AMS Newsletter

16th February 2022

Dear AMS Community,

It seems like just yesterday that we were preparing the December newsletter and wishing you all a happy holiday season! Now, already well into February, the AMS Council has been busy discussing how 2022 will look, and all of the exciting opportunities in mycology in Australasia. This year, regulations allowing, we can look forward to many meetings and conferences that have been postponed over the last two years. The AMS will also be partnering with NZMS to have a conference at the end of the year – please stay tuned for further information in the coming months. The AMS will be continuing with our Virtual Seminars in 2022, and we will be bringing you news about new discoveries and cool fungi spotted across the year. So, make sure your membership is up-to-date so you can continue to take advantage of all these opportunities in 2022. We look forward to continuing ever forward with all of you this year!

Warm regards,
Jonathan Plett
Australasian Mycological Society Councillor
Website: https://www.australasianmycologicalsociety.com/
Facebook: AMSstudents and Twitter: @ausmycsoc

AMS Fungi Portrait – *Crepidotus innuopurpureus* sp. nov.

Sporing bodies of *Crepidotus innuopurpureus* on rainforest tree at Jameson Arch, Western Australia. Photo: Matt Barrett (reproduced with Sporing bodies of *Crepidotus innuopurpureus* on rainforest tree at Jameson Arch, WA.

The north of Australia is relatively unexplored mycologically. Sapphire McMullan-Fisher and colleagues recently described a new species of *Crepidotus* from rainforest in two widely separated localities: the Blackall Range, south-east Queensland and the Jameson Arch, near Mt Agnes, West Kimberley, Western Australia. Sporing bodies of *Crepidotus innuopurpureus* are kidney-shaped and up to 10 mm in radius, growing in troops on wood, including standing living trees, stags or logs.

Microscopically, magenta pigment occurs in the cheilocystidia and elements of the pileipellis, and also as crystalline deposits on the apices of cheilocystidia. Macroscopically, the edge of the lamellae is coloured.

Overall, sporing bodies have pink to lilac tints that disappear with exposure to light. The species is expected to occur more widely across subtropical and tropical areas of Australia.

McMullan-Fisher S, Lebel T, Senn-Irlet B (2021) *Crepidotus innuopurpureus* McMull.-Fish., T. Lebel, Senn-Irlet, sp. nov, Fungal Planet 1344, in Crous et al., Fungal Planet description sheets: 1284–1382, *Persoonia* 47: 178–374. https://doi.org/10.3767/persoonia.2021.47.06

Membership Renewal

RENEW YOUR MEMBERSHIP TODAY!

It's 2022! Renew your membership by visiting:
https://www.australasianmycologicalsociety.com/membership

Access the recorded webinar series, social events, the upcoming conference, and apply for our research grants. Your contribution supports those research grants, fungal conservation efforts and mycology education and students.

Help us support the next generation of mycologists!

Starting this year, you'll also receive the EXCLUSIVE member's pin!
JOIN BEFORE MARCH 31st

Want to check your membership status? Email ausmycsoc.treasurer@gmail.com

AMS Virtual Seminar Series 2022

Drawing from the success of 2021 and the feedback we receive every month from attendees, we have decided to continue the delivery of this series and are now putting out the call to all of you! Our seminars occur generally on the last Wednesday of the month at 12:00pm Sydney time. Talks are 30 minutes long and are followed by 15 minutes of questions from the audience. Please write to Tracey (ausmycsoc.president@gmail.com) if you're interested in presenting.

This month's seminar is on **Wednesday 23rd February at 12pm Sydney time (2pm NZ time)**

Wayne Boatwright, President of the Queensland Mycological Society

"Collecting and Describing Fungi: Citizen Science in Action"

Ever wondered how to find out more about collecting and identifying fungi? Each year the Queensland Mycological Society mentors its members about citizen science by encouraging them to become specimen collectors for and on behalf of Herbaria. Fungal specimens are under-collected but a much-needed resource for future mycological work. Our workshop covers everything you need to know about being a specimen collector, from safety in the field, legal and ethical collecting, through to identifying, processing and describing your specimen before lodging this valuable resource at an Herbarium.

If you're interested in learning how to find, ID, collect and describe fungi, join us to hear Wayne introduce his much-sought-after workshop. This seminar is a perfect taster for a broad audience of fungal enthusiasts including researchers, collectors, farmers, gardeners, citizen scientists, even hikers and students with an eye for natural details

Register here: https://us02web.zoom.us/webinar/register/WN_Lble2uVwQkeD8fYaJSriRA

Untangling the 'Gordian knot' – How to unravel a complex fungal disease of wheat by understanding its game of effector hide-and-seek.

Kar-Chun Tan and Evan John
Centre for Crop and Disease Management, Curtin University, Bentley, Perth, WA, Australia

Fig. 1. Septoria nodorum blotch of wheat caused by *P. nodorum*

Breeding for durable resistance to microbial-borne diseases is a continual challenge for crop breeders as fungal pathogens have developed many ways to overcome host resistance by masking themselves through effector diversification and evasion of broad-spectrum defense responses. Association mapping, which uses populations constructed from your favourite crop that are infected with pathogen mixtures, is frequently used by researchers and pathologists alike to seek out novel sources of genetic resistance and thereby minimise the impact of crop diseases. However, disease resistance quantitative trait loci (QTL) detected through association mapping are often minor and inconsistent across environments. This is a particular problem with septoria diseases of cereals such as septoria nodorum blotch (SNB) of wheat caused by *Parastagonospora nodorum* (Fig. 1).

P. nodorum uses a suite of proteinaceous necrotrophic effectors (NEs) to cause necrosis on wheat carrying a matching dominant susceptibility gene (*Tsn*/*Snn*). Interactions between these NEs are complex during infection. Once thought to quantitatively contribute to SNB, we now know that NEs mask each other's contribution through epistasis, where interactions with *Tsn*/*Snn* suppress the action of others during infection. Alluding to the title, the Gordian Knot has often been used as a metaphoric representation of a difficult problem that can be solved using an unconventional approach. We liken the phenomenon of effector epistasis to the Gordian knot of SNB (Fig. 2). The complexity (and functional redundancy) of this system greatly impedes progress in breeding for SNB resistance in wheat.

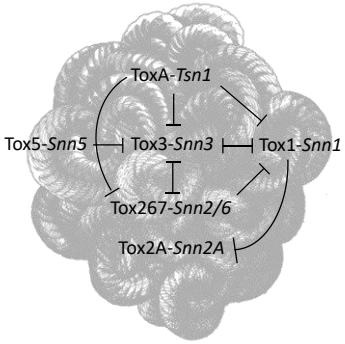

Fig. 2. The 'Gordian Knot' demonstrating complex epistasis between different *P. nodorum* effector (Tox) and wheat susceptibility receptor (*Tsn*/*Snn*) interactions in SNB.

In our study, a genetic element called PE401 was discovered in the promoter of the major NE gene *Tox1* (DOI: 10.1371/journal.ppat.1010149). PE401 functions as a transcriptional repressor of *Tox1* (Fig. 3) and suppresses the contribution of Tox2A-*Snn2A* interaction in SNB (Fig. 2). We also know that *P. nodorum* isolates in Australia generally lacked PE401 and favour the Tox1-*Snn1* interaction in SNB, as opposed to most other wheat-growing regions of the world where endemic *P. nodorum* isolates predominantly harbour PE401 (Fig. 4). In the context of crop protection, we advocate for constant surveillance of the pathogen population for the frequency of PE401 in conjunction with NE frequency. This will enable pathologists and agronomists to provide the best advice to growers on which wheat varieties can provide optimal resistance to SNB based on regional pathogen-population genotypes. So, did we manage to cut the Gordian knot? Not completely, but at least a substantial nick was made where Tox1-*Snn1* is.

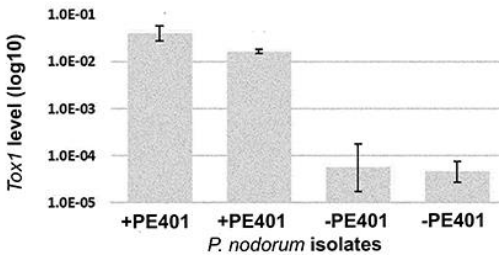

Fig. 3. *Tox1* expression level in four *P. nodorum* isolates with and without the PE401 repressor element. Modified from DOI: 10.1371/journal.ppat.1010149

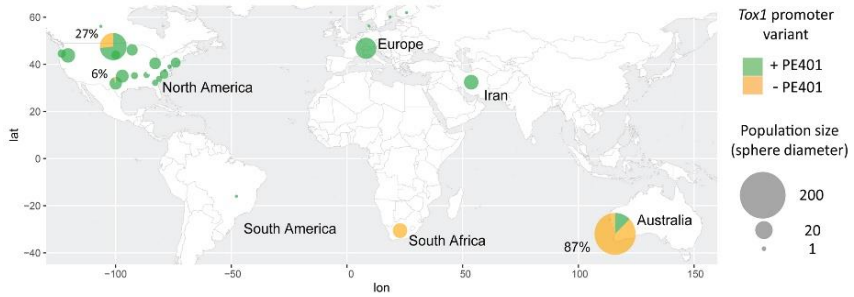

Fig. 4. Distribution of PE401 in the *Tox1* promoter of *P. nodorum* isolates. Adapted from DOI: 10.1371/journal.ppat.1010149.

Big thanks to Kar-Chun (KC) Tan for this research highlight. KC will be presenting more of his research at our May Virtual Seminar. Stay tuned for more details!

Introducing our *New* AMS Treasurer!

We would like to welcome our new treasurer, Dr. Jordan Bailey! Jordan discovered the world of Herbaria as an intern at the National Herbarium in Sydney. Following her degree in Agricultural Science, Jordan undertook postgraduate studies in plant pathology, biosecurity, and diagnostics. She went on to work with herbaria in the USA at Purdue University and the United States Department of Agriculture, National Fungus Collections, focusing on specimen digitization and taxonomy and systematics of fungal pathogens.

Jordan returned to Australia to take on the role of Curator at the NSW Department of Primary Industries (NSW DPI) Plant Pathology & Mycology Herbarium in Orange in 2017. In 2020, Jordan was appointed Director of the NSW DPI Orange Agricultural Institute, a role that aims to promote the work of DPI scientists in Orange.

Research Grants

Australasian Mycological Society Research Grant

After a bit of a COVID-induced hiatus, AMS is proud to be able to re-launch our grant program for 2022!

From the 1st March, applications for the 2022 AMS research awards 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 (citizen scientists can apply for the FungiMap Citizen Science Grant – see below). 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 2022, each with a maximum value of $3000. 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.

We'll be sending out an official research grant launch email on the 1st March, so check your inbox!

Citizen Science Research Grants

Fungimap are putting the finishing touches to a new Research Grant program and will announce a call for applications on **1st March** in collaboration with the Australasian Mycological Society.

You may have uncovered a new species that has never been formally described and you need support for DNA sequencing. You may wish to explore how your local species are changing over time with climate change or land management. You may wish to research First Nations' use and relationship with fungi. Or you may wish to run a workshop for citizen scientists to survey, ID and contribute records to iNaturalist or their local herbarium. We will warmly welcome your ideas to discover more about Australia's macrofungi and how to protect them!

Citizen scientists (or those building citizen science capacity) will be encouraged to apply for a grant to help cover the costs of their Australian native fungi research project. Applicants will have a 6 week period to apply for between $500-$2000 in one of two areas. We encourage you to apply for either a *"Spore Grant"* for new, innovative research, or a *"Strategic Research Grant"* for research focusing on the Fungimap target species, species yet to be formally described, and species which have been formally assessed for the IUCN Red List or need to be formally assessed.

For queries, contact the Fungimap Coordinator at fungimap@gmail.com. Find out more about all Fungimap programs by subscribing to our monthly eNews.

Fungimap gratefully acknowledges the generous support of every individual and organisation who has made our Research Grant possible by donating to Fungimap and our Christmas Appeal

Upcoming Mycology Events – Announcements and Changes

The Great Aussie FungiQuest

Introducing the largest fungi bioblitz in Australia's history, a collaboration between Fungimap and Questagame!

From the 25th February, join this Australia-wide citizen science event on Questagame. You can help us document the distribution of Australia's precious macrofungi, while earning points and moving up the leaderboard for your chance to win prizes!

The event is being run in conjunction with the World Science Festival - Brisbane, where Fungimap will have a stand at Southbank over the weekend of 12-13th March. We are looking for a few volunteers to help out on the stand, so if you can help or for any enquiries about The Great Aussie FungiQuest, please contact fungimap.fungi.count@gmail.com

2022 New Zealand Microbiological Society Annual Conference

With details almost ironed out, the New Zealand Microbiological Society will be holding their annual conference in Wellington New Zealand, in the last week of November.

AMS will soon be announcing details about our annual conference, which we're pleased to say, will be a collaboration with NZMS. More info soon!

Fungal Network of New Zealand (FUNNZ): 2022 Fungal Foray

Website

The 2022 fungal foray will be held at the Dutch Hall in Rotorua from 16th - 20th May, with the colloquium day being at Scion.

Registration will open March 2022.

Australian Biosecurity Symposium

New Dates: 3-5 May 2022 | Website | Gold Coast, Queensland

Animal Health Australia, the Invasive Species Council, the Centre for Invasive Species Solutions and Plant Health Australia are excited to host the 2021 Australian Biosecurity Symposium. This will once again focus on biosecurity prevention and provide the opportunity to share research and innovation, explore outside-of-the-box thinking and exchange knowledge and ideas across the biosecurity collective – agriculture (animals and plants), pest animals, weeds, wildlife, aquatics, humans, and the environment. This year's theme is 'a decade of biosecurity: turning a moment into a movement.'

SES 2022 Biennial Meeting of the Soil Ecology Society

Organisers: Soil Ecology Society, Pacific Northwest National Laboratory

May 17-19, 2022 | Website | Richmond, Washington USA

Join the Soil Ecology Society Biennial Meeting occurring Tuesday-Thursday, May 17-19, 2022. This action-packed event will feature keynote speakers, panel discussions, field trip opportunities, flash talks, poster sessions, laboratory tours, awards, and networking opportunities. The Biennial Meeting is planned as a hybrid event with participation possible both in-person at Pacific Northwest National Laboratory in Richland, Washington and via Zoom. If travel and meeting policies will not allow for an in-person meeting, a decision to shift to an entirely virtual event will be made mid-March. More information will be forthcoming regarding registration and whether there will be a registration fee.

International Conference on Mycorrhiza (ICOM 11)

July 31-August 5, 2022 | Website | Bejing, China

ICOM 11, will cover a broad range of research topics in mycorrhizal research including: taxonomy, diversity, ecology, molecular biology, genomics and transcriptomic, restoration and applied technologies for mycorrhizae. Given the changing global instructions with regards to travel, this conference is likely to be a hybrid online/in-person event. Check website for updates.

Asian Mycology Congress AMC2021

August 3-5 2022 | Website | Pathum Thani, Thailand & Online

It has been more than a decade since the AMC was held in Thailand and we are delighted to host this conference in Pathum Thani. The theme of the congress is Asian Mycology in the 21st century: the new generation, and we will focus on the young generation of mycologists who will be at the forefront of Mycology in the future. The congress will cover a wide range of topics from basic science (taxonomy, ecology, pathology) to the applied aspects (biological control, biotechnology, genomics, metabolomics).

22nd World Congress of Soil Science 2022

Organisers: International Society for Microbial Ecology
31 July – 5 August, 2022 | Website | Glasgow, UK

At a time of global concern for our planet and its growing population, managing our soils sustainably has never been as important. 90% of our food comes from soil, as does all of our timber and other fibre. Soil, and the ecosystems it supports, have a huge role in mitigating against climate change, is a vast reservoir of biodiversity, plays a significant role in flood management and contains key evidence of past civilisations. Our understanding of the importance of these functions is developing rapidly and the Congress provides the ideal setting to discover the international state of the art in these critical global issues and an opportunity to connect across all who work with and rely on soils.

18th International Symposium on Microbial Ecology

14-19 August, 2022 | Website | Lausanne, Switzerland

ISME18 is the 18th edition of our non-profit symposium which takes place every two years. The conference is the front runner in the field of microbial ecology, with an average of around 1,750 international scientists that attend the conference.

If you have anything you'd like to contribute to the next edition, or if you would like to have your research or event featured, please contact our Secretary Johanna Wong (ausmycosoc@gmail.com) or Tracey Steinrucken (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 of new or interesting fungal species.

We hope you enjoyed the February 2022 edition of the AMS Newsletter. Thank-you for your continued support of our society!

Stay Safe and All the best
Jonathan Plett, AMS Councilor