

# 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.

## 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](mailto:memsec@qldfungi.org.au)) of changes to their contact details, especially e-mail addresses.

## The Queensland Mycologist

*The Queensland Mycologist* is issued quarterly. Members are invited to submit short articles or photos to the editor for publication. It is important to note that it is a newsletter and not a peer-reviewed journal. However we do aspire to high standards of accuracy.

Material can be in any word processor format, **but not PDF**. The deadline for contributions for the next issue is **15 February 2019**, but if you have something ready, please send it **NOW!** 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. The standard font used for text is Gothic 720BT, 10pt, with other sans serif fonts used for headings and captions. Font sizes may vary if required to make articles fit the available space, and text may be edited for the same purpose.

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 possible to comply. Material from published sources (including the internet sites such as Wikipedia) may be included **if that complies with copyright laws and the author and source are properly acknowledged**. However extensive verbatim copying is not acceptable.

## Cover Illustration

What is an orchid doing on the front cover of a QMS newsletter? Read the article on *Serendipita* on page 7 to find out. This photo is of a *Caladenia* orchid. Image © Vanessa Ryan.

## QMS Committee

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## QMS Activities

### Meetings

Meetings are held in the F.M. Bailey Room at the Queensland Herbarium, Mt Coot-tha Botanic Gardens, Mt Coot-tha Road, Toowong, 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 Committee.

The timetable for 2019 is still under development, but the first meeting, in February, will be addressed by Dr Sapphire McMullan-Fisher. Not to be missed; Sapphire is always great value!

To assist those unable to attend meetings, notes on the talks are included in the Queensland Mycologist and on the website if 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, and not all talks are written up for the newsletter. 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. Please bring a plate if you can.

### Forays

QMS hold regular forays during the first half of the year. The dates are nominally the 4<sup>th</sup> Saturday of the month, but actual dates may vary and additional forays may also be held. In 2019 there are two forays in each of March, April and May. 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 Susie Webster or another member of the Committee.

### Workshops

What do you, our members, want to learn more about that could be presented in a workshop? QMS is always on the lookout for workshop ideas. Members are encouraged to suggest topics, whether new or reruns of past workshops.

Send your ideas to Judith Hewett or Wayne Boatwright ([info@qldfungi.org.au](mailto:info@qldfungi.org.au)).

Details of workshops will be included in newsletters and on the QMS website as they become available.

## QMS Calendar – 2019\*

MONTH	MEETINGS	FORAYS/WORKSHOPS
January	No meeting	26 <sup>th</sup> WORKSHOP How to collect specimens on behalf of Herbaria
February	12 <sup>th</sup> Sapphire McMullan-Fisher: Fabulous Fungi & what they are doing in our bushland	16 <sup>th</sup> FORAY Ben Bennett Reserve, Caloundra
March	12 <sup>th</sup> TBA	9 <sup>th</sup> FORAY Linda Garrett Track, Mapleton 23 <sup>rd</sup> FORAY Binna Burra, Scenic Rim
April	9 <sup>th</sup> TBA	13 <sup>th</sup> FORAY Mt Cordeaux. Tarome 27 <sup>th</sup> FORAY Chermside Hills, Brisbane
May	14 <sup>th</sup> TBA	11 <sup>th</sup> FORAY Cooloolah National Park, Lake Cooroibah Section 25 <sup>th</sup> FORAY John Oxley Reserve, Murrumba Downs
June	11 <sup>th</sup> TBA	8 <sup>th</sup> FORAY Maroochy Bushland, Tanawha
July	9 <sup>th</sup> TBA	13 <sup>th</sup> FORAY Bellthorpe
August	13 <sup>th</sup> TBA	
September	10 <sup>th</sup> TBA	
October	8 <sup>th</sup> TBA	
November	12 <sup>th</sup> TBA	
December	10 <sup>th</sup> TBA	Christmas Break

\* The calendar for 2019 is not yet finalised. Check the website for updates

### Editor's comments

In this final newsletter for 2018, we have articles based on presentations on powdery mildews by Levente Kiss, and on *Serendipita* by John Dearnaley. Neither group of fungi is the normal focus of QMS activities, but they are fully worthy of our attention. Both authors are at the University of Southern Queensland, an institution that is building a significant capability in mycology, something to be greatly welcomed.

Pat Leonard has summarised and responded to a Qld Audit Office report on the Department of Environment and Science (DES). It must be noted that the views expressed are Pat's, and should not be taken to reflect those of all QMS members, some of whom may be employed by DES or another Qld Govt department.

Pat's report does, however, raise important issues that are deserving of serious discussion within QMS. I have stuck my neck out and added a few comments

at the end of Pat's report, some in defence of DES.

I would like to take this opportunity to thank all those who have contributed to the newsletter, and that hidden army of helpers who proof read drafts and save me from a great deal of embarrassment by finding all manner of typos, spelling errors, technical errors and problems with layout, all the way down to incorrect fonts that have crept in. The newsletter is as good as it is because of all those people.

In particular Nigel Fechner provides essential technical input regarding correct names and other issues, as well as having a spectacular eye for errors in spelling and grammar. Thanks also (in no particular order) to Megan Prance, Susan Nelles, Vanessa Ryan, Fran Guard, Pat Leonard, Diana Leemon, Wayne Boatwright and Barry Muir. Apologies to any I missed.

Merry Christmas and happy New Year!

## A call out for specimens of powdery mildew!

**Kaylene Bransgrove and Levente Kiss**

Well known to gardeners and farmers alike, powdery mildews (PMs) are a large group of fungi (order Erysiphales) that form a white, powdery mass on leaves, stems and other aerial plant parts (Figs. 1-4) and can cause significant yield losses in agricultural crops. They don't do a great deal of damage in the garden, but are considered unsightly and are generally unwanted. They are most frequently found on leaves and are difficult to confuse with other fungi, so, once you start noticing them, you will see them almost everywhere!



**Figure 1:** PM on *Plantago lanceolata*. © Levente Kiss



**Figure 2:** PM on *Araujia sericifera*. © Levente Kiss

The taxonomy of PMs has undergone significant changes in recent years, a change that has reduced the number of genera and simplified identification. Originally, it was based on the morphology of the chasmothecia (the sexual morphs containing asci and ascospores). They have simple to ornate appendages (Fig. 5) and were thought to be integral to separating species and genera. However, the sexual morphs of PMs are rarely found in tropical and sub-tropical areas and have only been found in a very few instances in Australia at all, making morphological identification difficult.

Recent work incorporating molecular studies has shown that there are fewer genera in total and the sexual morph is less important from an identification and classification perspective than previously thought. We now know that the morphology of conidiophores is much more useful than the chasmothecia (Fig. 6). This is rather unusual in fungi but definitely makes life easier for identification purposes!

There are approximately 10,000 species of PMs belonging to 18 genera.

Australia has very few native species of PMs, if any at all, and most species were found on introduced plants. The first checklist of PMs present in Australia is currently being compiled.

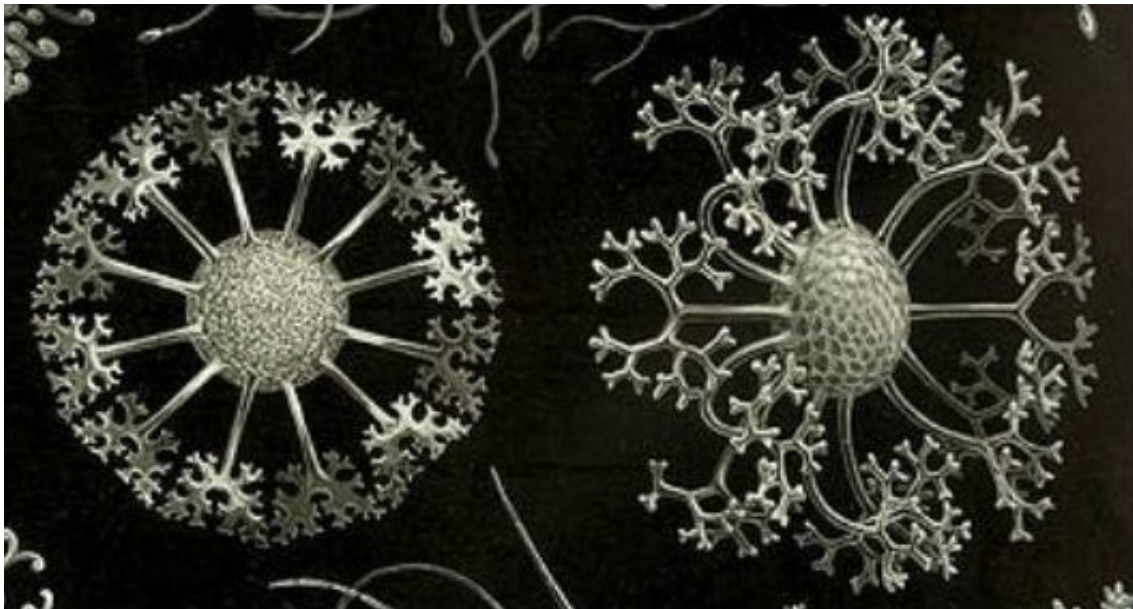
Professor Levente Kiss, from the University of Southern Queensland (USQ), Toowoomba, is one of the world experts on PMs. He joined USQ from Hungary in 2017. Prof. Kiss is actively building a research programme on Australian powdery mildews, focusing on those that impact agriculture and native vegetation alike. To do this, specimens of powdery mildew from all environments are needed to build a better picture of PMs in Australia, their host ranges and the environments in which they are found. These specimens would also be used in taxonomic research to investigate new species of PMs in Australia.



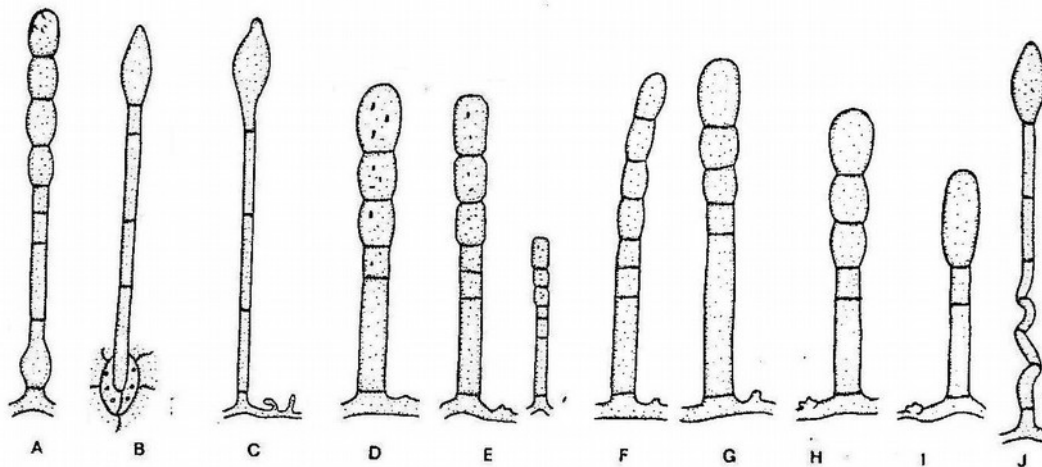
**Figure 3:** PM on Barley. © Levente Kiss



**Figure 4:** PM on Goji berry. © Levente Kiss



**Figure 5:** The sexual morphs (chasmothecia) of some powdery mildews, depicted by Ernst Haeckel in 'Art Forms in Nature' (Originally published in sets of ten from 1899 to 1904)



**Figure 6:** Conidiophore types of PMs (Braun & Cook 2012). Conidia produced in chains: A, D, E, F, G, H; conidia formed singly: B, C, I, J; crystalline inclusions (fibrosin bodies) in conidia: D and E; conidiophores through stomata (from a partly endophytic mycelium): B

So! Next time you are in your garden or out foraging, keep your eyes out for powdery mildews and (if you have permission or a permit to collect) please get collecting!! A few simple steps for collecting powdery mildews are outlined below.

1. Record the date, location, GPS co-ordinates if possible, host (plant) name, habitat and any general notes about the specimen or plant.
2. Take photos of the symptoms *in situ*, before removing any powdery mildew-infected parts of the plants.
3. Remove plant organs, e.g. leaves, stems, flowers, young fruit, covered with powdery mildew mycelium.
4. Prepare as you would any plant herbarium specimen by pressing flat and drying the plant

material in newspaper in a press or under a heavy book or two.

5. Please send dried specimens directly to Prof. Levente Kiss, University of Southern Queensland, Centre for Crop Health, Toowoomba Qld 4350. Please email Prof. Kiss directly before sending specimens or if you have further questions ([Levente.Kiss@usq.edu.au](mailto:Levente.Kiss@usq.edu.au))

#### References

Braun U & Cook RTA (2012) Taxonomic manual of the Erysiphales (Powdery mildews). *CBS Biodiversity Series No. 11*. CBS-KNAW Fungal Biodiversity Centre, Utrecht, Netherlands.

Glawe DA (2008) The powdery mildews: A review of the world's most familiar (yet poorly known) plant pathogens. *Annual Review of Phytopathology* **46**: 27-51.

# ***Serendipita* - Mycorrhizal fungi with potential in sustainable agriculture.**

John Dearnaley

Adapted for the newsletter by Diana Leemon

## **Background**

*Serendipita* is a genus of basidiomycete fungi within the family Sebaciniales, which phylogenetically sit between (therefore close to) the Auriculariales and Cantharellales. The *Sebacina* fungi are mycorrhizal with orchids, liverworts and Ericales plants. The genus *Sebacina* was first described in 1871, named in reference to the longitudinal septa in the basidia.

*Sebacina vermifera*: Described in 1964, and had basidiospores that looked like nematode worms. It was noted as being a parasite of corticioid fungi.

*S. vermifera* was first recognised as a symbiont of Australian orchids, in particular the *Caladenia* orchids (Fig. 1), in 1967. The genus *Serendipita* was created in 1993 from a study of corticioid fungi on logs in southern England. Three species, *S. sigmaspora* (with snake-like basidiospores); *S. orlinesis* and *S. evanescens* were described. The name *Serendipita* means a “lucky mistake”.



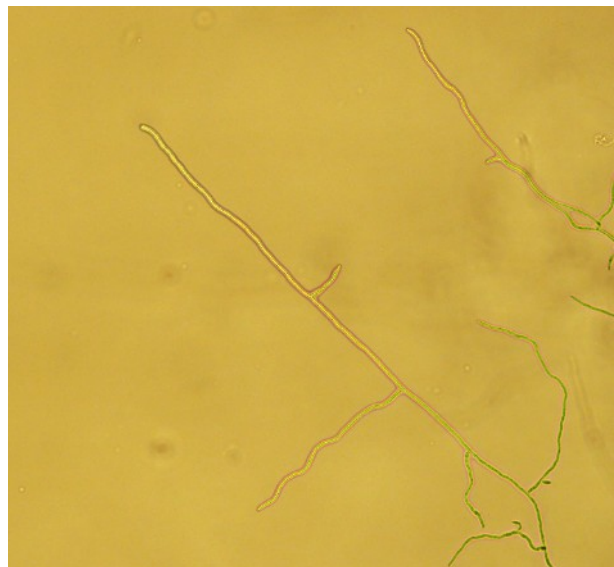
**Figure 1:** *Caladenia* orchid growing in SE Queensland

We now know that *Serendipita* fungi are everywhere in natural systems – and can be regarded as healthy soil markers – and that these ubiquitous fungi had previously been overlooked.

However their presence is disrupted by intensive agriculture. It has been shown that the presence of *Serendipita* decreases in soils treated with high levels of pesticides, inorganic fertilisers and fungicides. If an agricultural system returns to organic farming with low inputs of synthetic pesticides, fungicides and fertilisers however, then *Serendipita* fungi will return.

## **Features of *Serendipita***

An important feature of this group of mycorrhizal fungi is that they can be grown in culture, where, although very slow growing, they produce a cream coloured mycelium. The hyphae have characteristic right-angle branching, similar to those of *Rhizoctonia* fungi (Fig 2), as well as constriction points on the branches..



**Figure 2:** *Serendipita* hyphae showing right-angle branching

## **Taxonomy**

There potentially are far more species than currently described as there are hundreds to thousands of sequences deposited in GenBank. Current species comprise:

*S. herbamans*. In culture cream to orange brown, cross walls in hyphae and spores have a “hole” within them to help movement of materials. This species has been found in an array of herbaceous plants including *Plantago* and *Triticum*.

*S. indica*. Formerly called *Piriformospora indica* (=spores shaped like pears). Isolated in India, this species has been found to drought proof plants. It has also been found within arbuscular mycorrhizae spores.

*S. williamsii*. Spherical and pear shaped spores, from *Microtis media* (the onion orchid).

*S. vermifera*. This species is mostly associated with orchids; *Caladenia* orchids (pink spider/fairy

orchids) always have *S. vermifera*. In Australia however, *S. vermifera* seems to be a species complex. One study using DNA analyses discovered 6 OTUs which were associated with *Pheladenia deformis*, and with *Caladenia* species from SW Australia. (An OTU is an "operational taxonomic unit", a natural grouping that can be seen from analysing the DNA.) A study undertaken by the WA Botanic Gardens, isolated 8 different 'Sebacina' OTUs from 47 SW Australian *Caladenia* species. Neither of these two studies specifically related these OTUs to *Sebacina vermifera*.

## Uses of *Serendipita* fungi

Researchers have investigated a number of potential applications for these fungi.

- Plant conservation – *Ex situ* seed germination: Some orchid seeds will not germinate without this fungus. *Serendipita* shows great potential for use in restoration work.
- Protection from drought stress – This has been demonstrated using *Piriformospora indica* in *Arabidopsis thaliana* (a member of the mustard family often used as a model experimental plant) and *Brassica rapa* (Chinese cabbage cultivar), and, using *Serendipita vermifera*, in switch grass (*Panicum virgatum*), a bio-fuel plant that will grow on marginal land.

- Increasing plant growth. The growth promoting effect of *P. indica* (*S. indica*) has been shown in maize, poplar, parsley, *Arabidopsis*, wheat, barley, switch grass, tobacco and *Artemisia*. Even the culture filtrate in which *Serendipita* fungi were grown was shown to increase shoot and root biomass in maize.
- Protection from fungal pathogens – *Serendipita* fungi can protect against *Fusarium* in wheat and barley, *Verticillium* in tomatoes and powdery mildew in barley.

## Investigations into *Serendipita* at USQ

Assoc. Prof Dearnaley's laboratory at USQ has been investigating a number of aspects of *Serendipita*. These include the isolation and characterisation of new species of *Serendipita* from leafy liverworts and unexplored orchid genera; investigation of the *Serendipita* life cycle including the production of sexual fruiting bodies and the potential of *Serendipita* in bio-protection of tomatoes against powdery mildew and *Fusarium* root rot. To date a number of new species have been isolated from a range of orchid species and much progress has been made in elucidating the life cycle of these hitherto little understood but critical fungi. These findings are laying the foundation for future applications of *Serendipita* in sustainable agricultural systems.

## Conserving Threatened Species

Patrick Leonard

### Introduction

The Queensland Audit Office (QAO) has published a report on the performance of the Queensland Government in achieving its policy objectives on the conservation of threatened species in Queensland. The Report was tabled in Parliament on 13 November 2018. It is available from the QAO: <https://www.qao.qld.gov.au/reports-parliament/conserving-threatened-species>

Members of the Queensland Mycological Society might wonder what this has to do with Mycology. This review sets out the main points in the report, comments on some of the findings and then tries to explain why this is important for the mycological community. Members will be aware that all fungi in Queensland are currently listed as being of 'least concern' under current legislation and they do not feature in the QAO report since they do not feature anywhere in the work programme of the Department of Environment and Science (DES) that the QAO were assessing.

## Queensland Audit Office Report

So here is a brief summary of the QAO findings with a commentary.

**QAO:** Queensland is home to 85% of Australia's native mammals, 72% of its native birds, just over 50% of native reptiles and frogs and 11000 plant species (including exotic plants and weeds). Queensland has 955 threatened species listed under the Nature Conservation Act 1992.

**Comment:** Queensland possibly has some 50,000 fungi (likely less if only macrofungi are considered, more if microfungi are included), and if so well over half of them have not yet been scientifically described. All those that have been described are listed as being of 'least concern' which suggests that someone has assessed them and decided that there are viable populations. No such assessments have been made.

**QAO:** The Department of Environment and Science lists the main threats to Queensland's threatened species as:

- clearing of vegetation
- invasive plants and animals

- inappropriate grazing and fire regimes
- climate change

**Comment:** One can only agree. There are of course invasive fungi as well, one only needs to think of myrtle rust or *Favolaschia calocera*, the ping-pong bat fungus now invading Lamington and other South-east Queensland national parks.

**QAO:** Management actions to protect and recover threatened species should include:

- assessing species extinction risk
- identifying and managing threats
- prioritising species for management and implementing targeted actions

**Comment:** agreed, but it should include all the fungal species on which plants and animals depend for sustenance.

**QAO:** The department (DES) does not systematically review the classification of threatened species. The department does not publish a list of nominations received.

**Comment:** As far as one knows the QMS are the only organisation to have submitted any fungi and both our candidates were rejected by the Species Technical Committee in 2016.

**QAO:** The Federal Government and the states have agreed to adopt a Common Assessment Method for threatened species aligned to the categories adopted by the International Union for Nature Conservation (IUCN). The department has not developed comprehensive project governance covering all elements of its implementation of the Common Assessment Method.

**Comment:** It is good to see a commitment to alignment of the Queensland legislation to Federal and IUCN standards. The QAO suggests that Queensland may not meet its commitment under the (COAG) memorandum of understanding because senior management are dragging their feet. One wonders if the Minister is aware of what is going on here.

In one respect the memorandum of understanding fails to deliver alignment with the IUCN. The category of 'least concern' in IUCN terms means that an assessment has been carried out and concluded that there is a viable population of a particular species. It did not qualify to be placed in any of the threat categories or in the dustbin category of 'data deficient'. But the IUCN also have a category of 'not assessed' into which something like 49,998 Queensland fungi might be placed. This is a critically important issue for fungi, and a

measure of what governments have so far failed to do.

**QAO:** Queensland does not have an overall strategy to manage major threats and reduce the impact on threatened species.

**Comment:** one can only agree and speculate that, if it did, it would not include the kingdom Fungi.

**QAO:** Habitat loss is the greatest threat affecting Queensland's threatened species. A key challenge for Government is that actions to prevent habitat loss can compete with social and economic practices in rural and mining industries and with urban development. (The figures detail the extent of losses are summarised in the report on pages 36-38, Figures 4B and 4C).

**Comment:** the Government needs to step up to this challenge. It is likely that habitats affording protection to flora and fauna will be those that also afford protection for fungi. But, putting fungi in to the equation could well influence what management measures are considered.

**QAO:** Currently, 8.2% of Queensland is protected in national parks, resources reserves and nature refuges. In the long term the Queensland Government has committed to expanding the protected area estate to 17% of the state. To support this target the 2010 Biodiversity Strategy projected increases in different types of protected areas to protect approximately 11.5 % of the state by 2020.

**Comment:** the target has only ever been met in one year, 2011, and the protected area actually shows a small decline in 2017.

**QAO:** Environmental offsets may be needed for certain developments where there is an unavoidable impact on significant environmental values. An offset compensates for the loss by providing an equivalent conservation outcome elsewhere.

**Comment:** there is no evidence to support the contention that offsets work for fungi, or that they can successfully be transferred to a new site. The Government has committed to a review. it is important that the effects on fungal communities are considered as part of this.

#### **Conclusions:**

The Queensland Audit Office report provides a very good summary of the current policies and activities of the Queensland Government in its efforts to conserve threatened species. The report clearly outlines failures in both the effectiveness and efficiency of current systems to achieve the objectives that the Government has set.

The report makes only one passing reference to the role of fungi in the environment and that reference is to the dangers to the flora posed by myrtle rust. As amateur mycologists we are aware that fungi are critical to the health of the plant and animal communities reviewed in this report. But we also know that fungi are neither plants nor animals and we clearly need to renew our efforts to persuade others.

Queensland has some spectacular fungal species that occur nowhere else in Australia or the wider world. They deserve to be protected in their own right, alongside plants and animals. Considering the conservation of fungi as a distinct aspect of the threatened species agenda will improve the chances of success in protecting threatened plant and animal species, because of their crucial role in maintaining healthy ecological communities.

The project to implement the Common Assessment Framework under the Memorandum of Understanding is very welcome but it must distinguish clearly between those species that have viable and secure populations, 'least concern' in IUCN terms and those that have not been assessed, 'not assessed' in the IUCN's terms. Including the 'not assessed' category would give a much clearer measure of the task ahead.

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## Some additional Comments

### David Holdom

This article raises some important issues regarding conservation of threatened species in Queensland. While some plant and animal species have received attention, many others, including the fungi, have not.

In spite of their critical role in ecosystem health, fungi are severely neglected. Much of the mycological research that is conducted is economic mycology, but as an applied scientist working on fungal pathogens of plants and insects, I am acutely aware of the need for basic research in fungal systematics (sadly neglected) and ecology as a foundation for that work. There are dedicated mycologists doing great work in Queensland, but too few of them.

I was disturbed to see the use of the term "least concern" where in fact assessments have not been done or data are lacking. It is critical that classifications accurately reflect the true state of knowledge or the whole process risks losing credibility. It is impossible to assess every species and judgements have to be made by experts as to where to focus scarce resources, but "least concern" implies assessment. "Insufficient data" or "not assessed" are more appropriate terms.

Another related issue that has occurred to me might be termed "co-extinction", a topic covered on the ABC Radio National programme "Late Night Live" on

Monitoring of wildlife to assess populations and trends is virtually non-existent as the QAO report confirms. Coordination between the DES and citizen scientists is poor; greater transparency on the part of DES would greatly help. Currently the main interaction relates to citizen scientists obtaining permits to collect parts of fungi for identification purposes. The permit system only covers a small part of the conservation estate; that is national parks where there is no native title involved. As the QAO report indicates, remnant vegetation is being cleared rapidly and there is no monitoring of the effects of this on fungal diversity. Such monitoring as does occur covers about 2% of Queensland and is restricted to the best protected sites, resulting in a very skewed view of what is happening to fungal species.

The revision of the Nature Conservation (Wildlife) Regulation 2006 is to be welcomed. It will provide an opportunity to clarify that Fungi are a separate kingdom. The Minister should seize this opportunity.

If you care about fungi and their role in our ecosystems and if you want the next generation to have the opportunity to experience this unique and productive part of our natural world, then it is time to write to the Minister and tell your MP that their policies need to take account of the role of fungi.

December 5. No mention of fungi, but highly relevant just the same. Species are interdependent so that often it will be groups that are endangered. There is great work being done, such as Susan Nuske's work showing the importance of fungi in the diet of the northern bettong, but not enough.

That work requires a lot of resources, however, and with many groups competing for a limited government budget, we can hope for, but not realistically expect large increases in funding. So the dedicated public servants responsible have to do the best they can with the resources they have. But we really do need much more data on so many species.

<https://www.abc.net.au/radionational/programs/latenightlive/extinction-domino-effect/10576986>

I also have problems with "offsets". Carbon offsets e.g. by planting forests, have huge potential value when done right, but sadly there are too many reports that many are not. Some good results can also be achieved outside the context of carbon abatement as in this story:

<https://www.theguardian.com/environment/2018/dec/14/reforesting-world-australian-farmer-240m-trees>.

But how do you provide an "offset" for essential habitat for an endangered species? Restoring degraded habitat to allow the species to return is vital, but needs a lot of time, resources and expertise. It also needs to be completed before the area being "offset" is damaged. Creating "new" habitat could be

valuable, but what other species would lose out and do we have any idea of how to do it anyway? Competing interests, population pressures and climate change mean we will likely lose species, and skilful implementation strategies such as these will be essential to minimise that.

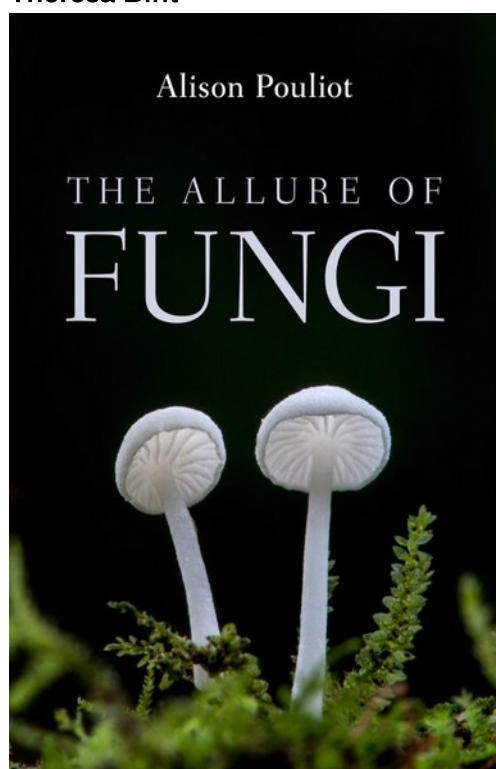
Finally, it must be pointed out that DES was only created recently, and that there have been a number of restructurings of government departments covering scientific and environmental matters in recent years, some associated with funding cuts and even hostility toward conservation work. Even “benign” changes intended to improve performance are disruptive as reporting structures and responsibilities change. While that is happening it can be very difficult for staff

## Review

### The Allure of Fungi, by Alison Pouliot.

Paperback | September 2018 | \$ 49.99  
CSIRO Publishing ISBN: 9781486308576

Theresa Bint



Why are fungi regarded so differently from other forms of life? That's a very interesting question! Alison Pouliot set out to find the answers: this is the story of 1000 days in the forest, on that quest. The result is a vivid and compelling ethnomycological account: a collection of impressions and anecdotes from all kinds of fungi folk and the fungi they encounter.

as budgets and priorities get realigned, and that takes time. So the report in fact will reflect several departmental structures over a number of years and barely if at all the current DES, which has not had time to fulfil the outlined obligations. Those who have followed Queensland politics in recent years will be aware of significant hostility to aspects of environmental protection in some quarters. It has also been suggested to me that some of the data in the report are incorrect and may reflect lack of consultation with relevant specialists. I would not expect auditors to be familiar with the complexities of environmental protection, and they likely had to work under time and resource pressures. In my view the dedication of the public servants tasked with doing the work “on the ground” is beyond question.

Do we need to understand the way fungi are understood and valued? Well, yes – the way we think about fungi feeds directly into what we protect and conserve, where the funding goes and whether there is employment for mycologists! Most importantly, cultural attitudes affect how we can share knowledge of fungi, connectedness and ecosystems.

This book is a celebration of fungi but is as much about people as about mushrooms and lichens. While looking at the glorious and curious in the mycological world – not least via some spectacular photography – the author explores the connections and interactions, the linguistic limitations and nuances, the cultural connections and phobias that shape the human-fungi relationship. Alison's interactions with the mycologists, ecologists, farmers, foragers, custodians and conservationists bring her and us a little closer to understanding these complex relationships.

“...I sought fungi and fungal folk across the Swiss Alps, dropping down into the northern Italian larch and chestnut forests; across to ancient oaks in the French Jura; along the Turkish Turquoise Coast, over to England's Yorkshire Moors and Scotland's windswept Hebridean islands; and among the lichen-speckled boulders of the Swedish High Coast.”

There's a stalked puffball in the outback, a 'Disco in a cow pat', a colony of tiny *Lanzia echinophila* on a chestnut husk, wood hedgehog fungi in the forest in the Jura mountain range and saffron milk caps in Victoria's Central Highlands. Read of inkcaps in Upsalla and sharing Schnapps with Swiss mycologists after a winter evening deliberating dung-loving Ascomycetes. Fungi-filled adventures!

Throughout, Alison speaks for the understanding of ecology and nature that comes from a sensory connection: using smell, touch, hearing and taste.

A beautifully illustrated, thought-provoking book about fungi, conservation and connectedness.