2025 Chile Biosciences Final Report

Overview

Expedition Title	Assessment of the population of Glomeromycota spores in moss balls (*Rigodium implexum*)
Expedition Advisor	Dr César Marín (cmarind@santotomas.cl)
Dates	Start Date: Aug 15, 2025 End Date: Sep 5, 2025
Summary	For our expedition we spent three weeks in Chile, Valdivia. Our research involved: sampling at various sites, sample isolation, extraction of AMF spores, and a visit to Myconativa- a leading Bio-stimulant company.
Medical Matters	No medical matters were experienced on this Expedition
Aims & Objectives	• Collect *Rigodium implexum* and complementary soil samples from varying locations • Discover presence of Glomermycota spores in *Rigodium implexum* • Analyse population of spores found • Compare soil spore population to moss ball spore population • Analyse the environmental drivers • Allow for further taxonomic analysis

Expedition Specifics

Sampling

We sampled two different sites, both of which were 'Olivillo' (*Aextoxicon punctatum*) forests: the Bosque Experimental San Mártin Study Site, owned by the Austral University of Chile 39°39.0707'S, 73°11.5652'W, and a forest near Lago Ranco 40°32.1673'S, 73°48.1342'W, which is more mountainous.

Sample Isolation

We followed a protocol for the isolation of the spores that we created with our advisor Cesar Marín that is based on the classic isolation process used for soil used from:

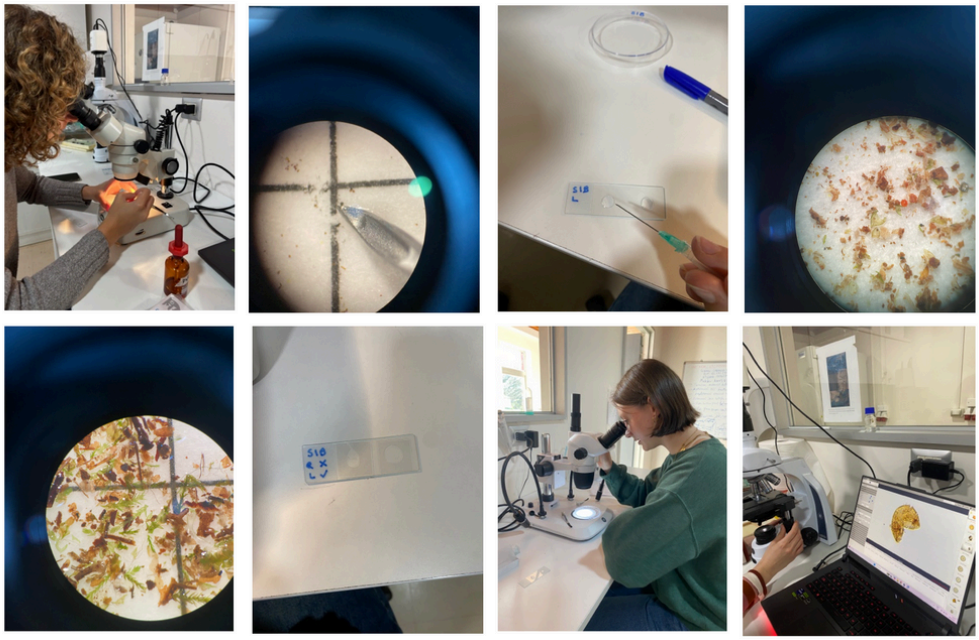
- Dry the Moss at room temperature
- Cut the Moss into fine particles using scissors and place in jars
- Weigh 10 grams for moss and 20 grams for soil
- Place the moss sample in a 200ml beaker filled with water, and use a magnetic stirrer to saturate the sample
- Place a saturated sample in the column of sieves with sizes 1000 µm, 500 µm, 250 µm, 106 µm, 53 µm, and 38 µm

Sample Isolation

- Wash the sample through sieves and collect a sub-sample at the 106 µm (A) and a sub-sample of the 53 µm and 38 µm sieves (B)
- For each sub-sample wash the content into 50 ml Falcon Tubes, aiming for 25 ml of sample. If this is not reached, water is added
- Then, using a 60ml syringe with a hose, add 25 ml of 70% sugar solution (700g of sugar in 1000 ml of water) for each Falcon Tube
- Cap the tubes and place them in the centrifuge at 3000 rpm for 10 minutes
- Subsequently, each of the sample supernatants is passed through the 38 µm sieve and gently washed with water
- For each sub-sample, what remains on the sieve is poured onto filter paper on a vacuum pump to dry the sample
- Then, place filter paper into Petri dishes
- Repeat for 3 samples from each location, including both soil and moss (resulting in 24 Petri dishes)
- Place samples in fridge until ready to be analysed

Spore extraction

We then proceeded to take the Petri dishes and analyse each of them using a Stereo Microscope. Using this, we were able to look through the Petri dishes and were able to identify what we thought were spores. We used small needles to take these potential spores and place them onto microscope slides, allowing us to identify them better. We had help from Cesar and some of the other members of the lab to identify what where spores as there was a large volume of matter in each of the samples.



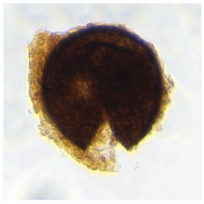
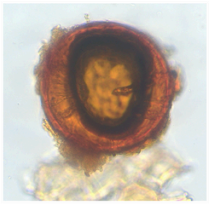
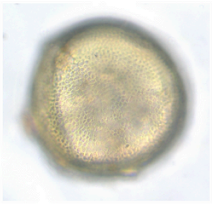
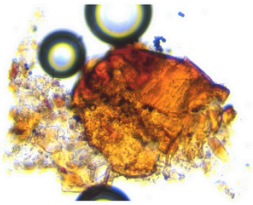
Myconativa

Finally, after our lab research was complete, we took our various extracted spore samples up to MycoNativa headquarters, where we met CEO and founder Paula Aguilera Ñonquepan, a contact of our host Cesar. Paula and her team kindly gave us a detailed tour of their various labs and greenhouses where they are constantly working on improving and creating new effective bio-stimulant products, all involving a range of AMF species. The researchers at MycoNativa played a key role in the next stage of this research as they helped to classify the taxonomy of our extracted spores. This information can be used to further assess the relationship between specific AMF species and native moss of the Chilean region.

Expedition Timeline

Step	Location	Start - End
Sampling	Bosque Experimental San Martín study site, Lago Ranco	Aug 18, 2025 Aug 22, 2025
Sample isolation	CIC Centro de Innovación Colaborativa Los Ríos	Aug 25, 2025 Aug 27, 2025
Spore extraction	CIC Centro de Innovación Colaborativa Los Ríos	Aug 28, 2025 Sep 1, 2025
Myconativa	Myconativa Itda in Mahuidache	Sep 3, 2025

Results

Achievement of Aims and Objectives	We successfully achieved all the aims and objectives that we deemed relevant to our final research process. As part of our scientific methodology, we collected our samples and from these we were able to discover the presence of AMF spores within *Rigodium implexum* moss balls. The taxonomic analysis of the spores present in both the soil and moss samples from each site allowed us to greater understand and compare the populations of spores found after extraction. Since our part of the procedure is only the foundation of further scientific research, we decided it was not necessary for us to analyse the environmental drivers. This is likely to be done later in the research process.
Spores Extracted & Taxonomy	Some of the spores were isolated and classified by the scientitst at MycoNativa. Below are the identified spores:  *Ambispora gerdemanii*  *Acaulospora laevis*  *Acaulospora sieverdingi*  *Glomus aureum*