



Wombat Forestcare Newsletter

It has been a great summer for bird watching in the Wombat, chicks abound, sacred kingfishers flash their iridescent blue and families of gang gangs swoop through the trees. Insects also seem to have enjoyed the wetter conditions and the masses of butterflies and dragonflies have been extraordinary. Autumn will give us another opportunity to seek out the fabulous fungi of the Wombat. Put on your walking boots and head out to explore ... *Gayle Osborne (editor) & Angela Halpin (design)*

Stinky Fungus Makes Food for Thought

By John Walter

It was late in the afternoon in early May and I had stopped at one last spot between Trentham and Blackwood for a quick search before it became too dark for photography. As I made my way along the creek I noticed a strong unpleasant smell, quite unlike anything I had detected before and traced it to a small group of Cortinars. I quickly snapped a few photos as the light faded and headed home to review the days "catch".

In my haul were two *Mycenas* that are common in the Wombat but still a pleasure to find (see photos), a number of still unidentified *Cortinari* species, a beautiful red Waxcap that ages to black and another slimy green one that ages to yellow.

The highlight for the day however, was the stinky Cortinar, *Cortinarius perfoetens*. This species is uncommon but was easy to identify due to its furry stem and the characteristic white patches of veil stuck on the rim of the cap, not to mention the foetid smell.

What is so interesting about this find is that it apparently only grows in association with the Myrtle Beech tree, *Nothofagus cunninghamii*. This is a Gondwana rainforest species that is not currently found in the Wombat Forest. The presence of this fungus in the Wombat prompts questions as to whether the myrtle beech once grew in the prehistoric Wombat Forest and if the fungus has made the transition to other host



Clockwise from top left

Yellow-stemmed *Mycena* – *Mycena epipterygia*

Pixie's Parasol – *Mycena interrupta*

Blackening Waxcap – *Hygrocybe astatogala*

Slimy Green Waxcap – *Hygrocybe graminicolor*

Photography © John Walter

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species after the beech trees were lost to fire or some other environmental change. I am not a palaeobotanist and have no knowledge of the region's former vegetation types, but while I guess this is possible, I think the more likely answer is simply that we do not know enough about this particular fungus and its habits.

The reality is that we know very little about most macro fungi in Australia and this situation seems likely to continue for some time. This stinky fungus has previously been found in the moist gullies near Marysville and in Tasmania and in both sites *Nothofagus cunninghamii* is also growing, making the *Nothofagus* a likely candidate for a mycorrhizal relationship in the eyes of the observers. The research necessary to prove this relationship, however, has not been undertaken. Dr Tom May, of the National Herbarium in Melbourne advises that mycorrhizal relationships are also formed with Eucalypts, Acacias and Pomaderris species which in this instance makes Messmate, *Eucalyptus obliqua*, Blackwood, *Acacia melanoxylon* and Hazel Pomaderris, *Pomaderris aspera* potential candidates. I do not have details on which of these species also grows at the other sites but the Pomaderris is certainly a possibility.

The ecological importance of fungi is not widely recognised by our decision makers and there are now no fungal ecologists working for any Government agency in Australia. This is a truly ridiculous situation given that overseas ecological research has clearly established vital links between fungi and virtually all other life forms and the research that has been done in Australia is showing a strong interdependency between fungi and our forest and other native species. Pouliot and May (2010) argue that this lack of recognition is due to their being overshadowed by 'so-called "charismatic" species'. This is a funding argument where the money goes to the animal with the most public appeal rather than to the fungus which has the most impact on other life. Some work is being done by the universities and the University of Tasmania is quite active with a number of very interesting papers coming from research undertaken at the Warra long-term ecological research (LTER) site in southern Tasmania. This site is managed by a committee involving the university, Tasmanian government agencies and the forestry industry. There is insufficient space here to go into the differences in both species numbers and the species mix between old growth forests, regeneration sites and newly harvested sites; but what the research also clearly shows is the enormity of the task ahead

for taxonomical researchers. In two separate studies comparing the fungal flora in regenerating sites to that of unharvested sites, the number of named species found was around 47% of the total. (Gates *et al.* 2005 and Gates *et al.* 2009) One of the authors of these reports is Dr Genevieve Gates who in her Doctoral thesis, recorded 849 species of macro fungi in a one hectare *Eucalyptus obliqua* dominated site over a 14 month period. Only 33% of these were named and 50% were species completely unknown to her. It should be noted here that there are a great many more species of micro fungi than macro fungi with some estimates placing this as high as 20 to 1. This makes the fungal diversity of a single hectare truly astounding. (Gates 2009)

Recent estimates indicate there are 10,000 species of macro fungi in Australia but only half of them have been collected and recorded (and not all of these have been officially named yet). This leaves around 5000 completely unknowns out there waiting for some enthusiastic amateur to stumble across, recognise as new, and forward details to the herbarium. Once in the herbarium it could be decades before the taxonomical work is completed and the 'find' gets a name. There are



Cortinarius perfoetens – note the purple tones where the stem meets the gills. Photography © John Walter

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around 10 researchers doing taxonomical work on fungi in Australia, none of them are full time and many are former herbarium staff, now retired.

The publication of the Fungi of Australia volumes is an important exercise that will at least place comprehensive descriptions of the known species into the public arena but this will take a great many years to complete. Its early focus has been on the micro fungi which includes the rusts, moulds and mildews and there appears to be more funding available for ecological research in this area due to the impact these fungi groups have on our food crops and their use in food production. One volume of macro fungi has been produced and this covers the family Hygrophoraceae which includes the genus *Hygrocybe* featured earlier. This is a very colourful group of fungi and they are well represented in the Wombat Forest. Other serious publications include one on the *Mycenaceae* of South-eastern Australia and a preliminary work on the *Boletes* of Australia which I found in a UK-based book store but have never seen offered for sale in Australia.

Let's return to the little stinky Cortinar that got me started on this exercise. Its presence in the Wombat confirms that it is not mycorrhizal with *Nothofagus* as previously thought. My reading of Gates' thesis and discussion with Tom May causes me to place the *Pomaderris* on the top of the suspect list and now I am wondering what other species might I find in association with the humble Hazel *Pomaderris*. How do we package up a small brown smelly fungus and sell it to the funders as a charismatic species so the research necessary to learn the importance of this species is undertaken? What do we do about the 203 unnamed species of *Cortinarius* found by Gates in her 1 hectare old growth plot?

While I understand the charisma argument, I have also seen the look in the eyes of everyday Australians when they see a beautiful fungus image, or see the startling colour of the gills on *Dermocybe splendida* (a Cortinar by another name) for the first time. Fungi ARE charismatic

to me and I hope also to you, we need to keep placing them before the public and arguing their right to equal funding and protection along with the fauna and flora.

Please note that while this Cortinar provided food for thought, Cortinars in general do not provide food for the body. In fact, some of them are downright deadly! I do love the look of the furry white sock on the stem of our stinky friend however. ■



Above - *Dermocybe splendida*,
Middle - *Cortinarius archeri*,
Below - *Dermocybe canaria*.
Photography © John Walter

References

Fuhrer, B. (2009) A field guide to Australian fungi 2nd Ed. *Cortinarius perfoetens* listed as *Rozites foetens*

Pouliot, A. & May, T. (2010) The third 'F' – fungi in Australian biodiversity conservation: actions, issues and initiatives – in *Mycologia Balcanica* 7: 41-48

Gates, G.M., Ratkowsky, D.A. & Grove, S.J. (2005) A comparison of macrofungi in young silviculture regeneration and mature forest at the Warra LTER site in the southern forests of Tasmania.

Gates, G.M., Ratkowsky, D.A. & Grove, S.J. (2009) Aggregated retention and macrofungi: a case study from the Warra LTER site, Tasmania.

Gates, G.M. (2009) Coarse woody debris, macrofungal assemblages and sustainable forest management in a *Eucalyptus obliqua* forest of southern Tasmania – thesis submitted in fulfilment of the requirements for the Degree of Doctor of Philosophy.

Ecosystems and other jargon

By Miriam Rotstein

Do you ever come away from a nature talk generally inspired but vague on the details, maybe even a little bamboozled? Scientific words can make it hard to keep track of a talk but what they mean is simple. All you need is a good explanation!

'Ecosystem' is one of these words. It may conjure up a vague picture of wilderness and birdsong – this is a great start! It just needs expanding. An ecosystem is often referred to by its environment type (e.g. forest or grassland ecosystem), but it also includes the plants, animals and fungi (the **'community'**). They are dependent on each other for their future survival - so an ecosystem is an area that has a relatively contained cycle of life happening within it.

To keep the big cycle of life happening there are lots of jobs (or **'processes'**) that need to get done. Each species in the ecosystem has a role. When there are more species in an area it is more likely that there will be someone to do each of these necessary jobs, such as keeping insect numbers in check or breaking down and recycling plant material. You can count the **'species richness'**, and use this as an indicator of **'ecosystem health'**: you can look at the total number of species present or just at the diversity within a specific group like birds or aquatic macroinvertebrates.

In an ecosystem everyone must find food (the **'food web'**); it starts with plants growing by photosynthesis. As everyone munches away nutrients and energy are being cycled and recycled through the food web.

The water cycle is another important process, especially in our region. The Wombat Forest and surrounding area plays a special role in the water cycle as it contains the headwaters of six rivers and is a recharge point for groundwater. This is why the region has so many springs - so you see the composition and position in the landscape is also important.

An ecosystem should provide habitat for all its occupants. Unfortunately due to the extensive logging

and mining in the Wombat Forest during the 1800s and further logging in the late 1900s even the oldest parts of the Wombat are mostly only about 100 years old. This is about how long it takes significant tree hollows to form which many birds, mammals and reptiles depend on for shelter and breeding.

The rich soils surrounding the Wombat have been cleared for agriculture leaving the remaining forest mainly on infertile soils which means that the forest has reduced **'productivity'**: one impact of this is that the flowering of eucalypts produces less nectar and leaves are less nutritious and the overall effect is that fewer animals can be supported.



Varied Dusky-blue Butterfly, *Candalides hyacinthina* on Dodder-laurel vines.
Photography © Gayle Osborne

Some ecosystem functions can be small and unexpected: when potoroos feed, they dig small conical holes to find grubs and fungi. These holes then collect water, seeds and leaf litter: a perfect place for seeds to germinate.

'Parasitism' is a naturally occurring interaction of species; dodder-laurels parasite a number of plants and provide fruit for birds. The caterpillars of two butterfly species rely solely on their foliage. However, the impact of mange on wombats, brought in with foxes, has been devastating as they have not evolved ways to deal with this parasite.

Ecosystems are not static and have constantly faced **'disturbances'** such as drought or wildfire. Ecosystems have varying degrees of **'resilience'** where they can **'bounce back'** to a **'normal'** state of functioning. For example, when a 40 year old pine plantation within the Wombat Forest was harvested several years ago and the site was burnt to remove the waste, within a few months nearly 30 local species had regenerated, the seed having lain dormant for those 40 years. Many of these species were not evident in the surrounding forest.

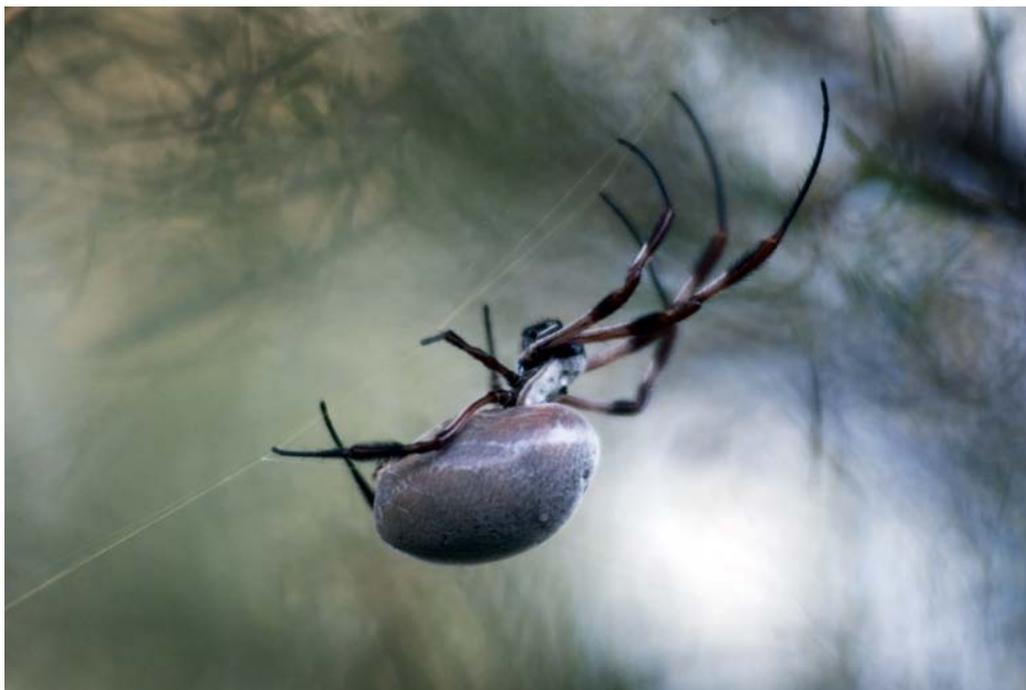
More research is needed into the **'ecosystem functions'** of the Wombat Forest, especially as it is home to a number of endangered and vulnerable species including the Powerful and Masked Owls, Brush-tailed Phascogales, and is possibly even still home to Spot-tailed Quolls. ■

The way into my parlour is up a winding stair*

- The Wombat's wondrous weavers

By Alison Pouliot

There's nothing quite like the shock of wandering face-first into a golden orb weaving spider's web while out on a Wombat Forest stroll. However, you're more likely to die from fright than bite, as Orbs prefer an insectivorous diet with the occasional bird or bat for dessert.



Golden orb weaving spider (*Nephila* sp.)
Photography © Alison Pouliot

Orbs belong to the Family Nephilidae and are some of the largest spiders you'll encounter in the Wombat, indeed the country. Nephilidae is also one of the most ancient spider families, believed to have been spinning about the globe for the last 165 million years. Australia's impressive swag of toxic spiders hasn't exactly bolstered their charisma status. But rest assured that Orb family members are generally non-toxic to humans, reluctant to bite and usually cause only negligible symptoms if they do.

Highly-skilled weavers

Spider webs have miraculous qualities that intrigue and delight, with Orbs being arguably the most supreme of the arachnid architects. The generic name, *Nephila*, means 'love of spinning' and indeed Orbs spin exquisitely beautiful and complex webs.

They're known as golden orb weavers due to the golden sheen of their webs when sunlit. Special compounds contribute to the yellow colouration that lures insects to the sunlit strands. When shaded the webs are craftily camouflaged. Their suspended sticky wheel-shaped orbs span large distances between trees

and shrubs, guilefully positioned in the flight paths of their prey. If you're really lucky you'll see them en masse, in spectacular congregations of overlapping webs. However, if you venture too near the spider may perceive you as a predator and with impressive reflexes madly shake her web in warning.

Orb spiders' webs may appear haphazard but in fact they're a complex of a fine-meshed orb carefully suspended on a network of sticky barrier webs.

The female first builds a kind of a coarsely woven scaffold of spirals and then backfills with smaller spirals in between. An outer barrier web of 'guard-strands' is often adorned with the discarded remnants of insect carcasses or plant detritus that act as a deterrent to potential predators. Webs are pretty much under constant renovation, with new spirals spun as required, either when strands are damaged or lose their stickiness. Orbs also alter the web structure in wet or windy weather, dismantling sections to lessen the impact of destructive winds.

Dangerous liaisons

The female Orb is recognisable by her large leaden grey abdomen, usually with a fine covering of silvery hairs and striking yellow-banded legs. She mostly sits centrally in her web, head pointing downwards. If you look carefully you may spy a tiny (≈ 5 mm) red-brown coloured spider lurking cautiously along the web's outskirts. That's the male, keeping a safe distance. Or

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Golden orb weaving spider (*Nephila* sp.)
Photography © Alison Pouliot

you may even see a harem of males. Mating usually takes place in late summer-autumn and males must stealthily ensure that females are distracted during their liaison, as her cannibalistic tendencies could seriously foil his love making efforts. Orbs are curious not only for their extreme sexual size dimorphism (female

Motion-sensing Camera Projects

New technology has increased our ability to collect fauna data. Motion-sensing cameras allow us to see wildlife moving at night. It all sounds fantastic, however these cameras can only provide a small snapshot of fauna activity. Male Brush-tailed Phascogales (*Phascogale tapoatafa*) have a home range of about 100 hectares. Would one be in the vicinity of the camera during the few weeks it is on site?

Two projects using motion-sensing cameras in the Wombat Forest are in the planning stages and present

gigantism), but apparently they also engage in peculiar sexual repertoires including enigmatic behaviours such as self-castration, genital mutilation and mate plugging. The female is 'plugged' when the male's pedipalps break off inside the female's copulatory opening after copulation. The pedipalps effectively serve as a plug to prevent further males mating with the female. If you're interested to know more about these fascinating modes of sexual selection see Kuntner (2009).

After mating the female spins a single egg sac which may contain up to a thousand eggs from which the tiny spiderlings will emerge about a month later. They disperse by ballooning in spring – a form of mechanical kiting where they alight on a wind updraft on a fine gossamer thread. A lovely way to travel indeed!

You may also spot some other arachnid inhabitants in the orb spider's web known as kleptoparasitic spiders. Kleptoparasites benefit from the web by stealing prey, usually smaller insects. While considered parasitic there is also a mutual benefit to the orb spider as these handy housekeepers keep the webs spick-and-span and free of debris.

So next time you're wandering about the Wombat and encounter a golden orb weaving spider, take a moment to observe her fascinating activities. You never know, you may even be treated to a perilous yet steamy rendezvous. ■ www.alisonpouliot.com

* From the poem, 'The Spider and the Fly', Mary Howitt (1799-1888)

Kuntner S., Kralj-Fiser, S., Schneider, J. M. & Li, D. (2009) Mate plugging via genital mutilation in nephilid spiders: an evolutionary hypothesis. *Journal of Zoology* 277: 257–266

a great opportunity for community members to be involved. Wombat Forestcare has partnered with the VNPA NatureWatch program to survey for fauna with the aim of providing data for their Fauna and Fire project. The project is supported by the Arthur Rylah Institute for Environmental Research (DSE).

An information and training day will be held at Trentham on Saturday 10 March. For details contact Caitlin Griffith caitling@vnpa.org.au or telephone 93416510 (Thursdays and Fridays).

WFC also has three cameras (two purchased with a grant from Hepburn Wind) which will be used in a separate project.

Meet the Neighbours

Words and images by Gayle Osborne

If you are lucky enough to live amongst native vegetation it is worth exploring with a magnifying glass. No need to stray far from the house. A camera with a macro lens is a very exciting tool, especially combined with the computer.

The insect world is pure science fiction, Star Wars characters come to mind; and most of these amazing creatures are dependant on native vegetation and some totally dependant on very specific plants.



Dragonflies evolved long before the dinosaurs. As probably the fastest of the flying insects, they can also zigzag, hover and fly backwards as well as having fantastic eye-sight making them formidable hunters of large numbers of insects including mosquitoes.



The Long Nosed Weevil, *Rhinotia hemistictus* is only 20mm long and is feeding on the stem of a Silver Wattle, *Acacia dealbata*. This beetle has an elongated snout with a mouthpiece (rostrum) to feed by boring along the stem. He raises himself on fabulous legs and strongly grips the branch.



The wonderfully grotesque caterpillar of the Wattle Moth, *Neola semiaurata* was also found feeding on a Silver Wattle. This is an early development stage (instar) of the caterpillar which will drop into the leaf litter to pupate in a cocoon.

The rear end is a pseudo head with a red tipped lance which the caterpillar raises when disturbed. There are fake blue eyes in the tail; one is just visible under the raised tail.



Crane flies have slender bodies, long wings and very long legs. There are 704 species in Australia and are often mistaken mosquitoes. Their larvae are found in fresh water, damp soil or rotting plants.

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Meet the Neighbours

In excess of 86,000 species of insects have been identified in Australia, however many, many more are yet to be identified. The CSIRO believes that we have approximately 220,000 different insect species.



1. Caterpillar with attendant ants



2. Pupa with attendant ants



3. Imperial Hairstreak butterfly

The Imperial Hairstreak caterpillar, *Jalmenus evagoras* emerges from eggs laid on the stems of Acacia species. The female only chooses medium sized young trees and in this case Silver Wattle, *Acacia dealbata*. The caterpillars are attended by ants (always of the Iridomyrmex family), providing a nutritious secretion in return for protection from predators.



This moth emerging from its cocoon, has an exquisite wing pattern and is probably a female Swift Moth, *Abantiades labyrinthicus*. The caterpillars of this species are thought to feed on tree roots, and pupate in the bottom of a tunnel in the soil.



Watching this furry caterpillar to see how he would cocoon, I thought the white fluff was interesting. A bit of research revealed that the larva (caterpillar) had been 'parasited' by a wasp. The wasp maggots hatch from eggs, eat out the larva, emerge and spin white cocoons amongst the hairs. They then emerge as adults.

Wombat Forestcare Membership

Wombat Forestcare Inc. is dedicated to preserving the biodiversity and amenity of the Wombat State Forest by utilising the skills and resources of the community. By becoming a member you will have input into our activities and projects, and give support to caring for our forests.

For memberships and further information contact Gayle Osborne, phone 03 5348 7558 or email info@wombatforestcare.org.au
Membership fees are only \$10 single and \$15 family.

Visit our website - www.wombatforestcare.org.au