THE QUEENSLAND MYCOLOGIST

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The Queensland Mycological Society

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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 10 November 2013, 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 secretary (info@qldfungi.org.au) of changes to their contact details, especially e-mail addresses.

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Cover photo: QMS held a successful Gasteromycetes workshop in Maleny on August 3, so at Megan's suggestion, a composite of assorted species. Outside, clockwise from top left: *Phallus multicolor*, *Crucibulum laeve*, *Phallus rubicundus*, *Lysurus mokusin*, *Scleroderma verrucosum(*?), *Cyathus olla*, *Geastrum floriforme*, *Aseroe rubra*, *Morganella purpurascens*. Centre: *Pseudocolus fusiformis*, *Lycoperdon pyriforme*.
Photo credits: *P. rubicundus*, *L.mokusin* and *A. rubra* © David Holdom, all other photos © Megan Prance.

Contents

QMS Calendar 2013

QMS Meetings 2013

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.

October 8
Speaker: Alistair McTaggart: Rust and smut fungi of Australia.

November 12
Speaker: TBA

December 10
End of year party. Members bring food to share.

Supper. Check the website for details of the supper roster.

QMS Forays 2013

The foray season for 2013 is now over, but it is possible that other forays will be organised late in the year depending on weather conditions. Check the website for information.

The regular forays are normally held on the Saturdays following the QMS meetings of February to July, but there may be exceptions as well as additional forays at other times. In addition, details may change as a result of drought or other unforeseen circumstances. Check the website for updates.

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.

QMS Workshop Program 2013

A Beginner's Guide to Basics of Fungi ID and Recording workshop will be held on October 12 at the Cubberla-Witton Catchments Network headquarters building at Chapel Hill.

Check the website for further details and changes.

Directions and further information will be provided to registrants

Members are invited to suggest topics for workshops. Send your ideas to Susan Nelles (info@qldfungi.org.au)

Fungimap Festival 2014

Fungimap Festival will be held from 24th to 27th April 2014 in Brisbane. It will be a combined event, with the Australasian Mycological Society, Fungimap and Queensland Mycological Society participating.

There will be lectures on a variety of Fungal topics on the first day, followed by two days of workshops and forays.

Many other exciting details are being worked on.

It is a great opportunity to hear top mycologists speaking in one location, and to meet other enthusiasts from interstate at the forays and workshops.

Please note it in your diaries.

Editor's Comments

Welcome new member Annie Gregory, who is also our youngest member.

Congratulations to Fran, Megan, Susan, Leesa, Adrian and Vanessa on an excellent workshop on Gasteromycetes that was held in Maleny in July. An enormous amount of preparation went into it, and that showed. The workshop report is on page 10. Hopefully the keys from the workshop will be placed in the member's area of the website in the near future. Thanks (I think) to Megan for the idea of a Gasteromycete composite front page, and for supplying most of the photos for it. But I might not do another one like that for a while....

There are also reports from the Ravensbourne/Crows Nest Maroochy Wetlands and Cooloola forays. Many thanks to John, Patrick and Fran for those.

An exciting (for me) find in the Maroochy Wetlands was a blue-grey fungus on picabeen palm seeds. I have seen the same fungus at Mapleton Falls and Mt Tamborine in winter and had thought that maybe it only occurred in the cooler higher places, but not so. Microscopic examination suggests that it is a synnematous species (definition below!) of *Penicillium*.

I have cultured the fungus from material provided by Patrick and it is now in Diana Leemon's lab at the Ecosciences Precinct in Dutton Park where I hope to work with Roger Shivas to identify it in the coming weeks. Synnematous *Penicillium* species have been described elsewhere and it remains to be seen whether this one is new or not.

My excitement stems from my having seen it before when I did not have access to a lab, and because I used to work with the so-called microfungi that infect insects, notably the Entomophthoromycota and more recently hyphomycetes such as *Metarhizium*, *Nomuraea* and *Beauveria* along with other more obscure genera.

Penicillium is a hyphomycete. Its sexual forms fall into (at least) two genera, *Talaromyces* and *Eupenicillium*. Therefore *Penicillium* as traditionally known is made up of more than one real genus.

Some definitions:

Synnemata (singular synnema), also coremia ("threads together") are erect reproductive structures borne by some fungi, bearing conidiophores that fuse together to form a strand (which can be quite thick). Conidia (spores) are produced on the outside of the synnemata. The photo of the picabeen seed fungus in the foray report on p7 shows thick blue synnemata emerging from the seeds.

Hyphomycetes (also called Fungi Imperfecti or Deuteromycetes) are asexual (anamorph) stages of Ascomycota. They constitute a "form-class" rather than a real taxonomic group. They can look totally different to the sexual (teleomorph) stage and in the past have been described as separate species that in many cases could not be associated with the ascomycete form. Now, molecular evidence is allowing them to be reliably combined and in future a single name must be applied to both forms if possible.

Fungi-linx

The ABC's Science Show on 24 August had two items on lichens:

Lichens reveal pollution from WA coal-fired power plant

http://www.abc.net.au/radionational/programs/scienceshow/lichens-reveal-pollution-from-wa-coal-fired-power-plant/4908444

The mushroom that isn't

http://www.abc.net.au/radionational/programs/scienceshow/the-mushroom-that-isne28099t/4908472

This video from ScienceAlert.com.au includes the fungus from the northwestern USA that is among the largest organisms on earth:

http://www.sciencealert.com.au/index.php?option=com_jusertube&view=video&rid=vWAA-SrrFUQ&yuser=PLI-6-wtgFSgC-nbpwvkTbTICySA2shfkV&auto=1&eh=385&ew=600&st=yes&height=500&width=600

Leesa sent in two links from Ted Talks

One is called *Six ways fungi can save the earth*, found at
http://www.ted.com/talks/paul_stamets_on_6_ways_mushrooms_can_save_the_world.html
I may have included that in a previous newsletter, but it is worth repeating.

The main Paul Stamets site (Fungi Perfecti) is at **http://www.fungi.com/**

The other is *My Mushroom Burial Suit* at -

http://www.ted.com/talks/jae_rhim_lee.html

There are several other talks by Dr Stamets and others referring to fungi on Ted Talks which are great.

I found a *Pleurotus* (probably *P. djamour*, thanks to Patrick for recognising it) on a mangrove stump near my home, and that led me to finding this *Pleurotus* site at the University of Tennessee in the the USA:

http://www.bio.utk.edu/mycology/Pleurotus/default.htm

More goodies at the parent site: **http://www.bio.utk.edu/mycology/default.htm**

Ravensbourne & Crows Nest National Parks Foray 19-21 April 2013

John Dearnaley

This was a really enjoyable weekend with a wide diversity of fungal species on display.

On the Friday afternoon we visited the lower section of Ravensbourne National Park which is brush box/turpentine forest rather than the semi-tropical rainforest that is typical of the reserve. This was a really special spot and we had 56 mycological records within a few easy hours of meandering.

Highlights included a clump of *Trogia subglobispora* var. *mellea* at the base of a brush box tree (this is the first record of the species for Queensland, Fig 1), some stunning orange *Ramaria* spp. (Fig 2) and a variety of *Russula* spp. including a colony of purple-capped *Russula clelandii* (Fig 3).

On the Saturday we moved 20 km north to Crows Nest National Park. This location is quite different from Ravensbourne with granite soils and open *Eucalyptus* woodland habitat.

Ectomycorrhizal taxa were abundant including a variety of boletes (eg. *Tylopilus*, *Boletus*, *Boletellus* and *Rubinoboletus* spp.), *Amanita*, *Lactifluus* and epigeous and secotioid *Russula* specimens (see Fig 4). This latter specimen was a lucky discovery as only a portion of the cap protruded above the sandy soil.

On the Sunday morning we walked the rainforest circuit at Ravensbourne National Park. There were several great finds including an unnamed, blue species of *Entoloma* (Fig 5), a species of *Gyroporus* that turned a bright purple upon cutting (Fig 6) and a species of *Clavulina* with upright white-grey branches (Fig 7).

Ravensbourne Field station provided basic but adequate accommodation for the group. The school house was particularly good for laying out microscopes and fungal specimens.

Fig 1. *Trogia subglobispora* var. *mellea.* Images showing upper and lower surfaces. ©Megan Prance

Special thanks must go to Fran & Bob, Gretchen & Bill, and Adrian & Leesa for providing some great food on Friday & Saturday nights.

Fig 2. Ramaria sp. ©Megan Prance

Fig 3. *Russula clelandii* (purple form). ©John Dearnaley

Fig 4. Unknown secotioid Russulaceae specimen. Top and side views. ©John Dearnaley

Fig 5. *Entoloma sp.* ©Megan Prance

Fig 6. *Gyroporus* "*austrocyanescens*". ©Patrick Leonard

Fig 7. Rainforest *Clavulina* sp. ©Megan Prance

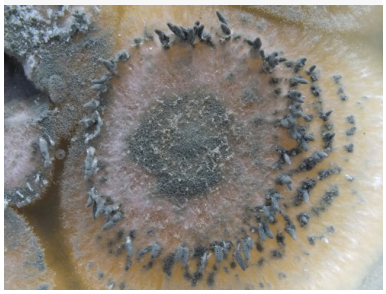
Maroochy Wetlands Foray, 6 July 2013

Patrick Leonard

Tidal wetlands supporting healthy populations of mangrove are a declining habitat in Queensland as they are elsewhere in the world. Biologically important because of their role in the provision of nursery sites for fish and crustaceans, they are poorly understood and seldom studied by mycologists. Members of the QMS had an excellent introduction to mangroves from Dr. Norman Duke, prior to our first foray to this habitat. Mangroves are not ectomycorrhizal, so the only fungi we expected to see were those which rotted leaves and trunks of these species.

The Maroochy Wetland Sanctuary proved to be a very good site for a foray. Judith Hewett who is a QMS member and a member of the Wetlands Support Group led us on the short walk from the centre, through the Sanctuary and down to the River. We started in what seemed a typical wet sclerophyll forest with gums, paperbarks, picabeens and vines at an altitude of 8 metres above sea level. There are no mangroves in this forest which is beyond the reach of the highest tides. There was a whole range of familiar fungi such as we might see in this habitat at some of our other regular sites. A bright blue-green xylarioid-looking fungus was present on the piles of picabeen seeds. This fungus, which has also been seen by David Holdom at Mapleton Falls and Mt Tamborine appears to be a synnematous (see Editors Comments on p4) *Penicillium* species, judging by the conidiophores and conidia (left). It has been cultured in the lab where it readily produces synnemata (lower left)

Picabeen seed fungus © Patrick Leonard



Penicillium conidiophores and conidia (top) and culture. © David Holdom

Mycorrhizal fungi associated with the gums and paperbarks were found including *Lactarius eucalypti* and *Thaxterogaster luteirufescens.* Because this is a humid to damp habitat, there was lots of litter from leaves, twigs and bark, and there were lots of wood rotting fungi still about. *Hypholoma australiense* was quite common in this area and we found *Chlorociboria* and a large patch of *Lachnum australiense* on a wet log.

Hypholoma australiense © Patrick Leonard

Half of all the records for the day were made in this habitat in the first quarter of the foray.

The habitat changes rapidly the moment one descends to the point where the highest tides reach. Paperbarks (*Melaleuca quinquenervia*) become the dominant tree, the first mangroves appear as do large mangrove ferns. There is much less litter on the ground and brackets become the more dominant fungi.

Lachnum australiense © Patrick Leonard

The next zone is dominated by *Allocasuarina glauca*, which prefers slightly raised sandy areas in the tidal zone. It has a dense litter layer of phyllodes, as the needles of *Allocasuarina* are called. In one small area we found three different fungi growing in this litter, a small bright orange capped *Marasmius* sp, an unidentified and probably undescribed *Crinipellis* sp and the rare *Mycenella margaritospora* not previously collected in Queensland and for which there are only three records in Australia, all from Victoria. This would appear to be an interesting habitat in that it contains unusual fungi. There were two polypores in

Allocasuarina glauca with tidal area in foreground
© Patrick Leonard

quite large numbers, neither of which could be identified.

More than half the walk was dominated by mangrove, five species are present at this site and the whole area is regularly inundated at high tide. There is no leaf litter at all, with crabs clearing any fallen leaves at every low tide, so there are no leaf or litter rotting fungi. The mangroves were also remarkably free of any wood rotting fungi. We only saw one unidentified polypore actually on a mangrove. Clearly there are some heart rot fungi at work as there are hollow trees, particularly amongst the older grey mangroves.

In all, we recorded 42 fungi on the day, a high total for a July foray. Much remains to be done to describe the fungi of the tidal wetlands, we suspect from our first visit, that many of the species in this habitat will be undescribed.

Cooloola National Park Foray, 15 June 2013

Fran Guard

This is the 4th year in succession that we have surveyed this site. Our surveys have been in late Feb/early Mar., mid and late June with different weather conditions. The interesting thing is that we have found more new fungi on each foray than repeats! The wallum, with scribbly gum, banksias, melaleucas and allocasuarinas, and small herbs and sedge understorey is particularly rich in mycorrhizal fungi. We have now found 7 different *Amanitas*, 3+ *Cortinarius* species, and about 6 *Boletes*

In total we have found 74 species, and only *Pycnoporus coccineus* has been found on all 4 occasions.

Notes on some of the Species seen:

Gymnopilus crociphyllus(left)

This is a very common fungus on dead logs in the Sunshine Coast region both in the wallum and up on the ranges. It is a brownish orange colour, which intensifies as it dries. It has narrow slightly punctate spores. Photo © Fran Guard

Psilocybe sp. (below)

A magic mushroom, growing on wallaby dung, it is one of several Psilocybes that grow on dung, and has a dark purple-brown spore print. Photo © Fran Guard

Cantharellus aff ochraceoravus (left)

Chanterelles have been found twice at Cooloola and there are usually a number of fruit bodies. They are likely to have been two different species. This one is more robust than others in Australia, and has a thick tapering stipe. (It may not be the same species as that described by Cleland and later by Grgurinovic.)

Like the European *C. cibarius* it is probably edible.Photo © Fran Guard

Lactarius eucalypti (right)

This was one of several fungi that fooled us initially. It was quite small and we first thought it was a Laccaria, only to discover when we turned it over and damaged the under side that it bled milk and was in fact *Lactarius eucalypti* – a small reddish *Lactarius. Photo © Fran Guard*

Boletus ovalisporus

Boletus ovalisporus is bright mustard yellow with many rhizoids and has been found at Cooloola. (No photo available)

Cortinarius sublargus (left)

One of two different *Cortinarius* species found on the day, *C. sublargus (left)* has rather large brownish fruit bodies, while the other (unnamed) species (below) had pinkish purple gills and a clear cortina staining tan from the spores. Photo © Fran Guard

Amanita grisella (left)

This Amanita is one of many grey species, which has a small bulbous base, a ring and patches of velar remains on the cap. It is hard to distinguish from *Amanita griselloides*, but using A.E. Wood's Key, this was my best estimate. Photo © Fran Guard

Amanita pallidochracea (right)

This Amanita was pale biscuit colour, no velar remnants on the cap, with a large saccate volva, no annulus, and inamyloid, elongate spores (10-12 × 5-6.5 µm, Q 1.75-2.13.) Interestingly in A.E.Wood's key to Amanitas, he has described it from only one specimen from near Casino. Photo © Fran Guard

Phellodon melaleucus

A very unusual toothed fungus.
(No photo available)

Hygrocybe graminicolor (left)

The last specimen for the day was this sticky little *Hygrocybe graminicolor,* which shows that "grass coloured" fungi aren't always that green. Photo © Lil Spadijer

Gasteromycetes Workshop Report

The very successful Gasteromycetes workshop was held at Maleny on August 3.

Note that the term “Gasteromycete” has no scientific validity, but is something of a “flag of convenience” for a disparate bunch of fungi that produce spores inside the fruiting body rather than on gills or in pores. It just happened to be convenient to include these fungi in the one workshop, which covered puffballs, stinkhorns, birds-nest fungi and earthstars, which are themselves not necessarily coherent groups (the term “group” is used very loosely here.) Past attempts to define formal groups within the Gasteromycetes have not been widely accepted).

Vanessa and Susan covered stinkhorns, Leesa and Adrian puffballs, Fran birds-nest fungi and Megan earthstars, with a general introduction to the keys from Megan. Material is being added to the website over time and can be accessed via this link: **QMS website: Gasteromycetes workshop**

Tometolithus novo-zelandius, Nidus lentilea, Arborastrum citrinus, Spherobolus golfianus and *Phallus chocomusaensis*. © Fran Guard

Introduction to Key to Genera

Megan Prance

It can be frustrating to find an interesting fungus and not know where to start to identify it. So at the workshop we attempted to find a starting place for a very large bunch of fungi without gills.

When we started preparing we checked the records to discover which species were known to occur or are likely to occur in Qld. We were surprised at how extensive the list is, but in most cases there are few collections of each species, so we have little information about differences between our specimens and those described from elsewhere. More work is needed to validate some of the records.

Now, on to the Key to Genera.

As a subcommittee we looked at several existing keys and found them all to be “wanting”, a quaint term, but it fits, with big holes in each of the keys we checked, such as outdated names or species missing. I searched further and found a paper by S.M Zeller, and combining information mostly from that and a key by Averil Bottomly, I presented a new key to genera at the workshop. This key targets all the genera known to be in Qld, but it needs more work. It will be revised so that it can appear on the QMS website.

The key proper is prefaced with four statements that describe each of the four “groups” covered in the workshop, so that if you have a Gasteromycete in front of you, one statement will fit and take you to the appropriate part of the key, then to genus or in some cases species.

The keys are dichotomous, meaning you have two statements: Select the one that most closely fits your specimen and that will lead you to the next pair of statements and so on, until you hopefully, get to the genus or species. We devised species keys for the groups we concentrated on and they were introduced through the morning. As with any key, it is important that once you get to a name, you check the species description.

The Key to Genera has a lot of technical terms, but participants had a glossary, which will also be placed on the website when the keys are. In the future I hope to simplify the language where I can. Feedback is welcomed.

The Earth Stars- *Geastrum*

Megan Prance

The name comes from *geo* meaning *earth* and *aster* meaning *star, and* refers to the behaviour of the outer layer of the fruiting body. At maturity, the outer layer or peridium splits into segments which turn outward to create a star-like pattern. The inner layer (endoperidium) is a spore sac. In some species, the outer peridium splits from a middle layer, causing the spore sac to arch off the ground, where it is said to be "fornicate". If the outer peridium expands to open when moist and then closes again when dry, it is described as hygroscopic.

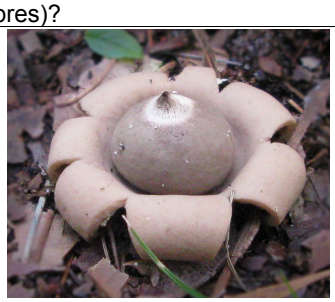
In some species, the spore sac is borne on a stalk or pedicel. The single mouth in most species of *Geastrum* is quite prominent. It often arises as a small cone at the apex.

Geastrum - Features to recognize

- **The mouth is most important:**

1. does it have a peristome (an edging around the mouth)?
2. is the mouth sulcate (grooved or fluted)?
3. is the mouth fibrillose (enclosed in a zone of parallel silky fibrils arranged radially, covered with silk-like fibres)?

Peristome sulcate.



Mouth fibrillose.

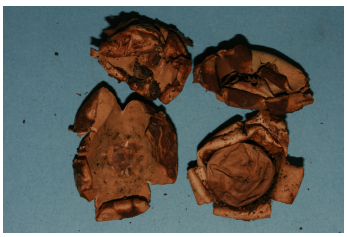
Is the endoperidium (the puff ball part) on a pedicel?

Or is it sessile (not on a stalk)?

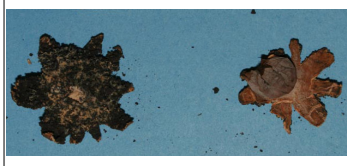
Is the fruitbody hygroscopic? This means an ability to respond to changes in moisture by opening and closing the rays– Did the rays wrap up around the endoperidium when it dried, as this *G. floriforme* has done?

This *Geastrum fimbriatum* has dried with the rays expanded. It is not hygroscopic.

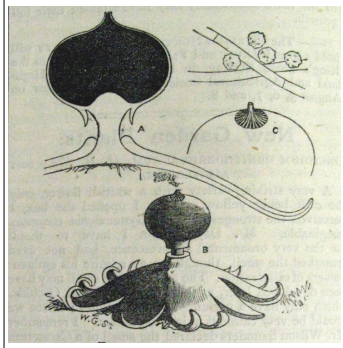
Are the rays fornicate? Have they raised the endoperidium up on an arch?



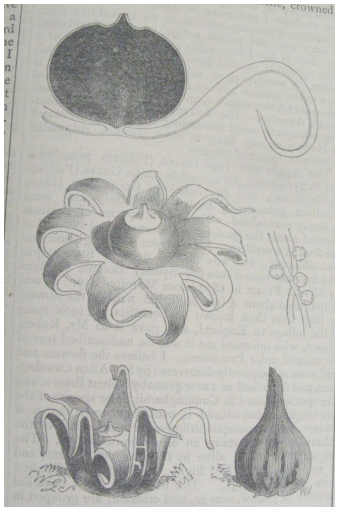
Is there an umbilical scar at the base of the fruitbody?



Is there debris embedded into the fruit body? Some species will be “clean” and others will have much debris clinging to them.



Geastrum pectinatum has revolute rays.



Are the rays involute? Do they curl under the fruitbody?

All photos by M Prance, 2 images copied from *The Gardeners' Chronicle and Agricultural Gazette*,1873

Queensland's Stinkhorns

Susan Nelles and Vanessa Ryan

Introduction

Stinkhorns come in amazing variety of bizarre shapes and bright colours. Even though they look so very different from one another, they all have a few things in common and this allows us to group them into the family Phallaceae.

Like other fungi, the main stinkhorn organism looks like a mass of fine, pale-coloured threads growing through mulch or leaf litter, sometimes even manure. However, when a stinkhorn is ready to reproduce, it does something a bit different. It grows an egg.

On the outside, this egg looks like a puffball. It is usually whitish in colour and has rootlets called rhizomorphs at the base. On the inside, though, a stinkhorn egg is quite different from a puffball. It consists of two or three layers of a soft, jelly-like material. The brownish-coloured innermost layer is the spore-mass - the gleba - and the baby stinkhorn forms within or around this gleba.

When it's ready, the egg splits apart and the mature stinkhorn's fruiting body, called the receptacle, emerges. The receptacle carries the thick, wet and slimy gleba with it out of the egg, exposing it to the air. The remains of the egg become a volva, which cups the base of the receptacle for the remainder of the stinkhorn's life.

Different types of stinkhorn carry their gleba in different ways. Some carry it directly on their stipe, others carry it on a cap, while others still hold it in their “arms”.

The gleba has a very strong smell - usually of rotting meat or faeces. And, so, it is this ripe, smelly gleba that give the group its common name of "Stink” horn. The origin of the “horn” part of the name is also quite obvious when you see a *Phallus* species...

The smell of the gleba and the bright colour of the receptacle is thought to attract insects, usually flies. The gleba sticks to the flies' bodies, much like a flower's pollen sticks to bees, to be carried away and eventually dispersed.

The flies also eat the gleba and, with it, the fungus' spores. The spores aren't digested, but are passed in the fly's excrement. So the insects disperse the fungus' spores in this second way, along with some fertiliser to possibly help them grow.

Stinkhorn spores all look pretty much the same – fairly cylindrical with a smooth surface. Some scientists think that this is so the spores can pass quickly and easily through the insect's gut. In comparison, the spores of other Gasteromycetes, which might rely on wind for dispersion, are usually round and covered with spines to help them catch the air.

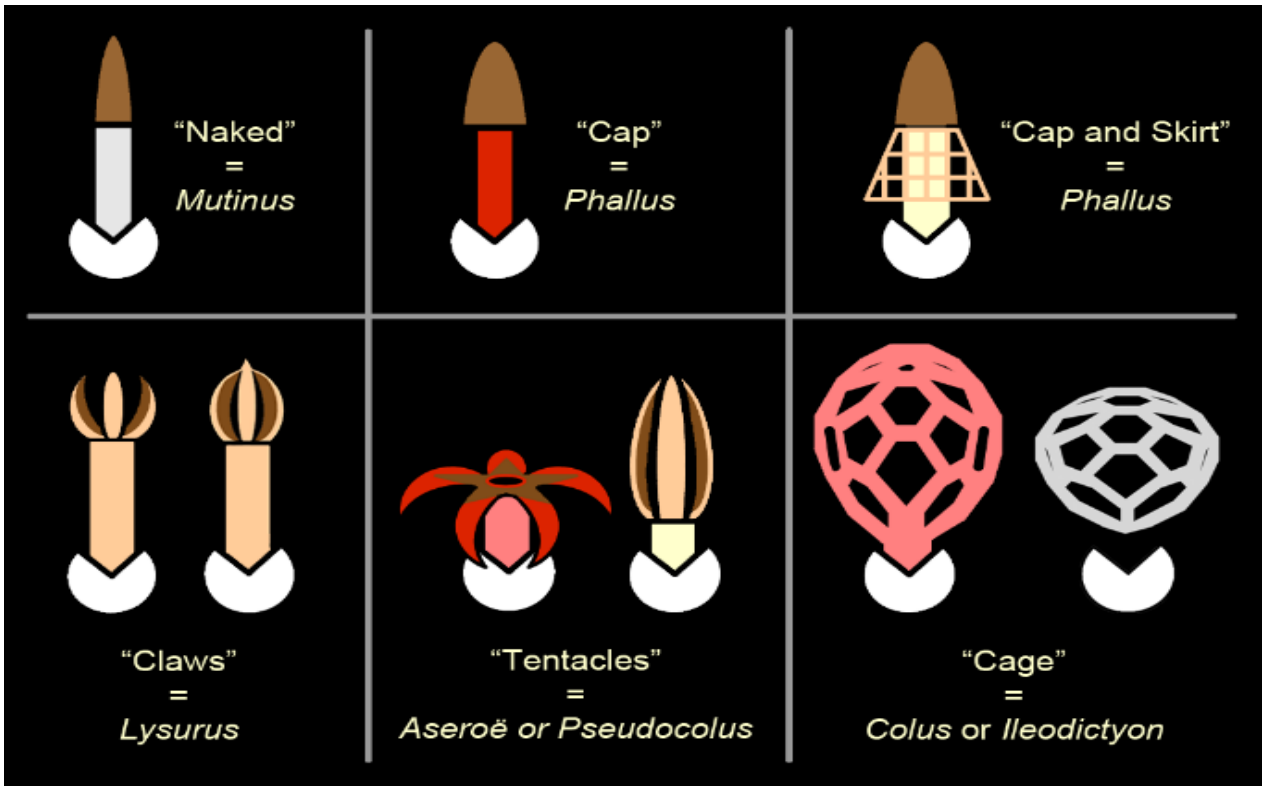
As mentioned at the start of this article, stinkhorns all belong in the family Phallaceae, but in the past they were divided into two families. The Phallaceae, which are the simple phallic-shaped stinkhorns; and the Clathraceae - the “Cage” stinkhorns, also known as the stinkhorns with "arms". For convenience of description we are using the old names, but bear in mind that the Clathraceae are no longer a valid group.

Phallaceae

There are two genera, *Phallus* and *Mutinus*.

1. Species with a “cap”

All three *Phallus* sp. have a pileus – a cap-like structure which at first is covered by the slimy gleba.



Some Stinkhorn Shapes © V. *Ryan*

2. Some species also have a "veil"

P. indusiatus and *P. multicolor* also have an indusium – a net-like veil which hangs like a skirt around the stipe and falls away as it matures.

P. rubicundus has a red stipe and no indusium.

There can be considerable variation in colour and size, but *Phallus* species are unmistakable. They occur throughout the year in Queensland, singly or in groups, and you can often smell them before you see them.

3. The "naked" species

Mutinus species are smaller, more slender stinkhorns. They have no pileus and no indusium. The gleba seems to be a continuation of the stipe and this spore mass extends up to cover the tapered, conical top.

There is not enough reliable information to give a description of *M. boninensis*, *M. borneensis* and *M. curtus* which are said to have been found in Queensland.

We hope to produce a *Mutinus* description sheet for our web site so that you can record comprehensive details for the herbarium if you should find one.

Clathraceae

Aseroë rubra – a stinkhorn with forked tentacles.
© Susan Nelles

Some of the Clathraceae look like real monsters! They have to be some of the strangest-looking fungi there are. However, you can use their weird shapes to help identify them fairly easily.

There are only three basic shapes to remember.

1. "Claws"

The first shape is a longish stipe topped by some short and upright arms that are shaped a little like claws.

These claw-like arms might be short and standing free from each other, or they might be curved inwards and joined together at the tips, forming a "lantern" shape. One of the common names for this particular species of stinkhorn is, actually, the "lantern fungus". We have three species of "clawed" stinkhorns in Queensland and they all belong to the genus *Lysurus – L. cruciatus, L. gardneri* and *L. mokusin.*

2. "Tentacles"

The second shape to remember is, we think, a natural progression from the first. The stipe is shorter and the arms are longer – they now look like tentacles.

Again, the arms might be free or be joined together at the tips. The arms might also be forked - one "tentacle" splitting into two. In Queensland, we have two confirmed genera that fit this second shape.

The first genus is *Aseroë*. These are the "Starfish Fungi" and, with their long tapering arms, they really do look a lot like starfish. We have two species of *Aseroë – A. arachnoidea* and *A. rubra.* You can usually tell the two apart by their colour and, more importantly, whether or not their arms are forked.

The second genus with long arms is *Pseudocolus*. Again, we have two species of these in Queensland - *Pseudocolus fusiformis* and *P. garciae* - and, again, the species can be identified by their colour. We might also have a member of a third genus of long-armed stinkhorn, but it isn't confirmed – *Anthurus brownii*.

3. "Cages"

The third and final shape to remember is the most complicated. Where there is some forking of the arms in our second shape, these fungi have taken it to the extreme. Their arms branch and join repeatedly to form a complicated clathrate or "lattice-like" structure. It is this group from which the Clathraceae originally took their name. They are commonly known as the "cage" fungi. Queensland has two genera of cage fungi.

The first of these genera is *Colus*. Our two species of brightly coloured cage fungi both belong to *Colus – C. hirudinosus* and *C. pusillus.* These fungi actually come in a range of colours – from a yellowy-orange through to a rich red. Both *Colus* species have a short stipe, sometimes hidden by the volva.

If you find a white-coloured cage fungus, you have found an *Ileodictyon*. This is our second genus of cage fungi. There are only two described species of *Ileodictyon* in the world and Queensland is lucky to have both of them – *I. cibarium* and I*. gracile*. *Ileodictyon* species usually don't have a stipe and can come free from the volva when fully expanded.

Conclusion

Queensland is fortunate in that it has quite an array of stinkhorn species. They come in many different shapes and colours, but they all grow from an egg and they all carry a smelly and slimy gleba on an exposed surface.

According to Wikipedia, there are 21 genera and 77 species of stinkhorns world-wide. As with many other kinds of fungi, not much is known about stinkhorns and there are probably many more species out there that haven't yet been described.

Some stinkhorn species have been introduced to other countries through the importation of mulch and fertiliser. We need to be aware of how quickly and easily these species can become naturalised.

Also, some other states of Australia have stinkhorn species that haven't yet been officially recorded in Queensland. They might be here, we just don't know.

So, the next time you collect a stinkhorn, please try to record as many details of the fresh specimen as you can. In particular, remember that we need to gather more information about our *Mutinus* species.

And, you never know, as with the recent discovery of *Aseroë arachnoides,* you might even have the luck to find a species new to Queensland!

A few words about puffballs

Collated by Adrian Harris and presented by Leesa Baker

This material was gathered from several texts and websites including AVH, ALA and Fungimap. Only four genera, *Bovista*, *Calvatia*, *Lycoperdon* and *Morganella* (but several species from each genus) were covered in the workshop as they are the most sighted/documented genera in Queensland. Thanks to the many QMS members who assisted us.

General Information:

- If possible, when collecting specimens for cataloging, gather them at various stages of maturity as they can be quite difficult to identify at any single stage in the fruiting cycle.
- The puffballs currently belong to the Agaricaceae, formerly being classified as belonging to the Gasteromycetes.
- The word Lycoperdon is translated to mean 'wolf fart'.

General characteristics:

- Spore dispersal is via a 'bellowing' or puffing action usually initiated by external, mechanical means for example; raindrops landing on the outer casing causing spores to 'puff'out through a small opening (apical pore/split) at the top of the fruit body; or by disengaging from the rhizoid base (single rooting strand) (some *Bovista* species) and rolling around, being blown by the wind or by disturbance from an animal.
- Usually globose (round) to upside-down pear-shaped and almost all are small to medium sized fungi. The major exception is *Calvatia gigantea* which can be huge, with some specimens documented at 150cm across and weighing in at 20kg!
- Most have a white through pale cream to pale brown coloured outer casing (exoperidium) with a couple of exceptions including *Calvatia lilacina* which, as the name suggests, has a lilac appearance, darkening to deep brown at maturity/decay.
- All have two outer layers (peridia) excepting *Calvatia,* which only has one.
- Have a spongey/soft rubbery feel when pressed lightly.
- Mainly occur in grassland or decaying leaf litter (except *Morganella* and *Lycoperdon pyriforme*) which occur on dead or decaying wood.

It is useful to know the general differences between the four genera covered at the workshop when out in the field. The main ones are listed below.

Bovista	***Calvatia***	***Lycoperdon***	***Morganella***
● Spores remain amongst the capillitia (a mass of sterile fibers within a fruit body) as a cottony clump at maturity. ● Some break away from their rhizoid base (single rooting strand) and roll around to disperse their spores.	● Genus contains the largest species of puffball. ● Only genera of puffball to have a single layer of peridia which breaks down/falls away (all others disperse through an apical pore/split) to expose the sterile base, spores being dispersed by the wind.	● At maturity, the spores tend to sit in the base as a powdery mass. ● This genus has a more distinctive sterile base (appearing as a pseudostipe – like a stem) than other puffballs.	● Found growing on decaying wood as opposed to amongst leaf litter, in grass or on sand/soil.

And a few pictures……

Calvatia lilacina note the distinctive lilac colouring, quite different to the usual pale white to brownish yellow most common in puffballs. Photo © Ross Tait

Lycoperdon perlatum (note the elongated pseudostipe appearing as a 'stem'. Photo © Richard Hartland, Atlas of Living Australia. (Click here for original)

Calvatia gigantea – the largest species of puffball. The Calvatias are also the only species of puffball to have a single layered peridia (skin). Photo Wikipedia/Creative Commons. http://en.wikipedia.org/wiki/File:VesseGeante.jpg

Introduction to the Nidulariaceae (Birds Nest Fungi)

Fran Guard

These small fungi are one of the most fascinating groups in the Gasteromycetes or "stomach fungi". Part of their fascination lies in the way their spores are produced and dispersed. The spores are formed inside tight hard packages, called peridioles, commonly known as "eggs", inside the developing fruit body ("nest"). The peridioles are ejected from the nests when subjected to raindrops, and are flung some distance away, the open mature nests acting as splash cups.

In some species, the peridioles then attach by an elastic cord to grass or plant stems, which are eaten by a herbivore. They then travel through the animal's gut and are passed intact in its dung, where they may later germinate. *Cyathus stercoreus* life cycle follows this pattern. Other species grow in well-manured litter, on twigs and in potting mix, without passage through an animal.

In Queensland, the most common species in the Herbarium is *Cyathus stercoreus.* However, there have been several collections of a different species made recently and these are *Cyathus olla.* One other species has also been found on a few occasions in South East Queensland, and that is *Cyathus striatus.*

Descriptions of these three follow. (*Cyathus gracilis, Cyathus colensoi and Cyathus novae-zelandiae* are rare, with only one possible collection each, and will not be described here.)

Cyathus stercoreus has a brown, shaggy hairy cup exterior, smooth cup lining, funnel shaped, with or without a short stem, 6-15 mm tall and 4-8 mm wide at the upper margin; it contains approximately 20 black peridioles, 1-2 mm diam.; spores are large, subglobose, variable in size, 20-30 × 18-25 µm; it occurs on well-manured soil or dung, with a large red-brown emplacement. Photo © Megan Prance

Cyathus striatus may be any shade of brown, shaggy, woolly cup exterior, striate, plicate lining, inverted cone shape with no stem, 7-10 mm tall and 6-8 mm wide at upper margin; it contains <16 somewhat triangular shaped, grey-brown peridioles, 2 mm diam.; spores are ellipsoidal, 15-20 × 8-12 µm; it occurs on twigs, mulch or small logs, with a distinct emplacement. Photo © Fran Guard

Cyathus olla is grey to fawn grey, slightly shaggy cup exterior, but unlike the other two species described here it has a wide flaring wavy upper margin, smooth cup lining, broad funnel shape with no stem, 10-15 mm tall and 8-12 mm wide at the upper margin; it contains <10 silvery-grey peridioles, up to 3.5mm diam.; spores are ovate, 10-12 × 6-8 µm; it is found in mulch and potting compost. Photo © Fran Guard

Note: colour of cups varies with age; degree of hairiness also varies with age and weathering; size and colour of peridioles is, I think, not a very reliable characteristic.

Overall shape and size of the cups when fresh is helpful. Spore size and shape is the most useful characteristic in my experience.

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