through the wood to the bark.

"If you follow one of the lumps back in along the tube, when you get near to the bark or the inner wood, you find cells that will make buds if the tree gets the signal," he said.

While all trees have bud traces, including those in the Northern Hemisphere, eucalypts bud traces are the only ones that don't end in an actual bud.

The placement of the bud-forming tissue in the eucalypt bud trace means it can lose 2 cm of bark in a fire and still be able to regenerate.

"As long as the whole tree doesn't get killed, there will still be some of this bud-forming tissue somewhere in what's left of the bark," explained Dr Burrows.

The bud-forming tissue forms buds in response to signals such as a lack of photosynthesis, which happens when green leaves are burnt off a tree.

Unlike other trees, eucalypts are not restricted to sprouting from the ground. They can resprout from any point on the tree even five to 10 metres up in full sunshine.

"It gives them a real head-start on other plants that might be trying to restart after a fire," said Dr Burrows.

He said the difficult task of cutting thin sections of eucalypt involved the use of a new technique in which liquid plastic was poured into the wood and then set before cutting.

"It's nice that eucalypts really are different," said Dr Burrows. "Because of the environmental pressures they have been under they have come up with something that has enabled them to get a competitive advantage on other plants."

Dr Burrows' research was published in the January 2002 issue of the journal *New Phytologist*.

**……**

**Unusual Eucalypt a genetic engineering pioneer**

By Bob Beale - ABC Science Online

Source: http://www.abc.net.au/science/articles/2002/12/12/745443.htm

New genetically engineered species of eucalyptus trees that produce better wood fibre and grow faster - but are less attractive to native animals - are on the drawing boards for Australian forestry plantations, researchers said.

Dr Simon Southerton of CSIRO Forestry and Forest Products, a specialist division of the Commonwealth Scientific & Industrial Research Organisation, said the new trees would be based on an unusual early-flowering eucalyptus species from Western Australia.

Known as *Eucalyptus occidentalis*, it was selected as a potential workhorse for genetic engineering after screening 11 families of eucalypts species from around the country.

CSIRO scientists hope to use the tree to develop new gum tree species with desirable traits - such as superior wood fibres, the ability to grow rapidly and a resistance to insects and herbicide - for the nation's rapidly expanding native forest plantations.

The plant, also known as flat-topped yate, is native to the south-west of Western Australia. As with most forest trees, gums often take years to form their first flowers and seeds. Selective breeding of the best strains for forestry has been hampered by long breeding cycles.

But if the flat-topped yate is given optimum light, temperature and nutrients, its flowers start to form within just 13 weeks of germination, the researchers found. By about seven months, its floral buds have matured and begun opening.

Such rapid maturation could drastically shorten the time needed to learn whether a desired gene modification will be passed on to a tree's progeny.

Research into transgenic gums is still at early stages and such trees in Australia can only be grown in special containment glasshouses approved by the Office of the Gene Technology Regulator, a federal statutory authority.

CSIRO scientists have so far achieved successful single-gene transfers into eucalypts using a special 'reporter gene' that lets them confirm the newly inserted transgene is active.

The transfers were achieved by piggybacking the reporter gene into *E. occidentalis* utilising the crown gall bacterium, commonly used in laboratories globally to add new genes material to plants.

Southerton said some transgenic gums may need to be rendered sterile, to prevent their transgenes from escaping into native forests and causing potential and unforeseen ecological disruption. The obvious way of doing this is to insert genes that prevent flowering, stopping transgenic plantation gums from cross-pollinating with trees in the wild.

Genes that control flowering in eucalypts have been isolated, and work is under way to try to engineer sterile trees by disrupting them. The flat-topped yate will play an important role in this research: "It means we will be able to test very quickly whether the sterility genes are working," said Southerton, who is working with John Watson at CSIRO Plant Industry on the project.

Because eucalypts invest large amounts of energy in flowering and producing nectar and pollen, sterile trees would probably divert the saved energy into growing more wood.

Non-flowering plantations would be less attractive to native mammals, birds and insects that feed on nectar and pollen, potentially reducing the toll on these species when the plantations are logged, the researchers believe.

Other genes could be added to deter defoliating pests like Christmas beetles, sawfly larvae and other insects, which reduce tree vigour and productivity.

Scientists in Brazil - which has the world's largest eucalypt plantations - are also working to develop transgenic gums using a tropical hybrid of *E. grandis* and *E. urophylla*, widely used in reforestation programs in South America.

The first transgenic plant to express a foreign gene was tobacco in 1983. Since then, more than 90 different species have been genetically modified, including forest trees such as poplar and walnut.

**…….**

**Abstract**

**The influence of depth-to-groundwater on structure and productivity of *Eucalyptus* woodlands**

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Although it is well documented that access to groundwater can help plants survive drought in arid and semiarid areas, there have been few studies in mesic environments that have evaluated variation of vegetation characteristics across a naturally occurring gradient in depth-to-groundwater (DGW). The aim of this study was to determine whether differences in groundwater depth influence structural attributes and productivity of remnant woodlands in south-eastern Australia. The study area was located in the Kangaloon bore-field area of New South Wales, where DGW varies from 2.4 m to 37.5 m and rainfall is plentiful. We examined structural (leaf-area index, basal area, stem density, tree height, Huber value ($H_V$) and aboveground biomass) and functional (aboveground net primary productivity (ANPP)) attributes of seven woodland sites differing in DGW. We also used $\partial^{13}C$ analysis of sapwood across six sites, along with observed non-linear changes in

structural attributes, to infer groundwater use by trees. Significant differences in structural attributes and ANPP were observed across sites. The three shallowest sites with 2.4 m, 4.3 m and 5.5 m DWG had significantly larger aboveground biomass and ANPP than did the four deepest sites (DGW ≥9.8 m). Across all attributes (except $H_V$ in the summer, where the mean values were significantly larger at sites where DGW was 5.5 m or less and across the four deeper sites (DGW ≥9.8 m), there were no differences in these three structural traits, nor in ANPP. Despite finding no significant differences in $H_V$ across sites in the summer, in winter, the two deepest sites had a significantly larger $H_V$ than did the two shallowest sites. Significant increases in $\partial^{13}C$ of sapwood occurred across five of the six sites, consistent with increasing water-use efficiency as DGW increased, reflecting the declining availability of groundwater with increasing DGW. This study has demonstrated that even in a mesic environment, putative access to groundwater can have important impacts on structural and functional traits of trees and, consequently, on woodland productivity.

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**Can't hear the conversation for the trees**

By Danny Kingsley - ABC Science Online
Source: http://www.abc.net.au/science/articles/2002/06/12/578753.htm

Gum trees are causing headaches for mobile phone providers in rural areas because they interfere with the signal, a telecommunications company announced this week.

Country Wide, Telstra's rural arm which recently celebrated its second year, has found that groves of trees break mobile telephone signals.

And because gum trees are the most conspicuous trees in the country, they are being blamed.
"It has been a known fact for a long time that trees interfere with reception either by absorption or reflection," said Mr Roger Bamber, an engineer and Country Wide's NSW managing director. "It has been a problem since the 1950's and 1960's."

"I think the fact is we have a lot of eucalypts in Australia. Most of the corridors on rural roads are eucalypts," he said. "We think it is the size, shape and moisture content of the eucalypt leaves that absorbs or reflects the signal."

While this theory is not unfeasible, it is still speculation, says Dr. Alan Young, Research Leader with CSIRO Telecommunications and Industrial Physics.

"Trees of any sort have been known to block radio signals - they both absorb the signal and scatter it in many directions."

Dr Young's team have conducted measurements in rural areas and have recorded lower signals when they passed trees. "I don't think it's peculiar to gum trees; there is no evidence that gum trees are worse than introduced trees," he said.

It does appear, however, that moisture is the culprit. A dead tree absorbs fewer signals than a live tree without leaves, which absorbs less than a tree with leaves. Live trees with leaves that have rain on them absorb the most signals.

This is a problem that particularly affects rural customers. "In capital cities trees are not the major problem," said Dr Young. "Signals are more likely to be affected by interference from local traffic."

The problem came to Telstra's notice when people boating on the Murray River in southern NSW complained that they were losing the signal. The region is flat and well serviced by mobile phone towers. There should not be any problems for mobile phones. The area is, however, surrounded by dense stands of river red gums. Trees cause more of a problem for higher frequency signals, such as radar and LMDS, than for mobile phone

signals which transmit at less than 900Mhz. The issue for mobile phones is the number of trees that are between the signal point and the handset. "At around one to two GHz the effect of trees is relatively small," said Dr Young. "But once you get enough of them they can certainly block the signal."

Mr Bamber encourages people to use the external antenna in their car kits to get higher gain if they are going to be driving in rural areas.

Telstra anticipates this problem will also affect the satellite telephone network, being introduced soon. "Satellites need a clear line of sight, and eucalypts can affect that," said Mr Bamber.

All radio services at higher frequencies use satellite communication. "They need to see a lot of the sky to work because we are using a low earth-orbiting satellite," said Mr Bamber. "So if you are between two buildings, in a very dense grove of trees or in a deep ravine, you might not have continuous sighting of the satellite."

Because satellites are low powered they emit only what you need plus a little bit more, said Dr Young. The satellite signal comes in from a high angle so trees are only really a problem when the signal is low in magnitude.

"In country areas the signal can get pretty weak," he said.

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**Eucalypt reveals smelly secret**

By Dani Cooper; care of ABC
Source: http://www.abc.net.au/science/articles/2013/03/05/3701485.htm

Biologists have uncovered a yellowbox eucalyptus tree that is able to change the smell of its leaves from one side of the tree to the other to protect itself against predation.
The finding, published in the online journal *BMC Plant Biology*, answers a 20-year-old mystery surrounding a eucalyptus tree in a sheep paddock at Yeoval, New South Wales.
The tree at the centre of the study was almost totally defoliated by insects in 1990, but one branch was left completely untouched.
Lead author Amanda Padovan, a doctoral student at the Australian National University's Research School of Biology, says their study shows the yellowbox *Eucalyptus melliodora* is able to control which leaves are attacked by predators by alterations in its genes.
Padovan says the tree, which is estimated to be 75 years old, has developed this ability known as "genetic mosaicism" as a survival mechanism.
"If an insect outbreak occurs then a part of the plant won't be eaten and therefore it will still be able to grow and reproduce," she says.
'Cocktail of oils'
The research team collected leaves from both sides of the tree and through gene sequencing found there were 10 genes that contained differences between the leaves from each side.
Padovan says one of the main defences the eucalyptus uses against predation is its distinctive smell, which is the result of a "cocktail of terpene oils", including monoterpenes and sesquiterpenes, and formylated phloroglucinol compounds or FPCs that make animals nauseous.
The gene sequencing revealed leaves that were predation-resistant had five fewer monoterpenes and nine fewer sesquiterpenes than the leaves that were "tastier".
However the concentration of FPCs and the remaining monoterpenes was far higher.
As a result, says Padovan, the leaves on the part of the tree that was not eaten had a strong eucalyptus smell whereas the leaves that were attractive to the insects had a stronger florally smell.
Padovan says it appears the impact on vertebrates such as koalas is similar as feeding experiments in the laboratory show koalas reject the same leaves as the insects.
She says although they have searched the area nearby they have only found one yellowbox tree like this, however she suspects the trait "is more common than we know".
"Trees can't get up and walk away from unfavourable conditions and so we believe this genetic mosaicism is

a way for trees to survive changing conditions throughout their life," she says.
"We believe all trees have the ability in that they can acquire mutations in their stem cells, however we believe the mutation must be favourable - in this case the mutation led to resistance against feeding ¬- to allow an entire branch to develop."
Padovan is now using gene sequencing on an ironbark eucalyptus *Eucalyptus sideroxylon* to see if it has similar mosaic properties.

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**Eucalyptus Recipe**

Source: http://cocktails.about.com/od/mixology/r/eucalyptus_syrp.htm

Use this refreshing eucalyptus simple syrup to create great, herbal cocktails like the Eucalyptus Martini and Koala Mojito.
This recipe is courtesy of Humberto Marques of Oloroso in Edinburgh, Scotland. Marques put together a great analysis of *Herbs & Spices in the Cocktails Mixology*.

In 2013, Marques released an eucalyptus syrup as part of his The Bartist line.

Ingredients:

- 16 ounces water
- 16 ounces sugar
- 1/3 cup fresh eucalyptus

Preparation:

1. Mix sugar with water and bring to a boil.
2. Simmer for 1 minute, add eucalyptus leaves and liquidize.
3. Put in a bowl and cover in cling film for 15 minutes, then refrigerate.

The Eucalyptus Martini is the creation of Humberto Marques, mixologist at Oloroso is Edinburgh, Scotland. The eucalyptus syrup is fantastic and makes this drink with it refreshing sweetness. Marques' focus for cocktails is on fresh ingredients, and has put together, not only great drinks, but a guide to using *Herbs and Spices in the Cocktail Mixology*. I've seen two copies of this recipe, in one he uses Tanqueray 10 and in the other, Martin Miller's Gin. I used Tanqueray 10 and thought it a great pairing.

Prep Time: 3 minutes

Yield: 1 Cocktail

Ingredients:

- 50 ml (approx. 1 1/2 oz) Tanqueray 10 or Martin Miller's Gin
- 25 ml (approx. 3/4 oz) homemade eucalyptus syrup
- 12.5 ml (approx. 1/2 oz)lime juice
- 3 drops of egg white

Preparation:

1. Pour the ingredients into a cocktail shaker with ice.
2. Shake well.
3. Double strain into a martini glass.

Garnish with a floating eucalyptus leaf.

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**Abstract**

**Rainfall interception and stem flow by eucalypt street trees – The impacts of canopy density and bark type**

S.J. Livesley* ,
B. Baudinette,
D. Glover

Department of Resource Management and Geography, The University of Melbourne, 500 Yarra Boulevard, Richmond, Melbourne, Victoria 3121, Australia.

Understanding how trees influence water movement in an urban landscape is important because in an 'engineered xeriscape' small changes in rainfall frequency or magnitude have significant implications to plant water availability and mortality at one extreme, and stormwater runoff and flooding at the other. This study relates direct measures of tree canopy interception and discusses their implication for catchment hydrology in different urban landscape contexts. We measured canopy throughfall and stemflow under two eucalypt tree species in an urban street setting over a continuous five month period. *Eucalyptus nicholii* has a dense canopy and rough bark, whereas *Eucalyptus saligna* has a less-dense canopy and smooth bark. *E. nicholii*, with the greater plant area index, intercepted more of the smaller rainfall events, such that 44% of annual rainfall was intercepted as compared to 29% for the less dense *E. saligna* canopy (2010). Stemflow was less in amount and frequency for the rough barked *E. nicholii* as compared to the smooth barked *E. saligna*. However, annual estimates of stemflow to the ground surface for even the smooth barked *E. saligna* would only offset approximately 10 mm of the 200 mm intercepted by its canopy (2010).

Tree canopy and bark characteristics should be considered when planting in pervious green space, or impervious streetscapes, because of their profound impact upon tree and surrounding water availability, soil water recharge or runoff. This study provides an evidence base for tree canopy impacts upon urban catchment hydrology, and suggests that rainfall and runoff reductions of up to 20% are quite possible in impervious streetscapes. Street tree canopies can function as a cost-effective compliment to water sensitive urban design for stormwater reduction benefits.

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**Book Review**

The river red gum, more than just a tree.

Source: Listen now; Download audio; Monday 18 August 2014 11:38AM
http://www.abc.net.au/alicesprings/programs/audio.htm?&section=audio&date=%28none%29&page=3

Photo: River red Gum in the Flinders Ranges of South Australia

The river red gum is arguably Australia's best known eucalypt. It is the most widely-grown eucalypt, not just across Australia, but around the world. It grows in wetlands in the south east and along desert creeks.
CSIRO scientist, Matt Colloff, has written a book about the river red gum, titled Flooded Forest and Desert Creek. He is deeply interested in what the tree means to people and how it has been connected to settlement and to our art and culture.

'It is an incredibly adaptable, fast-growing tree,' he said. 'It can survive drought, floods, wind, insect attack. If it has access to groundwater it just goes gangbusters. It can be used for timber, fuel and woodchips.'
The tree was used by indigenous people for canoes, shields and gum, and to fuel river paddle steamers and irrigation pumps.

He argues it has also been central to tensions between economic, social and environmental values about rivers and floodplains. 'You cannot discuss the environmental effects of drought and watering along the Murray River, without discussing the River Red Gum. Its health is seen as a vital indicator of the health of the river system.'

But, despite its importance, Dr Colloff said 'we know surprisingly little about the ecology and life history of the river red gum: we don't know how long it lives; how deep its roots go; what proportion of seedlings survive to adulthood; and what organisms are associated with it.'

Matthew J. Colloff
Flooded Forest and Desert Creek
Ecology and History of the River Red Gum
CSIRO Publishing, 2014, Victoria, 325 pages

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**Abstract**

**Recruitment of *Eucalyptus strzeleckii* (Myrtaceae) in remnant patches of native vegetation in the Latrobe Valley and South Gippsland, Victoria**

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*Eucalyptus strzeleckii* K.Rule (Strzelecki gum) is a medium to tall, forest swamp gum endemic to the foothills and flats of southern Victoria. It is listed as *Vulnerable* at State (Victoria) and Federal levels. Many of the existing populations are dominated by mature, senescing trees in highly degraded habitats and recruitment of the species is rarely observed. The present study assessed the natural recruitment of Strzelecki gum at locations where mature Strzelecki gums are present and habitat degradation is not a significant limiting factor. The number of mature and recruiting Strzelecki gum individuals was assessed within gradient-oriented belt transects (gradsects) and a range of variables considered to be likely to affect recruitment were measured and correlated with the results of the recruitment study. Strzelecki gum recruits (<5 m tall) were found in 68.8% of gradsects and recruits accounted for 8–14% of the total stems counted for this species. Areas that had been recently burnt (within the past 5 years) had 15 times the number of Strzelecki gum recruits. Disturbance by flooding may also be positively associated with recruitment. Litter cover, habitat quality and density of intermediate-sized Strzelecki gums were all strong positive predictors for the density of Strzelecki gum recruits. Results from the present survey have provided a basis for land managers to estimate quantities of

mature and recruiting Strzelecki gums in large populations.

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**Abstract**

**Effect of forest fragmentation and altitude on the mating system of *Eucalyptus pauciflora* (Myrtaceae)**

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Habitat fragmentation is a key factor causing variation in important mating system parameters in plants, but its effect is variable. We studied mating system variation among 276 native trees from 37 populations of *Eucalyptus pauciflora* from Tasmania. We assayed 10 microsatellite loci from 1359 open-pollinated progeny from these trees. Across Tasmania the species' mating system was characterised by a high outcrossing rate ($t_m$ = 0.90) but moderate bi-parental inbreeding ($t_m$–$t_s$ = 0.16) and moderate correlated paternity ($r_P$ = 0.20) in comparison to other eucalypt species. Despite significant differences in outcrossing rate and correlated paternity among populations, this variation was not correlated with fragmentation. Nevertheless, fragmentation was inversely correlated with the number of germinants per gram of seed capsule content. Outcrossing rate had been reported previously to decrease with increasing altitude in mainland populations of *E. pauciflora*, but this was not the case in Tasmania. However, a small but significant decrease in correlated paternity occurred with increasing altitude and a decrease in bi-parental inbreeding with increasing altitude was evident in fragmented populations only. It is argued that strong, but incomplete self-incompatibility mechanisms may buffer the mating system from changes in population density and pollinators. While seed yields from highly fragmented populations were reduced, in most cases the seed obtained is unlikely to be more inbred than that from non-fragmented populations and, thus, is likely to be as suitable for use in local forest restoration.

**Abstract**

**Susceptibility to *Teratosphaeria nubilosa* and precocity of vegetative phase change in *Eucalyptus globulus* and *E. maidenii* (Myrtaceae)**

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Since the first report of *Teratosphaeria nubilosa* (Cooke) Crous & U.Braun in Uruguay in 2007, young plantations of *Eucalyptus globulus* Labill. and *E. maidenii* F.Muell. have been severely damaged by *Mycosphaerella* leaf disease. The genetic variation in disease resistance and in the timing of heteroblastic phase change was examined in 194 open-pollinated families of *E. globulus* and 86 families of *E. maidenii* growing in a field trial in south-eastern Uruguay, naturally infected by *T. nubilosa*. Disease severity, precocity of vegetative phase change and tree growth were assessed at 14 months. *E. globulus* was significantly more susceptible to *T. nubilosa* than was *E. maidenii*, presenting higher severity of leaf spots (10.6% and 5.6%,

respectively), higher defoliation (31.9% and 22.9%, respectively) and higher crown-damage index (39.1% and 27.4%, respectively). However, the heteroblastic transition began significantly earlier in *E. globulus* than in *E. maidenii*, with 34.1% and 2.8% of the trees having some proportion of their crown with adult foliage at 14 months, respectively. Significant individual narrow-sense heritabilities were found in *E. globulus* for severity of leaf spots (0.40), defoliation (0.24), crown-damage index (0.30) and proportion of adult foliage (0.64). Additive genetic variation in *E. maidenii* was significant only for defoliation and crown-damage index, with a moderate heritability (0.21 and 0.20, respectively). Although *E. maidenii* was more resistant to *T. nubilosa* than was *E. globulus*, the degree of resistance was not enough to consider this species as an alternative to *E. globulus* for high-risk disease sites. In addition, the small genetic variability for resistance on the juvenile foliage and the late transition to adult foliage suggested that the chances for early selection in *E. maidenii* are quite limited. By contrast, the genetic variation in *E. globulus* clearly indicated that through selection for resistance of the juvenile foliage, and especially by selecting for early phase change, it is possible to obtain genetic stock suitable for sites with high risk of *T. nubilosa* infection.

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**Eucalyptus seed available**

Christina Leiblich has kindly provided some seed (via Phil Hempil) for a unique Eucalyptus hybrid (*Euc. pimpiniana x torquata*), and I have this available for any interested members. The seed is available for those members who can send a request for this seed and please enclose a self addressed envelope. This can be posted to PO Box 456, WOLLONGONG, 2520.

Articles, requests and questions are ~~most welcomed (actually they are~~ wanted).
Please send all correspondence to my;
email address; tallowwood@hotmail.com
or postal; PO Box 456, WOLLONGONG 2520

## Membership

New members wishing to subscribe to the *Eucalyptus Study Group*, please fill out the following application and forward to Steve Harries at;
Email: abodepool@bigpond.com
Postal: No. 50 Nardoo Road, PEATS RIDGE NSW 2250

Annual membership costs are;

- $A 10 per year national members, newsletter mailed (black and white).
- $A 20 per year international members, newsletter mailed (black and white).
- $A 5 per year, national and international, newsletter emailed, full colour PDF.

All subscriptions can be mailed via a cheque (made out to the *Eucalyptus Study Group*) or payment made via direct deposit into the account listed below. For payments made via direct deposit, please add your name as reference.

Post address; Eucalyptus Study Group c/- 13 Conos Court, DONVALE, VICTORIA 3111

Bank details:
BSB No: **033-044**
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Account name: **ASAGP Euc. Study Group**

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Application for membership to the *Eucalyptus Study Group*

Date: .....

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Postal address: ..... post code.....

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