

Dear AMS Community,

I'm sure you're with me when I say that I can't believe how fast this year has gone. With all the delays and cancellations over the past few years, it's almost like we're trying to make up for lost time. I certainly feel that the AMS is doing just that! 2022 has been a successful one for the Society, which was summarized in the President's Report at last month's AGM. We've managed to fit a whole lot in to 2022 and are standing by for even more excitement to come.

AMS will be holding one final virtual seminar for 2022, on Wednesday 26<sup>th</sup> October. There won't be a seminar in November because we are then rounding off the year with our long-awaited 2022 AMS Symposium on 25<sup>th</sup> November in Wellington, New Zealand. You'll find some news, updates and reminders about the symposium below.

Our Research Highlight for this month is on a unique and somewhat understudied niche in mycology featuring Dr Sally Fryar describing her work with marine fungi.

Warm regards,

**Dr Tracey Steinrucken**  
**Australasian Mycological Society President**

Website: <https://www.australasianmycologicalsociety.com>

Facebook: [Australasian Mycological Society](#) and Twitter: [@ausmysoc](#)

## AMS Virtual Seminar: October

**Wednesday 26 October at 12:00pm AEDT**

### **Bacterial endosymbionts in the Mucoromycota fungi, lessons from comparative genomics**



**Dr Jessie Uehling,**  
Assistant Professor of  
Fungal Biology in the  
Department of Botany  
& Plant Pathology at  
**Oregon State  
University.**

*Jessie completed her Bachelors in Botany and Masters in Mycology studying tropical ectomycorrhizal fungal diversity at Humboldt State University before transitioning to Duke University for her PhD research. There she pioneered some of the earliest studies of fungal endosymbionts.*

*At the University of California at San Francisco she learned to use computational population genomics to study a human fungal pathogen,*

*Coccidioides. She uses all these skills in her current lab at OSU, studying fungal endosymbionts with evolutionary, comparative and population genomics.*

Mucoromycota fungi, including both human fungal pathogens and environmental isolates, have ancient and intimate associations with bacterial endosymbionts. In particular, *Burkholderia* related bacteria have been studied in plant associated Mucoromycota fungi including *Mortierella*, *Rhizopus* and relatives.

Comparative and evolutionary genomics show that these symbioses impact genome evolution, physiology and functioning of both partners and rely on trade of primary and secondary metabolites and use of secretion systems. Endosymbiont presence in Mucoromycota fungi strongly impacts fungal transcriptional regulation, metabolism, cell wall composition, and the expression of transmembrane sensors. In this presentation, I will discuss ubiquity, diversity, and

functioning of fungal endosymbionts and recent key findings from our lab.

**To register your attendance at our virtual seminars, visit our website:**

<https://www.australasianmycologicalsociety.com/virtual-seminars-2022>

## Annual General Meeting 2022

The 2022 AGM kicked off with a thought-provoking talk by Professor Roger Shivas on the urgent need to speed up the identification of fungal life on our planet. Following on, our Vice President, Bevan Weir chaired the AGM which touched on the year's highlights, announcements, reports and prospects. I'll summarise some of the main points here and you can read the full minutes and President's report, including the society's financial details on our [website](#).

### AMS Council Members

All AMS Council members nominated to stay on for another year and were thus re-elected:

President: Dr Tracey Steinrucken  
Vice President: Dr Bevan Weir  
Treasurer: Dr Jordan Bailey  
Secretary: Dr Johanna Wong  
Councillor: Dr Anna Hopkins  
Councillor: Jonathan Plett

AMS student representative Australia: Ms Christina Stephenson

We have one open position as New Zealand student Representative.

Any undergrad or postgrad students at a NZ institution are encouraged to **get in touch** if you're interested to be involved.

### Memberships

As of the date of the AGM, we had 94 active members including students associated with Lab Memberships. This year alone, we had 76 Memberships added or renewed. Thanks to Philip Jacobson for his sustaining membership and David and Pamela Catcheside for their ongoing support of research awards.

### Virtual Seminar Series

This year we had people logging in from all over the world including Australia and New Zealand but also United States, United Kingdom, South Africa, China, Canada, and for

the first time New Caledonia, Brazil, and Antigua and Barbuda. Our talks, including those from 2021, have been uploaded to our [YouTube Channel](#)

For 2023 we hope to emphasise the breadth of our society to cover all fungi and fungal-like organisms (such as Oomycetes and Myxomycetes), but also an array of research fields including medical, biotech, chemical, ecological, applied and field mycology. As with this year we also like to feature storytellers too, but we're also open to students presenting new research and we're actively searching for those with Indigenous Knowledge of Mycology.

### Social media

On social media we have surpassed the milestones of 1000 followers on Twitter. A seemingly insignificant achievement, but in fact our visibility means that when we advertise events or share research, we can reach 10s of thousands of Twitter users. On Facebook we have over 1,900 Followers. We try to ensure all our news is shared across both platforms.

We have a YouTube Channel to which all our Seminars are uploaded. We have a small presence on LinkedIn, so feel free to join that group there, and there's even been a bit of talk about starting an Instagram page.

**Please send through or tag us** in anything fungi-related that you would like to share more widely.

### AMS Subcommittee in Fungal Education

The AMS Education subcommittee this year is on hiatus. We get quite a few enquiries from people wanting to study mycology and the resources that the Fungal Education Subcommittee has compiled in the past have been invaluable.

**Please let us know if you'd like to join or nominate someone for the subcommittee** – we're particularly seeking involvement from anyone based in the university system.

### AMS subcommittee in Fungal Conservation

This subcommittee is co-chaired by Tom May and Peter Buchanan of the Australasian Fungi Conservation Group (AFCG). Tom presented their report on the group's recent activities. If you would like to become involved with the AFCG, contact Tom via the AMS website

## Research Highlight

### Freshwater and marine fungi of Australia

by Dr Sally Fryar,  
Honorary Senior  
Research Fellow,  
Flinders University



*Dr. Sally Fryar's mission is to document and describe the freshwater and marine fungi of Australia. During her PhD she studied the complex interactions between wood decay basidiomycetes. Her honours work was on the fascinating specialist fungi that grow on kangaroo dung. She first encountered marine and freshwater fungi in Borneo, while she was a postdoctoral fellow with Prof Kevin Hyde at the University of Hong Kong. It was during this time, while trying to conduct ecological experiments that she realised that we still have an enormous amount of work to do on the taxonomy of most fungi. She now describes new taxa and determine the distribution and abundance of microfungi around Australia, mostly marine and freshwater fungi.*

#### What are freshwater and marine fungi?

Freshwater and marine fungi are fungi that undergo all or part of their lifecycle submerged in either fresh or saline water. They are most commonly saprophytes which are essential in decomposing both autochthonous and allochthonous dead organic material such as wood, leaves, stems, and animal parts. However, plant pathogenic fungi, lichens, mycorrhizae, and endophytes are also abundant in aquatic systems.

Most aquatic fungi are ascomycetes in the Sordariomycetes and Dothideomycetes. They can reproduce either sexually, as perithecia or pseudothecia, or asexually as delicate hyphomycetes or, the at times tricky to identify, coelomycetes. Apothecia are rare, particularly in marine habitats, but are sometimes encountered as with a new genus, *Annabella*, which we recently found in the Saint Kilda mangroves near Adelaide (Fryar et al. 2019).

Most marine fungi only grow and reproduce in marine habitats. Some, such as *Aniptodera chesapeakeensis*, are found in both marine and

fresh water. Freshwater fungi appear to be adapted for that habitat, and only occur in fresh water, but some are also found in terrestrial habitats.

Aquatic fungi frequently have spores with appendages or mucilage as an adaptation to life in water. They may have 4 prongs as in *Tetracladium marchalianum* to stop them from tumbling down a stream, long unfurling bipolar thread-like appendages as in *Halosarpheia fibrosa* to help them to stick to substrates, or sticky pads or appendages as in *Saagaromyces abbonis* which can assist in adhesion.

#### How many species are there?

Currently there are 278 freshwater fungi recorded in Australia, and 132 marine fungi (not including the entomopathogenic fungi, chytrids, lichens, rusts, or smuts). However, this is a fraction of the species that are present in Australia. Most aquatic habitats and substrates in Australia have not been sampled. In new collections from fresh water around 50-60% of species are undescribed. Marine fungi tend to be more cosmopolitan and less diverse, yet new taxa are frequently encountered (for example, Fryar et al. 2020).



*Saagaromyces abbonis* ascospore

#### How do you identify aquatic fungi?

Unfortunately, there are no recent books or monographs for the identification of these species. It is essential to keep up to date with the literature and refer to individual descriptions of species. I have assembled a database of 2487 freshwater and 651 marine fungal descriptions to assist with identification.

### Future research

My goal is to describe and map the freshwater and marine fungi of Australia. This can be done with a combination of techniques. For thorough descriptions and species delimitation it is ideal to observe the sexual or asexual reproductive structures (preferably both), culture the specimen, extract DNA and sequence at least three phylogenetically informative genes. To assist with determining the distribution of each species, DNA metabarcoding techniques will be useful.



*Halosarpheia fibrosa* ascospore

### Further information

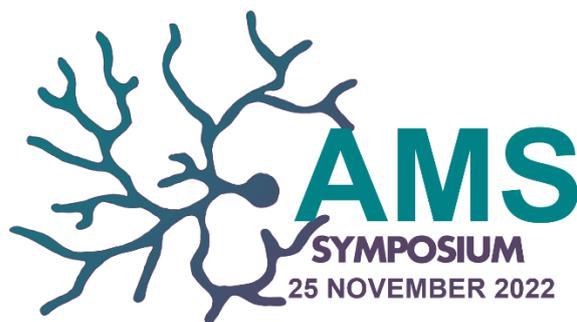
To learn more about aquatic fungi you can listen to a recent podcast episode that I did with my colleague Prof. Allison Walker from Acadia University, Canada while she was visiting on sabbatical. We chatted with the wonderful Dr Ann Jones from the ABC on her radio program and podcast [What the Duck](#).

I have recently launched a [website on the freshwater and marine fungi of Australia](#). So far, the main content is checklists of the freshwater and marine fungi in Australia. The intention is to keep these lists up to date and add descriptions and images of each of species to make them more accessible to other scientists.

### References

Fryar SC, Haelewaters D, Catcheside DEA. 2019. *Annabella australiensis* gen. & sp. nov. (Helotiales, Cordieritidaceae) from South Australian mangroves. *Mycological Progress* 18:973–981.

Fryar SC, Hyde KD, Catcheside DEA. 2020. A survey of marine fungi on wood in South Australia. *Botanica Marina* 63:469–478.



The countdown to **AMS2022 is on!** This time next month we will be joining the New Zealand Microbiological Society (NZMS) and the Fungal Network of New Zealand (FUNNZ) in Wellington. Our symposium will be held as a satellite meeting on **25 November (Friday)** after the main NZMS conference which runs at the same venue earlier in the week.

We have some updated information, announcements, and reminders for those attending, those still considering joining us, and those who will be living vicariously through us!

### AMS2022 Information Bites

- Recent registration numbers indicate a potential record for the AMS meeting with over 150 attendees comprising AMS and FUNNZ members!
- The field trip to Zeelandia, the world's first fully fenced urban ecosanctuary, on the 24<sup>th</sup> is already sold out!
- AMS Members will be getting together for **dinner** on the night of the 25<sup>th</sup>. [Please fill in this survey if you want to join](#). Costs and venue to be confirmed based on numbers attending, so let us know soon.
- Bring along an item for the Fungal Curiosities Silent Auction. More info on next page

### Student Travel Grant Awardees

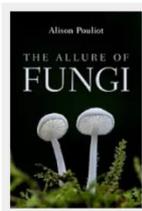
Firstly, we'd like to announce the awardees of the 2022 AMS Student Travel Grant. These grants are worth AU\$250.00 each as part of the Dr Jack Warcup Memorial Prize. Applicants are all AMS student members (undergrad or postgrad) and the awarded funds go towards supporting students to attend AMS2022 via travel expenses such as flights and accommodation.

We're excited to award these to **Aindreeya Alcova** and **Weixia Wang** from the University of Melbourne and **Eloise Martin** from the

University of Queensland! We can't wait to hear about their research next month. Thank-you to Pam and David Catcheside for supporting this award.

### Program of Speakers

We will begin our symposium by our plenary talk by the incredible **Dr Alison Pouliot**. Her work spans both northern and southern hemispheres ensuring two autumns and a double dose of fungi each year. Alison is author of *The Allure of Fungi*, co-author (with Tom May) of *Wild Mushrooming*, and her new book on fungi will be published in March 2023. [www.alisonpouliot.com](http://www.alisonpouliot.com)



Following the plenary talk, we have a jam-packed schedule with the program being finalised and emailed out in the next couple of weeks.

AMS posters will be displayed on the Wednesday of the NZMS conference and will be judged alongside the other NZMS poster submissions, but any submissions from AMS delegates will be displayed again at our Friday Symposium.

As is traditional, we also have an additional AU\$250.00 for the **Dr Jack Warcup Memorial Prize** to award the best student talk at the AMS Symposium (for students presenting on 25 November), which will be awarded at the closing ceremony.

### Fungal Curiosities Silent Auction

For the first time, AMS will be hosting a silent auction throughout the Symposium. We're asking attendees to keep an eye out for mycology-themed items to bring along with you to Wellington. These will be on display through the course of the day with opportunities to bid for your favourite object to take home with you at the end of the day. All money raised from the silent auction will go towards funding research and networking opportunities for Australian and New Zealand Mycologists in 2023.

*Need some inspiration?* Think new items or vintage collectables: *Agaricus* earrings, vintage mushroom ID books, crocheted morels, mycelium magnets... really, anything mycologists would appreciate, but that is also **biosecurity-friendly** for international travel!



**Please check out the conference website for more information:**

<https://www.microbiologyconference.org.nz>

### We are calling for illustration and photograph submissions for the AMS merch store!



Do you have some awesome illustration that you would like to share? Or maybe an incredible photograph of a mysterious mushroom? We want you to contribute your 'fungi art' to our shop!

All proceeds of our shop will contribute to research grants and networking activities for mycological researchers in Aus & NZ.

You can already get T-shirts, jumpers, stickers, pins, or tote bags like this from our shop featuring Jordan Bailey's "Mushroom basket".

Submit your artwork to: [ausmysoc@gmail.com](mailto:ausmysoc@gmail.com)

To support our society, check out our products here at the RedBubble [AusMycSocShop](https://www.redbubble.com/AusMycSocShop)

## Upcoming Mycology Events

### Australian Microbial Ecology Conference (AusME 2022)

**7-9 November 2022** | [Website](#) | Melbourne

AusME is an in-person conference in Australia which is dedicated to microbial ecological research. There will be six main sessions: Terrestrial Microbiology, Aquatic Microbiology, Human Microbiology, Industrial and Food Microbiology, Symbiosis, and the Microbial Toolbox.

### Microbes Rule! NZ Microbiological Society Annual Conference & AMS Symposium

**21-25 November 2022** | [Website](#) | Te Whanganui-a-Tara/Wellington New Zealand

This year sees the New Zealand Microbiology Society return to Pipitea Campus, Victoria University of Wellington, Te Whanganui-a-Tara/Wellington for the first face-to-face conference since 2019. Science, and in particular microbiology, has never had the exposure that it has had over the last two years. I reckon that everyone in New Zealand (and probably the world) now knows about viruses, vaccines, epidemiology, and the importance of genomic sequencing, whether they wanted to or not. What an amazing time to be a microbiologist! The AMS (us!) will be holding a satellite meeting on the final day of the conference.

### The 3<sup>rd</sup> Global Soil Biodiversity Conference

**13 – 15 March 2023** | [Website](#) | Dublin, Ireland

The 3rd Global Soil Biodiversity Conference to be held in Dublin (Ireland) in 2023 will expand on previous GSBI conferences and convene the world's leading experts in this interdisciplinary field of soil biodiversity science to present and discuss recent advances addressing the urgency of meeting global challenges which link to human, animal and plant health and a more sustainable world.

### 12th International Congress of Plant Pathology

**20-25 August 2023** | [Website](#) | Lyon, France

Plant pathologists and plant health researchers from around the world will meet to discuss their latest research as well as current and future issues facing plant health experts. The theme for the congress is, "One Health for all plants, crops and trees" and will consider the integral nature of plant health with human, animal and environmental health. In addition to an excellent program of keynote talks, concurrent sessions, poster presentations, and networking opportunities, there will be several satellite events before the meeting dates to provide opportunities for deeper discussions into several topics.

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If you have anything you'd like to contribute to the next edition of the AMS Newsletter, or if you would like to have your research or event featured, please contact our Secretary Johanna ([ausmycsoc@gmail.com](mailto:ausmycsoc@gmail.com)) or myself ([ausmycsoc.president@gmail.com](mailto:ausmycsoc.president@gmail.com)). We're after content highlighting your latest research, profiles on mycologists from your network, mycological events and news, career and scholarship opportunities, and photos or artwork of new or interesting fungal species.

We hope you enjoyed the October 2022 edition of the AMS Newsletter.

**Dr Tracey Steinrucken**  
AMS President

