Analysis of Cortinarius in the Adelaide Hills / Wild Webcap

The aim of our research project was to study the distribution of the *Cortinarius* genus across the Adelaide Hills & Southern Mount Lofty Ranges, so that we can develop a greater understanding of their diversity and ecological significance. Engaging the public through identification workshops and teaching people to upload good quality observations to iNaturalist was important to us as we started to get this project off the ground. We wanted to help others to feel confident in their identifications, so that they could contribute to the project – we couldn't possibly catalogue one of the worlds largest genera all on our own!
In July 2023, we hosted a workshop in collaboration with the Adelaide Hills Science Hub, the workshop focused on skill-building to help people recognise, identify, photograph and describe *Cortinarius* and upload their observations to iNaturalist. Participants were given identification sheets to fill in on the foray, we uploaded observations to our iNaturalist project (Wild Webcap) and collected some specimens so we could view spores under the microscope. It was fantastic to see people of all ages and skill levels come along to learn about these beautiful fungi and walk away with the confidence to identify at least a few species from this massive genus.
We chose to focus on 4 sites (Para Wirra CP, Mark Oliphant CP, Hender Reserve and Belair NP) which contained a variety of *Eucalyptus* species (the main mycorrhizal partner in SA), vegetation communities and climatic conditions with the goal to see (over a period of time longer than the scope of this project) to what degree the frequency, diversity and fruiting times of *Cortinarius* varied across these sites. Our 4 target species were *Cortinarius archeri, C. alboviolaceus, C. sinapicolor and C. austrovenetus* as these species are all quite abundant and easy to identify in the field.
Since *Cortinarius* is such a vast genus, with an estimated 2000-3000 species worldwide, it was inevitable that we would come across specimens which we couldn't identify in situ. Over the course of the project, we made many collections not only of our target species, but also of many species which we were not familiar with. One highlight was finding and confirming via DNA analysis, the first fruit body (as far as we can tell) of *Cortinarius vinaceolamellatus* in South Australia.

For each specimen we collected we took photographs in situ, noted a brief description, recorded the location, the surrounding plant community, substrate and any other notes of importance (such as smell.) We then collected the specimens and took taxonomic photographs (i.e. gills & cross section), performed microscopy where we described and photographed the spores, dried the specimens (for our own collection or to submit to the SA herbarium) and catalogued all of this information, including best guess for species which we were not confident in the identification of using morphological features.
Our intention for this project was to perform DNA extraction and analysis of several regions of our 4 target species. After several trials, we were unfortunately not having any success with these runs and decided to tweak our process to account for any possible issues, even with these adjustments we were still having no success. We were fortunate to have outside help with testing our process and when these runs were successful, we began the progressively eliminating variables until we discovered that the issue was with our second-hand thermocycler. Unfortunately, this meant that what could have been a number of successful extractions came to a halt at the last step in the PCR process. Thankfully, with properly functioning equipment, we have started to see some results which we look forward to sharing in the future.

It has been an absolute please to contribute to unlocking some of the secrets of *Cortinarius* in South Australia and we were fortunate to receive a DEW citizen science small grant to fund our project into the future.
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You can follow our project online:
iNaturalist: inaturalist.org/projects/wild-webcap
Instagram: @wild.webcap
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