THE QUEENSLAND MYCOLOGIST

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The Queensland Mycological Society

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Internet: http://qldfungi.org.au/

Email: info@qldfungi.org.au

Address: PO Box 5305, Alexandra Hills, Qld 4161, Australia

Society Objectives

The objectives of the Queensland Mycological Society are to:

1. Provide a forum and a network for amateur and professional mycologists to share their common interest in macro-fungi;

2. Stimulate and support the study and research of Queensland macro-fungi through the collection, storage, analysis and dissemination of information about fungi through workshops and fungal forays;

3. Promote, at both the state and federal levels, the identification of Queensland's macrofungal biodiversity through documentation and publication of its macro-fungi;

4. Promote an understanding and appreciation of the roles macro-fungal biodiversity plays in the health of Queensland ecosystems; and

5. Promote the conservation of indigenous macro-fungi and their relevant ecosystems.

Queensland Mycologist

The *Queensland Mycologist* is issued quarterly. Members are invited to submit short articles or photos to the editor for publication. Material can be in any word processor format, but not PDF. The deadline for contributions for the next issue is **30 August 2015**, but earlier submission is appreciated. Late submissions may be held over to the next edition, depending on space, the amount of editing required, and how much time the editor has. Photos should be submitted separately at full-size to allow flexibility in resizing and cropping to fit the space available while minimising loss of quality. Authors who have specific preferences regarding placement of photos should indicate in the text where they want them, bearing in mind that space and formatting limitations may mean that it is not always be possible to comply. Material from published sources may be included if that complies with copyright laws and the author and source are properly acknowledged.

Membership

Membership of QMS is $25 per annum, due at the beginning of each calendar year, and is open to anyone with an interest in Queensland fungi. Membership is **not** restricted to people living in Queensland. Membership forms are available on the website, http://qldfungi.org.au/.

Could members please notify the membership secretary (memsec@qldfungi.org.au) of changes to their contact details, especially e-mail addresses.

Cover photo: Adrian Harris took this photo of what was at the time thought to be *Fistulina hepatica* on the Linda Garrett foray in June. However, it is not that at all. Some sleuthing by Patrick has shown that it is another species, *Fistulina spiculifera.* See pages 8-10.

QMS Executive

President
Frances Guard
07 5494 3951
info@qldfungi.org.au

Vice President
Patrick Leonard
07 5456 4135
patbrenda.leonard@bigpond.com

Secretary
Ronda Warhurst
info@qldfungi.org.au

Treasurer
Wayne Boatwright

Minutes Secretary
Ronda Warhurst

Membership Secretary
Wayne Boatwright
memsec@qldfungi.org.au

Foray Coordinator
Frances Guard
info@qldfungi.org.au

Committee Member
Dave Wood

Other office holders

Collection Permit Holder
Patrick Leonard

Website Coordinators
Dave Wood
Vanessa Ryan
webmaster@qldfungi.org.au

Librarian
Jean-Cesar Puechmarin

Newsletter Editor
David Holdom
david.holdom@iinet.net.au

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QMS Activities

Meetings

Meetings are held in the F.M. Bailey Room at the Queensland Herbarium, Mt Coot-tha, commencing at 7pm on the second Tuesday of the month from February (no January meeting), unless otherwise scheduled. Check the website for details and any changes. There will be 3-4 guest speakers invited during the year and other meetings will be informal. Suggestions from members for topics or names of potential speakers or talks will be welcome at any time. Please contact a member of the Executive.

To assist those unable to attend meetings, notes on the talks are included in the Queensland Mycologist wherever possible. However, the notes never do justice to the topic as they do not reflect the enthusiasm of the speaker or cover the discussion that follows. So remember, where possible it is better to attend the meetings, get the information first hand and participate in the invaluable information sharing opportunity.

Suppers are provided by volunteers. Check the website for details of the roster and if you are able to assist please contact the Secretary.

Forays

QMS hold regular forays during the first half of the year. The dates are nominally the 4th Saturday of the month, but actual dates may vary and additional forays may also be held.

Field trip details may change as a result of drought or other unforeseen circumstances. Check the website for changes.

Members are invited to suggest venues for additional forays. If you have any suggestions (and especially if you are willing to lead a foray), please contact Fran or another member of the Executive.

Workshops

QMS runs workshops in the second half of the year, when there is little field activity.

The first workshop for 2015 will be on **Spore Prints and Pics**, scheduled for the 29th of August.

A second workshop is planned for later in the year, most likely in October, but the topic has yet to be confirmed. **How to ID Small Brown Fungi** or a **Beginners Workshop** have been suggested as possible topics, but more ideas from members will be welcome.

Send your ideas to Fran or Ronda (info@qldfungi.org.au**).**

Details will be included in future newsletters and on the QMS website.

QMS Calendar 2015

MONTH	MEETINGS	FORAYS/WORKSHOPS
August	11th Bring your microscope evening. Diana Leemon will be there to give advice on microscope setup & maintenance Foray report: Murrumba Downs	29th Workshop: Spore Prints and Pics Location: Uniting Church Hall, 1284-1290 Landsborough-Maleny Rd, Maleny Leader: Fran Guard Cost: $5
September	8th Sapphire McMullan-Fisher: *Fungi Allsorts*	-------
October	13th Members' evening	Date and topic to be announced
November	10th Workshop report. Members talks on items of interest (see website)	------
December	8th Christmas Party. Our 10th anniversary! More on that in the next newsletter	Christmas Break

Editor's Comments

The second newsletter for the year is late, as I was away in June. Hopefully you will agree it was worth the wait.

Vanessa reports on the foray to one of her favourite places, Girraween. Patrick's report on the Linda Garrett foray follows, along with a note on identification of the spectacular red bracket featured on the front page. Initially it was thought to be *Fistulina hepatica*, but there were some doubts, and Pat's sleuthing has now corrected the record. It turns out to be *Fistulina spiculifera*, which has not previously been identified in Queensland.

So many Queensland fungi are not yet described, were poorly described many years ago, or given a European or North American name. The advent of DNA analysis has potential to rectify these problems, but too few resources are allocated to it in Australia, so it will take a long time at the present rate of progress. The QMS aims to encourage members to properly identify fungi collected on forays, as far as they can. The best place to start is with a published Australian key (if one exists), using a microscope where necessary. Keys are seldom complete though, and ideally the identification should be confirmed with a properly published description. Those descriptions can be hard to obtain, so even after all that work, identifications can remain provisional. And sometimes your fungus will not have been described.

If you don't feel confident using a microscope, come to the August meeting where Diana will help you get the best out of your microscope, and attend the August 29 workshop to find out how examining fungal spores can help in identification.

Identifications on a foray are at best a draft; that is why we call them 'field identifications'. Those in foray reports and in the Queensland Mycologist have been checked a bit more thoroughly, but can still be wrong. If we cannot give a collection a firm name then it has been the practice to write it up, give it a tag name and put it in the Fungi of Queensland section of our website. That way we will be able to match it if we find it again and maybe one day we will get one or two more taxonomists to work these up for publication.

Megan has reported on a Brisbane West Fungi Survey from 2014, which was part of a BCC-funded project that was completed this year. That project provides a good illustration of the value of community engagement, and had the unplanned spin-off of the development of the SEQ Fungi Facebook Group. I confess to being very backward when it comes to social media, but applaud those who set up this group.

We then move to South Australia where Fran reports on 12 years' of involvement on a Birds Australia reserve in the mallee country. Finally, there is a short note from Glenda Walter on a fungus beetle.

Notes from Patrick's talk on his New Caledonia expedition will appear in the next Queensland Mycologist, due in September. I need more material for that edition, so would those of you with other reports and articles in the pipeline please get them to me by the end of August.

Now that the foray season is over, it is time to turn our minds to workshops. The first workshop is scheduled for August 29 (see the QMS Calendar above). A second is planned for later, most likely in October. ***How to ID Small Brown Fungi*** or a ***Beginners Workshop*** have been suggested as possible topics, but more ideas from members are welcome. See page 3.

Finally, many thanks to Nigel, Fran, Megan, Patrick, Susan and Vanessa for your sterling efforts in proof reading. You have made the newsletter much better than it otherwise would have been, and saved me from a lot of embarrassment. And of course many thanks to the authors who worked so hard on the articles.

Girraween Foray 11th April, 2015

Vanessa Ryan

A QMS foray in Girraween National Park had been tentatively planned for April this year. Its going ahead was dependent upon the chance of rain, so when good rain did fall in the area, the foray leaders decided, at short notice, to cancel the planned visit to Cunningham's Gap and go to Girraween that Saturday instead.

Girraween is situated about halfway between Stanthorpe and Tenterfield, right on the border of Queensland and New South Wales, and about three hours drive from Brisbane. This distance is the reason why the organisers chose to make the outing a two day event. A second foray was held at another location near Stanthorpe on the Sunday - Wilson's Downfall.

Girraween has two camping areas, but our forayers chose to either stay overnight at local motels or take advantage of the kind invitation to stay at Ronda and Peter Warhurst's home in Warwick. Some people just came for the day trip on the Saturday and didn't stay for the second foray on the Sunday.

Ten people attended the Girraween part of the weekend – 8 of whom were QMS members. The foray went for about 2½ hours and ended not long after we had lunch.

Girraween is quite different from many of the regular QMS foray sites. Its climate is usually fairly dry. In summer, temperatures can get to 40°C, while in winter it sometimes gets cold enough for light snow to fall. As it is located on the Granite Belt, it has a rocky terrain with poor, acidic soils. There is a variety of habitats – including swamps, heaths, grassy paddocks and eucalypt forests. A lot of the park's landscape is pristine, but some of it is reclaimed farmland that is slowly being rehabilitated by the park rangers with re-vegetation programs. Many of the native plant and animal species that live there are quite different from those found in coastal areas.

In October last year about 3,000 hectares - which is roughly a quarter of the park's total area - was burned out in a bushfire. The place we chose to foray in had been at the southern edge of the fire zone. The soil was still littered with bits of charcoal and many of the trees had blackened bark at their bases. Most of the lower story plants were regrowing and were well on their way to recovery.

The location of the foray was just north of the Underground Creek track, where the QMS's 2011 foray had been held. We started in a grassy paddock and worked our way down a slope into open dry forest. At the bottom of the slope was a marshy strip that was a creek channel.

22 fungi were collected - 16 were agarics, 2 were boletes and 2 were puffballs. The other 2 were a leather and a polypore. So far 6 of the collections have been identified to species, 4 of which are possibly new to the list I've been putting together for the park. 10 have been identified to genus. Of these, one fungus has since gone mouldy and had to be thrown out. The remaining 6 collections are still to be worked on. A detailed list of the collected specimens is available from the QMS website on the Foray Reports page:

http://qldfungi.org.au/resources-2/foray-reports

As some of you might know, I have a special interest in Girraween and my husband, Chris, and I try to visit the park a couple of times every year. Before we had known there was going to be the QMS foray there, we'd already organised to visit the park that same weekend. So, after the other forayers had left for the afternoon, Chris and I went back to the main picnic area and I went for a walk along the creek and looked for more fungi. On Sunday morning, instead of going to Wilson's Downfall with the others, we returned to Girraween and did a short foray on the southern side.

Chris and I collected 13 more fungi – 6 agarics, 2 boletes, 2 corals, an earthball, a polypore and a puffball.

Here are some of the more interesting fungi that were found in Girraween that weekend …

Boletus sp. © Megan Prance

This is a *Boletus* of some sort, but we don't have a name for it yet. The cap's upper surface was a smooth, pinkish-brown colour with streaks of red. Its stunning golden-yellow pores instantly turned a strong blue when bruised. Its lemon-yellow stipe was moderately reticulated and also bruised blue, and the flesh turned blue on cutting.

Austroboletus sp. © Pat Leonard

This was the find of the foray. I knew that something wonderful had been discovered from the chorus of loud “oohs” and “aaaahs” people made when they first approached it. This bolete was quite big and it was also in near perfect condition. From the deeply reticulated stipe, it is a species of *Austroboletus*. The cap was a beautiful golden brown colour, the surface texture like suede and the pores were a very, very pale pink. The top of the stipe was mostly white, becoming golden yellow at the base.

Phellinus sp. © Peter Warhurst

The polypore of the day was tentatively identified as an *Inonotus* species, but Nigel thinks it is more likely to be a *Phellinus* . It was growing at the base of the trunk and on some exposed roots of a large *Eucalyptus* that had been scorched by the bushfire. Even though it was quite large and tough, it was surprisingly very light in weight. The pores underneath appeared, from some viewing angles, to be greyish in colour and brownish on others. The spores are supposed to be brown, so that is probably why. I have previously found the same species in another part of the park. It was also growing at the base of a burned tree.

Lichenomphalia umbellifera © Vanessa Ryan

There are two species of *Lichenomphalia* known to be in Australia and both of them have been found in Girraween. *Lichenomphalia umbellifera* is a brownish gold colour, with an upturned margin, while the other species, *Lichenomphalia chromacea*, is a bright, clear yellow and has a downturned margin.

Lactarius eucalypti © Peter Warhurst

Even though it is quite a common fungus in Queensland, this is the first record that I know of it being found in Girraween, where it was growing at the bottom of a slope, in a damp creek bed.

Podoscypha sp.© Adrian Harris

The blackened one on the left looks as if it went through the bushfire. I've found *Podoscypha* in other places in the park and all were growing in previously burned areas.

Pisolithus albus ©Vanessa Ryan

On the way in to Girraween, a few of us noticed an almost unbroken line of these fungi growing along the side of the road. The line went for about 3kms.

Ramaria sp. (*samuelsii*?) © Vanessa Ryan

If it is this species, then it is the first record of it being in Queensland. I found it growing in two different areas in the park.

(Left) © Vanessa Ryan

I thought this unidentified polypore might be an *Aurantiporus*, but the only species known from Queensalnd, *A. pulcherrimus,* is bright red and associated with *Nothofagus*, so it is not that. The upper surface was white with golden brown margin, pores pale yellow, and it oozed a golden "tea". It had a very soft texture, bruised easily a dark cinnamon-brown, and had a white spore print. So until further work can be done on it, the identity of this one remains a mystery.

Linda Garrett Foray June 2015

Patrick Leonard

Fungi are fun - © John van de Geyn

By chance our foray to Linda Garrett Reserve this year took place on almost exactly the same day in June as it had in 2014, but what we saw and collected was surprisingly different. We saw 67 different fungi this year against only 46 last year, with recent rain and a warm autumn seeming to account for some of the differences. As had happened last year, only a quarter of the fungi had been seen more than once on previous forays. There seems to be a core of relatively common fungi at Linda Garrett that can be relied upon to come up every year. But there are always new and surprising species.

Because we visit this site regularly we have over the years got slightly better at identifying the fungi we find. The proportion identified to species level was 68% this year; up from 56% last year. Thanks to those members who took fungi home and worked them through keys.

Linda Garrett seems to be a very good place for toothed fungi. Members will recall a previous find of a blue grey fungus tag-named *Sarcodon* 'griseoviolaceum'. This year we added *Hydnellum auratile* to the list. This group of fungi seldom seem to be common and elsewhere in the world some are decidedly rare. What seems to be unusual about the Linda Garrett Reserve is that it has a range of these species (see table below).

Whilst toothed fungi were in evidence, this was the first year in which we found no Boletes at all, possibly because they prefer slightly drier conditions.

Few *Cortinarius* are ever identified to species level in Queensland, but on this foray we managed three: *Cortinarius subcalyptrosporus* is a stunning violet purple species first described from North Borneo (Malaysia) and also known from New Zealand. If confirmed, this will be the first Australian record of this fungus.

Hydnellum auratile © Fran Guard

Hydnoid fungal data from: BRI, the Atlas of Living Australia and QMS records.

Name	Linda Garrett	QLD cols	Aus cols
Hydnum repandum	3	9	103
Hydnellum aurantiacum	0	1	0
Hydnellum auratile	1	1	5
Phellodon plicatilis	1	0	16
Phellodon niger	1	1	618
Phellodon maliensis	1	1	9
Sarcodon 'griseoviolaceum'	1	1	0

Cortinarius rotundisporus is a more common fungus with a steel blue-grey cap and unusual rounded spores that we have found at Linda Garrett before. *Cortinarius subarvinaceus* has been collected once before in Queensland and there are a number of very old records of this fungus in South Australia, but it is not common. It has typical *Dermocybe* type bright red gills.

Three *Laccaria* species were found, difficult to separate in the field, but distinct under a microscope. They are separated by their basidia (two- or four-spored) and the spore ornamentation.

Ramaria botrytoides and *Ramariopsis crocea* were both found in good condition.

Cortinarius subcalyptrosporus ©John van de Geyn

Cortinarius subarvinaceus © John van de Geyn

Ramaria botrytoides © John van de Geyn

Identifying polypores remains a problem. There do not seem to be workable keys to either *Phellinus* or *Inonotus* and we find members of both genera on every visit to this reserve. Last year we found a bright red polypore which we recorded as *Fistulina hepatica*. Thanks to some good photographs (from Adrian Harris) of young specimens this year there was some doubt about whether the previous ID was valid. Examination of the literature led to the conclusion that this species is in fact *Fistulina spiculifera,* as explained below.

Recognizing a red bracket fungus

A ramble through the messy literature on Queensland polypores

Patrick Leonard

Bracket fungi grow on wood and form shelf like fruiting bodies where the sporulating surface is usually parallel to the ground. Many grow on fallen branches, a few like *Phaeolus*, *Bondarzewia* and some *Ganoderma* fruit from roots (though not necessarily exclusively), and a few others produce fruit bodies on living or dead standing tree trunks. We all tend to use this information about where the fungus is growing as a first step to finding out what the fungus is.

Bright colours are also used as a filter, so, for example, bright red brackets attached to small or medium sized branches of dead wood are often noted as *Pycnoporus*. Red polypores growing at eye level on the trunks of living trees are few in number. So, when QMS members found such a fungus on the Linda Garrett foray in June 2014, two options were considered:

- *Aurantiporus pulcherrimus*
- *Fistulina hepatica*

Both had been recorded previously in Queensland in the Lamington National Park, the *Aurantiporus* records (3) were all from *Nothofagus moorei* trees and it is reported from elsewhere in southern Australia on a *Nothofagus* host. The *Fistulina* was reported from *Eucalyptus*. The Linda Garrett bracket was growing on a tree which was later identified as *Syncarpia glomulifera*. The colour of the specimen was a very vivid blueish red, its lower surface was also red and this did not fit either possibility. No other red brackets growing on standing tree trunks were known. On balance, and with some hesitation, this fungus was recorded as *Fistulina hepatica*. None of us noticed an interesting entry half way down page 256 of Ian Hood's Introduction to Fungi on Wood in Queensland (Hood 2003) on a page devoted to

Pseudofavolus miquelii. If we had, that might have led us to a more accurate identification.

A year went by and on the Linda Garrett foray in June 2015 Adrian Harris took some very good close up photos of a bright red fungus growing on the same *Syncarpia* tree. This clearly showed some rather odd pointy granulations on the upper surface, not quite squamules, these granulations were not known to be a character of *Fistulina hepatica*. So, when it was reported to the QMS meeting in July, I did, in fact, make mention at the meeting of the fact that there are other *Fistulina* species around and that it may be one of them, but couldn't provide any specific epithets.

Fistulina spiculifera © Adrian Harris

Later that week, in search of a description for another bracket, *Aurificaria indica*, which had got on to the long list of candidates for a Queensland Red List, I searched out a copy of Derek Reid's 'New or Interesting Records of Australian Basidiomycetes: V' (1963). The next species that Reid dealt with after the *Aurificaria* was a *Fistulina* (as a *Polyporus)* described by Mordecai Cooke in 1892. Reading on, the cap was described as 'very dark brown to blackish' and I almost gave up at that point. But the end of the same sentence said 'and covered with short, scattered 'spicules' which are especially abundant near the margin'. Cooke painted this fungus from a dried specimen. His illustration shows an almost black polypore but you can clearly see the pointy granulations on the cap.

The next step was to see whether anyone else had found this fungus more recently and to my delight I discovered that the Department of Environment and Conservation in Western Australia had published Fungus factsheet 33 in 2009 with a picture and description prepared by Richard Robinson that exactly fitted our find. It also showed an old specimen which was dark brown as in Cooke's description. A good illustration of the real *Fistulina hepatica* can be seen on page 251 of Bruce Fuhrer's (1990) field guide.

So we now know that we have *Fistulina spiculifera*

Cooke's illustration of *Fistulina spiculifera* (labelled '55')

in Queensland and that a 'spicule' is an old word used for a sterigma, the pointy bit that holds the spore at the top of a basidium. (Nigel noted that another definition is "any of various small needle-like anatomical structures occurring in organisms"-ed).

This ramble amongst the literature on Queensland polypores ended happily. Far too many end with the feeling that one has when lost in a deep and impenetrable patch of bush.

References:

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Fuhrer B. (2009). *A Field Guide to Australian Fungi*. Bloomings Books, Melbourne.

Hood, I. (2003) *An Introduction to Fungi on Wood in Queensland*. University of New England Press, Armidale, New South Wales.

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Brisbane West Fungi Survey Report 2014

Megan Prance

In 2013 a project named "Finding and Identifying the Fungi of Brisbane West" was funded by Brisbane City Council's Lord Mayor's Environmental Grants Program 2013/14. The project aimed to:

- Engage the community to find and identify the fungi of the Wolston and Centenary Catchment area of Brisbane West;
- Educate the community about fungi and the web of life by promoting an understanding of the inter-relatedness of plants, animals and fungi for a healthy bio-diverse environment, and
- Address the lack of knowledge about the fungi species present in Brisbane West.

The project was completed in 2015.

The Brisbane West study area was delimited by the Brisbane River to the West, from Blunder Road to the Logan Motorway and Oxley Road to Indooroopilly Bridge to the East, but also extending to Oxley Creek. The southern boundary was the Logan Motorway and Wolston Park Golf Club. The Wolston and Centenary Catchments are contained within this area. See appendix for map. The study area of approximately 100 square kilometres includes a range of habitats such as dry rainforest remnants, eucalypt woodlands, grasslands, riparian vegetation and suburban green areas.

Data were compiled from three sources:

1. Queensland Herbarium macrofungal collections;

2. Atlas of Living Australia;

3. Fungal lists and collections from the Brisbane west area by Nigel Fechner, Megan Prance, other WaCC volunteers and participants in the WaCC "Let's Go Mushrooming" walks.

The key activities organised to help achieve the project aims are outlined as follows:

1) "Let's Go Mushrooming" Program

An education day with the theme of Fungal Ecology with Dr Sapphire McMullan-Fisher and Megan Prance. This included a fungi foray in the morning and in the afternoon a presentation on fungal ecology was held at Mt Ommaney. Eleven participants, including several from the morning walk, attended.

Three public forays were held in 2014 with a total of 32 participants. Locations were at the Fort Bushland Reserve, Oxley, Wolston Creek Bushland Reserve, Riverhills and the Coucal Trail, Westlake.

2) April-June 2014: A library display produced by Yen Kheng Chua and Megan Prance was set up in Mt Ommaney Library and was seen by many residents. The poster boards were again displayed at a community event in June and were viewed by about 100 participants.

3) Collection of fungi found during forays, and identification work at the Queensland Herbarium by Dr Sapphire McMullan-Fisher. Volunteers were also trained on how to make quality fungal collections in the field for identification purposes.

4) Compilation of a list of local macrofungi and lichens.

5) Production of a modest field guide called "A little Field Guide to West Brisbane Fungi".

6) Participants who joined the Wolston and Centenary Catchments inc. (WaCC) were presented with collecting kits that included a collecting box, Fungimap mirror, pocket knife and a mini microscope hand lens to encourage future collecting.

An unplanned activity was the setting up of the SEQ Fungi Facebook group in May 2014. Brett Malcolm, one of the participants in the Fungal Ecology education day, started this group. It has grown steadily, currently having over 550 members, and continues to grow at about 100 members a month. There are many experts in the group, and collectively there is a depth of skill across many mycological topics. Facebook is proving to be an incredibly effective medium to promote mycological and environmental education. This fun group is engaging a new demographic in the love of macrofungi.

Prior to 2010, Queensland Herbarium only recorded 18 macrofungi from the study area. A search of *Atlas of Living Australia* in March 2014 generated 22,596 biodiversity records for the area, of which there are only 32 macrofungi, 79 lichenised fungi and 10 microfungi. The majority of the records are birds (20,028) and plants (1,580). This is consistent with the general lack of knowledge of, and investigations into, diversity of our fungi.

This project has helped to considerably improve our knowledge of fungi in the study area. Our list for the Macrofungi of Brisbane West stands at a total of 271 macrofungi and 103 lichens, but it is estimated that the study area could have 800-1500 macrofungi species. The relatively low diversity of macrofungi recorded in this project is more likely due to the limited number of surveys and time rather than the absence of species.

The list of Macrofungi of Brisbane West can be found in the full report on the WaCC website (http://www.wacc.org.au). Species found in the survey area included *Amanita pallidobrunnea*, *A. xanthocephala*, *A. nauseosa*, *Marasmius*

haematocephalus, *Russula kalimna*, *Leucocoprinus birnbaumii*, *Panus fasciatus*, *Lenzites acuta* and all four species of *Auricularia* found in SE Queensland. Other genera included *Cortinarius*, *Hygrocybe*, *Lepiota*, *Trogia*, *Lycoperdon* and *Xylaria*.

Table 1. Identification level of 103 Lichen and 271 macrofungi collections

Fungi	Gen	GS	Gtag	MG	Total
Lichens	2	11	90		103
Macrofungi	58	102	96	17	271
Total	60	113	186	17	374

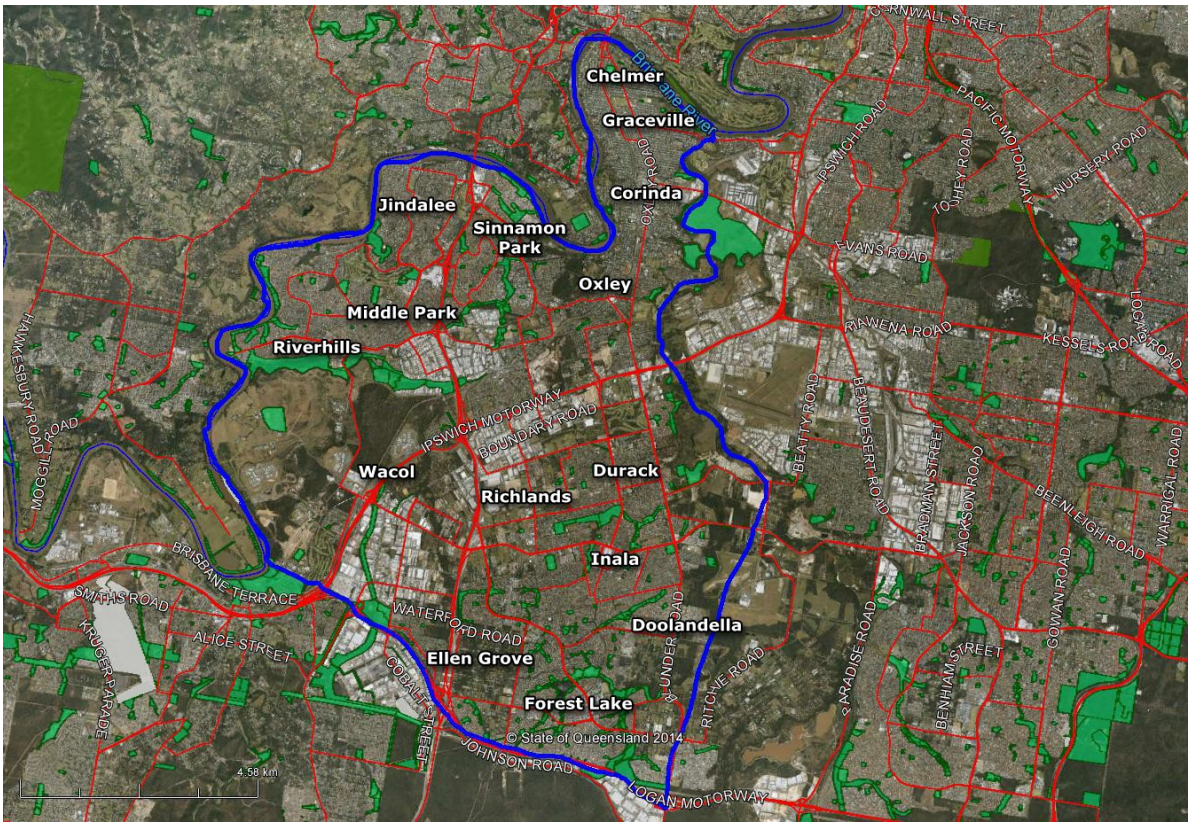
Levels of identification: **Gen**= Genus; **GS**= Genus & species; **Gtag**=Genus with "field name"; **MG**=Morphological group

This program had a "hook" that was new and fresh and attractive to a new audience. "Let's Go Mushrooming" touched a nerve and should be continued. Participants commented that the title reminded them of happy childhood memories.

The "Finding and Identifying Fungi of Brisbane West" project has brought about an improved knowledge of macrofungi that are found in Brisbane West. Through activities such as guided walks, presentations and interpretive displays, the project has engaged many participants in appreciating fungal ecology and diversity. Volunteers were also trained to assist in collecting quality specimens, which are invaluable for identification attempts at a later date. The project provided a good start in involving the community in documenting the fungal diversity in Brisbane West. Given the range of habitats in this study area, which indicates a potential for high fungal diversity, it is recommended that surveys and identification works be continued. The SEQ Fungi Facebook group is providing ongoing promotion and education about macrofungi.

The Field Guide is available for download as a .pdf from http://www.wacc.org.au or from the SEQ Fungi Facebook group https://www.facebook.com/groups/1468627836708011/

Acknowledgments This work was commissioned by Wolston and Centenary Catchments Inc (WaCC) committee and is proudly funded by a Lord Mayor's Community Sustainability & Environmental Grants Program Grant from Brisbane City Council.



Mycorrhizal Mysteries
Musings on Mallee Fungi

Frances Guard

Gluepot Reserve in South Australia's mallee region © Fran Guard

Birds Australia Gluepot Reserve is one of my favourite places in Australia. It is situated in South Australia, 64 km north of the small Murray River town of Waikerie. The property, a restored sheep station, covers about 54,000ha. Its vegetation is a mix of mallee (eucalypt) woodland with spinifex understorey on sand; *Casuarina* and *Acacia* woodland in clay soils, with bluebush(*Maireana*), *Senna*, *Eremophila*, *Olearias* and other low shrubs filling the landscape. It is in the 200mm rainfall region, and this rain falls mostly as sporadic storms at any time of the year. There is no definite "winter wet-summer dry" pattern in precipitation, as occurs in other parts of southern Australia.

Gluepot Sept-Nov. 2005 © Fran Guard

Over a 12 year period, I have visited and volunteered at Gluepot for almost 7 months. I have been fortunate to see the property at its best, when the bush has been alight with wildflowers, the six mallee species glowing with new growth, and the casuarinas covered in the warm reds and browns of their flowers. Most visits have coincided with significant storms that could have triggered fruiting of fungi. Eucalypts and casuarinas, in my understanding, are all mycorrhizal plants, so I would have expected to find at least some of the ectomycorrhizal fungi that one sees elsewhere in Australia. It appears that some of these families have dual ecto- and endo-mycorrhizal associations. This versatility may be an adaptation to survival in the harsh or fluctuating environmental conditions of Australia. (Brundrett MC. 2008. Mycorrhizal Associations: The Web Resource.) Because of drying of the continent over eons, perhaps hypogeous fungi could have become important. However, with no truffle-eating specialist mammals in this region, there would be no method of reliable spore dispersal for truffles.

However, in all my visits, I have found only seven species of fungi. Two of these, (the ubiquitous *Pycnoporus coccineus* and *Phellinus robustus*) are definitely not mycorrhizal. *Tremella mesenterica*, a strange fungus to find in such arid location, is parasitic on other fungi. That leaves only four species that could possibly be mycorrhizal.

Of these, only the large puffball, *Phellorinia herculeana* subsp. *herculeana*, was in association with eucalypts. I have only found it once, 12 years ago in October.

Phellorinia herculeana © Fran Guard

The other three species, which I found in May this year, were in an area of *Casuarina pauper* woodland.

Two were species of the stalked puffball, *Tulostoma*, which I keyed out in Cheryl Grgurinovic's "Larger Fungi of South Australia" to be *Tulostoma albicans* and *Tulostoma wrightii*. Her book contains 25 species of *Tulostoma*.

T. albicans is tiny, white, depressed subglobose, 4-5mm diameter, with a buried stalk of 10-12mm. The brown exoperidium remnants remain on the lower part of the

spore sac, and there is a small thickening at the base of the stalk. It has roughened subglobose spores, average 5.5 x 5.1μm.

T. wrightii is somewhat larger, off white, ~15mm diameter, a depressed globose spore sac, with a short tubular mouth; and a fibrous stalk of ~25 x 3mm, which remains buried. The spores are more heavily ornamented and globose to subglobose, average 5.4 x 3.8μm, with a warty surface.

Tulostoma spp.- large and small © Fran Guard

The third fungus among the *Casuarina* needles was a small earthstar. It appears to be in the same group as *Geastrum campestre* and *Geastrum clelandii*, but does not fit exactly with either of those species, nor any of the other 14 that Grgurinovic described. For the time being I will call it *Geastrum* "gluepot".

The *Phellorinia* may be mycorrhizal, but in the past, mycologists have thought that *Tulostoma* and *Geastrum* were all saprophytic (Kreisel 1969; Miller & Miller 1988; Sunhede 1989, cited in Agerer & Beenken, 1998). However, Agerer & Beenken (1998) demonstrated that *Geastrum fimbriatum* was ectomycorrhizal. By inference, other *Geastrum* species may also be ectomycorrhizal. A question still hangs over whether these *Tulostoma* species are mycorrhizal. Some *Tulostoma* species. have been found to be mycorrhizal in Brazil (Baseia & Milanez, 2002). This would mean

Geastrum "gluepot" © Fran Guard

that I have found one or possibly three mycorrhizal partners in the *Casuarina* woodland.

I am left with many questions about which fungi partner with the six healthy species of Eucalypt in the mallee woodland. Do they rely on puffballs only?

Are there other agaric or bolete partners that fruit so rarely that they are almost never seen? Have these mallees evolved to being endomycorrhizal only? Are there in fact some hypogeous fungi that use other means for spore dispersal than mycophageous mammals?

Perhaps DNA analysis of the roots and soil of the mallee will give us the answers.

Meantime, anyone visiting this beautiful region, should keep an eye out for any other ectomycorrhizal fungi.

References

Agerer R, & Beenken L (1998) *Geastrum fimbriatum* Fr. + *Fagus sylvatica* L. *Descriptions of Ectomycorrhizae* **3:**13–18.

Baseia, I.G. & Milanez, A.I. (2002) *Tulostoma persoon* (gasteromycetes) from the Cerrado region, State of São Paulo, Brazil- *Acta Botanica Brasilica*, **16(1):** 9-14.

A Fungus Beetle in Action

Glenda Walter

If you find little crawling things in or under a fungus, they may be the larvae of this brilliantly coloured fungus beetle, a species of *Episcaphula* (quite possibly *Episcaphula australis*, also known as 'pleasing fungus beetle'.) This beetle and many other beetle species, as well as fungus flies and fungus gnats, lay their eggs in fungi so that the larvae have a nutritious meal and a place to live. Some beetles eat fungi as adults, too. I was lucky enough to see (while without my camera) the large rectangular Ironbark beetle, *Zopherosis georgei*, on a fungus at Bellthorpe some time ago. It has been photographed on a fungus, and is thought to feed on bracket fungi.