

Dear AMS Community,

I have just come from enjoying a mug of tea while appreciating the crisp autumn air. It really is one of the best times of the year as a mycologist – sporing bodies popping up everywhere in all their beautiful colour and diversity. I hope that you all get a chance to get out into nature and see what is in your local area! In this edition of the AMS newsletter we have updates on the AMS education subcommittee, we have some glorious photos of macrofungi, and we have an update on research from one of our previous AMS research award winners. We also announce our next round of research awards, so please consider applying.

Happy reading,

**Associate Prof. Jonathan Plett**  
**Australasian Mycological Society President**

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

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## 2023 AMS Members Pin!

As we started last year, we will be producing an annual AMS Members Pin. The 2023 pin (below) was designed by Dr Jordan Bailey using the AMS logo and sent out to all members.

The 75th meeting of the United Nations (UN) General Assembly chose this year as the Year of the Millets. With a history of over 8,000 years of human consumption, millets serve as an important source of nutrition for millions

of people as well as for our livestock. Due to their stress tolerance, this resilient crop is being promoted by the UN as a valuable ally in the fight against world hunger. However, like all plants, millets are attacked by a range of pathogens. This year's pin focuses our attention on two of these: *Sclerospora graminicola* and *Puccinia substriata* var. *indica*. In our support of the UN sustainability goals, let us as a community support research in fighting these diseases!



## AMS Mycology Education Subcommittee



We are pleased to announce that the new Chair the AMS Education Subcommittee is Dr. Sarah Sapsford (DECRA Fellow; Murdoch University). The subcommittee has a primary focus on countering the decline in mycological education in schools and universities across Australasia. The Subcommittee [webpage](#) includes several resources to which we often direct enquiries from members of the public looking to study mycology.

Current members of the subcommittee included: Susan Nuske (James Cook University), Dee Carter (University of Sydney), John Dearnaley (University of Southern Queensland), Jonathan Plett (Western Sydney University), Sapphire McMullan Fisher (Fungimap), Anna Hopkins (Edith Cowan University).

If you would like to join the committee, please contact Sarah. We believe those with a role in Academia (including ECRs and PhD students) are suited to involvement in this project as they'd have a unique insight into the tertiary education system in Australia and/or New Zealand and networking opportunities to match. If you're interested, **please get in touch**.

## Mushrooms, mushrooms everywhere!

Dr. Tess McBride, a postdoctoral research fellow working at the Hawkesbury Institute for the Environment at Western Sydney University, is an avid sleuth searching for sporing bodies of macrofungi. While her honours and PhD research related to phage-host interactions (University of Otago), she was first struck by how incredible fungi are over a long weekend at Hanmer Springs when she found herself in a forest surrounded by multitudes of fungi. From there she spent her free time learning how to identify fungi, and soon autumn became her favourite time of the year. Her enthusiasm led to a short-term job foraging for native NZ fungi, although she comments that it certainly did not feel like work when she was wandering around the forest searching for mushrooms!! She has since combined her love of fungi with her previous laboratory experience into her postdoctoral research where she studies the ectomycorrhizal fungi *Pisolithus microcarpus*. She





stills spends a lot of her free time finding and trying to identify fungi and says that "at this point, mushrooms have become part of my personality." Some of her beautiful pictures are below. For more, look her up on Instagram (@fungi\_phile).





# Australasian Mycological Society

## 2023 RESEARCH GRANTS

The Australasian Mycological Society (AMS) aims to promote the understanding of fungi, and a key component of this aim is to support research activities by Australasian mycologists. Applications for the 2023 AMS Research Grant are welcomed from all current financial members of the AMS, especially junior members. The project must be carried out within Australasia and the applicant must be associated with an Australasian research organisation. Successful applicants are asked to present the outcomes of their research at the AMS conference immediately following their award.

**Up to two grants will be awarded in 2023, each with a maximum value of \$2000. One of the two grants will be prioritised for applicants who are junior members (Higher Degree Research students or recent PhD graduates). The second grant will be open to any member, regardless of career stage. Aboriginal and Torres Strait Islander people are also strongly encouraged to apply.**

The grant may be used for expenses directly related to research activities which must commence in 2023. Requests for contributions to large capital items or conference travel will not be considered, nor will applications explicitly targeting a training opportunity (see the 'AMS Training Grant' in the latter case). All applications will be judged on (i) scientific merit and (ii) the extent that the award will enhance output(s) of the awardee's research program.

Current members of the AMS council are ineligible for an award.

### **Application requirements:**

- Your full name, affiliation, position and contact details
- Your eligibility for consideration as an ECR (Higher Degree Research students or recent PhD graduates  $\leq 5$  years post award)
- Please indicate that you are a current financial member of the AMS or that you have confirmed with your (co-)supervisor that they have an AMS lab group membership in which you are included ([to join, click here](#)).
- The application must briefly indicate how the project will contribute to the aims of the AMS; detail the reasons for the project; outline the aim(s) and include descriptions of the research activities, expected outcomes and qualifications of the researcher (maximum 3 pages).
- A budget for the grant is also required, including justification for each item of expenditure (maximum 1 page). You can apply for \$1000 to \$2000 in funding.
- The text must be in 12-point font of a common style (e.g., Times New Roman, Calibri or Arial).
- Applications longer than four pages will not be accepted.



A PDF application should be emailed to the AMS secretary Johanna Wong, ([ausmysoc@gmail.com](mailto:ausmysoc@gmail.com)) by Friday the 26<sup>th</sup> May, 2023. Enquiries can also be directed to Johanna. The successful applicant will be announced by 16<sup>th</sup> June.

### **Important dates**

Grants Open	Monday 17 <sup>th</sup> April, 2023
Application Deadline	Friday 26 <sup>th</sup> May, 2023 5:00pm AEST
Successful Applicants Advised	Friday 16 <sup>th</sup> June, 2023
Funds Available from	Monday 3 <sup>rd</sup> July, 2023

We acknowledge the generous contributions of our members and the financial supporters of the Australasian Mycological Society, which have made this grant possible.





## Understanding the diversity, biology and biogeography of Native Australian Seed Fungi for improving restoration and *ex-situ* conservation outcomes



Allison Mertin is a current PhD Candidate in Microbial Ecology at the University of Melbourne and The Royal Botanic Gardens, Sydney. She was awarded the Australasian Mycological Society's Research Grant 2022. Allison's research is supervised by Professor Linda Blackall and Dr Douglas Brumley (University of Melbourne) with external supervisors Dr. Edward Liew and Dr. Marlien van Der Merwe (Research Centre for Ecosystem Resilience, RBGS, Sydney).

The need for restoration of degraded ecosystems within Australia is increasing rapidly. As seedling establishment within grassland restoration projects can be as low as 10% it is crucial to investigate novel ways in which rates of plant growth can be increased at these degraded sites. As many grasslands are revegetated using seed rather than seedlings, seed presents an avenue to facilitate this. Seed fungal endophytes are microscopic fungi that are present within the living tissue of seed. They are dispersed with the plant seed and already are present at the first developmental stages of the new seedling. Seed fungal endophytes therefore may form the primary inoculum for the initial plant

mycobiome, having the capability to colonise the emerging seedlings with potential impacts on plant fitness. Research on agricultural plants have highlighted important functional roles of seed fungal endophytes but yet the diversity, biology and ecology of fungi of seed are least known of all the plant organs studies of Australian natural ecosystem hosts limited.

Knowledge of the plant growth promotion of fungal seed endophytes of seed is less well known compared to the knowledge of their pathogenic potential. Fungal endophytes have been associated with numerous functions – e.g., in grass seed with reducing seed predation and promoting germination and seedling establishment. Microbial species for inoculation trials using native plant species within a restoration context are usually isolated from the rhizosphere, from biocrusts or are mycorrhizal species. Seed-sourced microbes may be better inoculants due their importance to the early stages of the plant, and their ability to withstand changes during seedling emergence and translocation to the roots and surrounding soil.



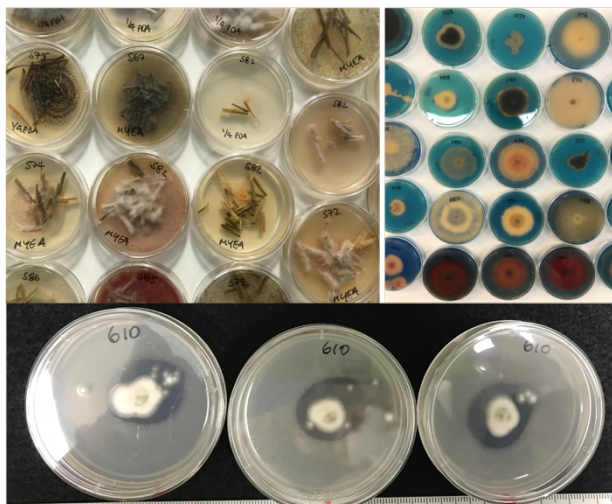
**Figure 1:** Allison collecting seed from (left) threatened *Themeda* grasslands (middle) *Melaleuca* swamp ecosystems and (right) restored *Themeda* Grasslands along the east coast of New South Wales and into the ACT.

My research aims to increase our knowledge of the unexplored diversity of fungal endophytes of native Australian seed, with applications to restoration and *ex situ* conservation. Specifically, I am investigating the diversity, ecology and biogeography of the endophytic fungi and bacteria within seeds of the grasses *Themeda triandra* (Kangaroo Grass), *Microlaena stipoides* (Weeping Grass) and the tree *Melaleuca quinquenervia* (Paperbark), as they are frequently used in restoration projects. Understanding what microbes are present and their role within their host plant will inform how seed is stored in seed banks for restoration and provide opportunities to utilise these microbes in field-based restoration.

At the start of my PhD, I collected seed from 52 sites where these three species occur along the eastern coast of New South Wales and within the Monaro and Western Tablelands regions. The collection regions included endangered ecological communities within national parks and reserves, and sites that have been restored using either local seed or seed from seed banks. I have undertaken metabarcoding of the ITS2 and 16S regions for these seed samples, and also from seed banks and commercial suppliers. These datasets will allow for

me to compare the seed microbial communities between the three host species and between the restored and natural sites. The sampling will also allow for me to identify biogeography patterns occurring at a landscape scale. I will also address changes in the seed microbiome with the different seed storage and processing methods.

From the surface sterilised seed samples, I have also isolated and pure cultured over 500 fungal isolates and identified them using Sanger sequencing and phylogenetics. Currently I am undertaking phenotyping assays to understand their plant growth promotion potential. I am testing the isolates to determine whether they can produce indole-3-acetic acid, 1-aminocyclopropane-1-carboxylate deaminase, siderophores, and whether they can solubilise phosphate or phytate. These microbial traits are of interest as they associated with improving access to nutrients for the host plant and improving root growth, which may be of benefit to seeds planted in degraded sites. We are hoping to do some inoculation trials later this year with isolates that show promising results in the phenotyping tests. I am looking forward to sharing some of these results with the Society in a seminar later in the year.



**Figure 2:** Some fungal isolates on Carnation Leaf Agar from *T. triandra* and *M. stipoides* seed (left) testing for the production of siderophores by the isolates using a modified overlay CAS medium (middle) and (right) testing for the ability to solubilise phosphorus in the form of calcium phytate on Phytate Solubilising Medium.



## Virtual Seminar Series 2023

We continue to hear from a variety of engaging speakers on a wide range of fungal topics. This month we have the pleasure of hearing from Prof. Bernard Slippers. Please note the altered time for this month only due to the time difference with South Africa.

### 3PM AEST on 26 April – Prof. Bernard Slippers

Forestry and Agricultural Biotechnology Institute (FABI), University of Pretoria

#### ***Ecology and evolution of the *Sirex noctilio* – *Amylostereum areolatum* symbiosis, and its relevance to biological control***

Siricidae woodwasps live in an obligate, mutualistic relationship with fungi in the genus *Amylostereum*. Asexually produced fungal fragments are carried in specialised mycangia and introduced into wood of conifer species during oviposition. Here the developing fungi predigest the woody substrate before ingestion by the larvae. The best known of these wasps and fungi are *Sirex noctilio* and its symbiotic fungus, *Amylostereum areolatum*, which have become important invasive pests of *Pinus* trees in various parts of the world. The invasion by these organisms outside its European native range started more than a hundred years ago in New Zealand, followed by Australia in the 1950's. The invasion process continues to this day in countries in the northern and southern hemispheres. A highly specific parasitic nematode, *Deladenus siricidicola*, that requires both the fungus and wasp to complete its life cycle, was discovered in New Zealand and Australia in the 1950's. This nematode was subsequently developed as a biological control agent that is now used in many part of the world. In this talk I will discuss our systematic study of the interactions of all three these organisms using molecular and culture based tools from collections across their global distribution, including from historical preserved collections. By visualising patterns of invasion and outcomes of the biological control program we highlight ways to improve management of such invasive pests. In the process we also uncover elements of the ecology and phylogeography of the mutualism and parasitism that help us understand the evolution of this fascinating tripartite symbiosis.



**Registration is required. Please visit**

[https://us02web.zoom.us/webinar/register/WN\\_jLIDTiYUS26uyRd-sgl-Jg](https://us02web.zoom.us/webinar/register/WN_jLIDTiYUS26uyRd-sgl-Jg)

Please see our [website](#) for updates: on the upcoming 2023 Seminars. We are also looking for speaker suggestions for the second half of the year, so please contact us if you know someone whose work we should feature. Upcoming seminars include:



### 24 May – Dr Anna Hopkins

Edith Cowan University, Western Australia  
Conservation biology and environmental science

### 28 June – Nominations Welcome

Contact us at [ausmycsoc@gmail.com](mailto:ausmycsoc@gmail.com) if you want to nominate!

### 26 July – Dr. Hagai Shemesh

Tei-Hai College, Tel-Hai, Isreal  
Impact of mycorrhizal fungi on the ecology of trees and shrubs in Mediterranean ecosystems

### 29 November – Allison Martin

2022 AMS Research Grant Awardee  
University of Melbourne, The Royal Botanic Gardens, Sydney  
Understanding the diversity, biology and biogeography of Native Australian Seed Fungi for improving restoration and ex-situ conservation outcomes

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## Upcoming Events

### Australasian Myrtle Rust Conference

21-23 June 2023 | [Website](#) | Sydney, Australia

*Austropuccinia psidii*, causal agent of **myrtle rust**, is a globally dispersed pathogen having devastating impacts in the Australasian region. Collaborative research efforts have improved our understanding of the pathogen and are starting to deliver management tools, while communities are rapidly mobilising to protect and conserve native plants. However, there is an urgent need to do more to prevent extinctions and to strengthen ecosystems.

Join us in Sydney for the Australasian Myrtle Rust Conference to contribute to and learn about the latest research and management approaches. Be part of the conversation as we ask, "where to from here?"

This event will include a poster session and optional field trip to view myrtle rust where it is heavily impacting Australian native plants. Programme outline available and abstract submission now open.

### National Science Week

12-20 Aug 2023 | [Website](#) | Australia

Science Week is a series of science-related events for the general public which are held during a designated week of the year. The aim of science weeks is to engage and inspire people of all ages with science, engineering and technology. If you are interested in getting involved, please visit the national website and follow the links.

## 12th International Congress of Plant Pathology

20-25 Aug 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.

## 24th Australasian Plant Pathology Society Conference

20-24 Nov 2023 | [Website](#) | Adelaide, Australia

The Australasian Plant Pathology Society Conference will be held in Adelaide, South Australia, 20 - 24 November at the National Wine Centre, corner of Botanic & Hackney

Roads, Adelaide, South Australia. For those unable to attend face-to-face a virtual platform housing pre-recorded presentations, poster galley and virtual exhibition will be accessible to all delegates post event for 3 months.

The theme for the conference, "Change and Adaptation", has been chosen to highlight the ever-changing nature of pathogens and the array of emerging technologies being developed to monitor and control disease.

## Australian Society of Plant Scientists Symposium 2023

28 Nov – 1 Dec 2023 | [Website](#) | Hobart, Australia

Save the date for this conference that, while focusing on plant science, will include different sessions that include plant-microbe interaction studies. Sessions including plant nutrition and beneficial plant-microbe interactions, cell walls and defense, stress sensing and signalling will be of interest to our membership.

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### 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: [ausmycsoc@gmail.com](mailto:ausmycsoc@gmail.com)

To support our society, check out our products here at the RedBubble [AusMycSocShop](#)



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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 final AMS Newsletter for 2022 and that you have a safe and relaxing summer break.

**Associate Prof. Jonathan Plett**

AMS President, on behalf of the AMS Council

