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Microbial communities in snow covered soil of earliest stages of soil development: diversity, seasonality and interactions

IMC9

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Rotmoos glacier forefield

- Alpine Mycology fungal fruitbody inventories
- Mycorrhizae of alpine ectotrophic plants *Salix herbacea, Kobresia myosuroides, Bistorta vivipara*
- Saisonal dynamics of soil fungal communities

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Rotmoos glacier forefield

- Alpine habitats are rich in fruitbody-forming fungi (>150 spp.)
- Mycorrhization degree of alpine ectotrophic plants is very high: *Salix herbacea, Kobresia myosuroides, Bistorta vivipara*
- Saisonal dynamics of soil fungal communities.
  Fungal biomass is up to ten fold higher during the snow-covered perion than during summer.

Winter-active soil fungal communities are diverse and productive

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Soil microbes and ecosystem development

- When and where do soil microbial communities (SMCs)originate?
- What are main factors affecting changes in SMC?
- What are the main functions of earliest SMC?

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Rotmoosferner glacier forefield

(O: 0-3, A: 9-14, B: 18-25 years after retreat of glacial ice)

Sampling during snow-covered and snow-free period

In-growth mesh bags vs. soil

Amplicon sequencing and cultivation of fungi from MBs

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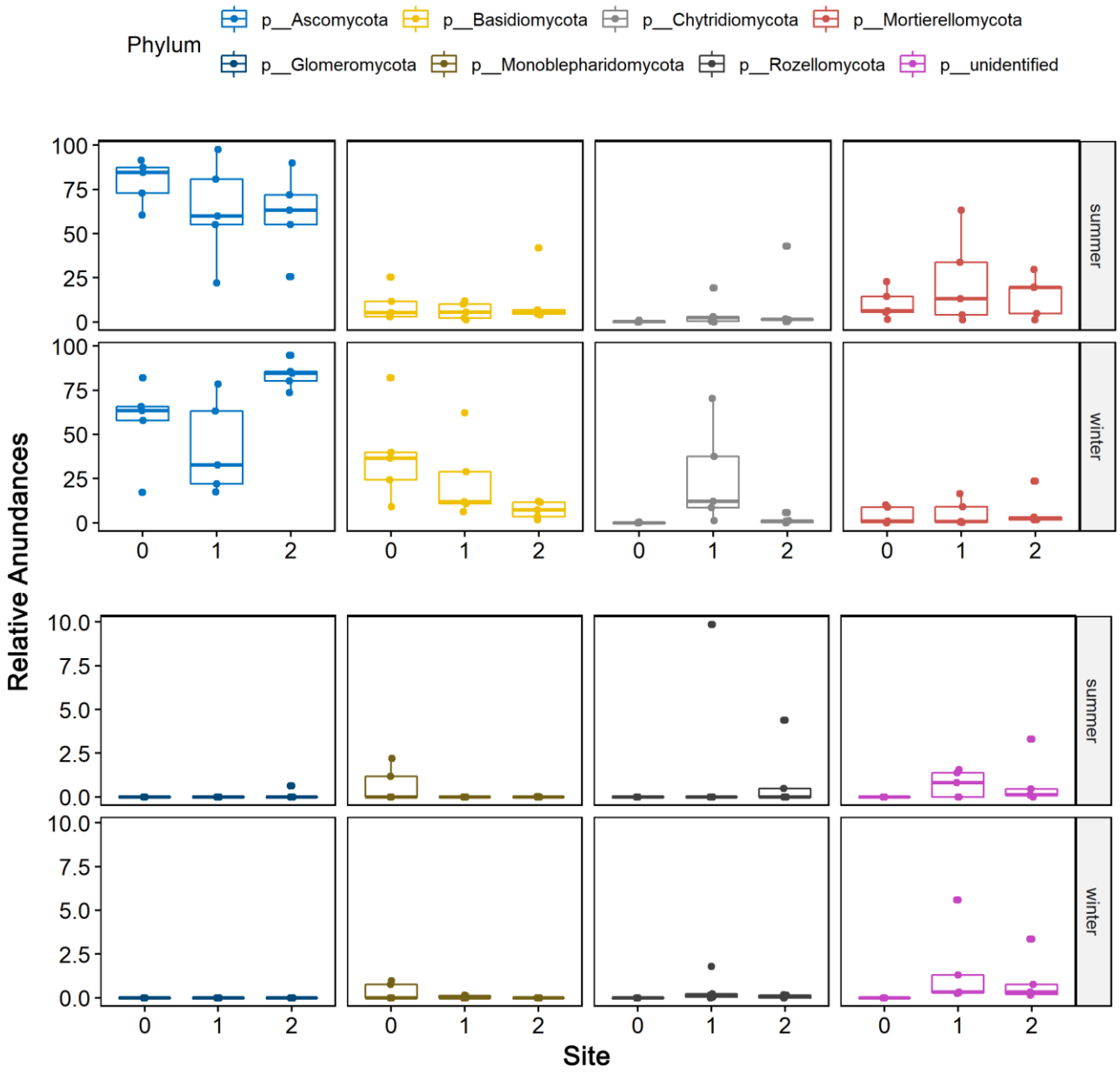
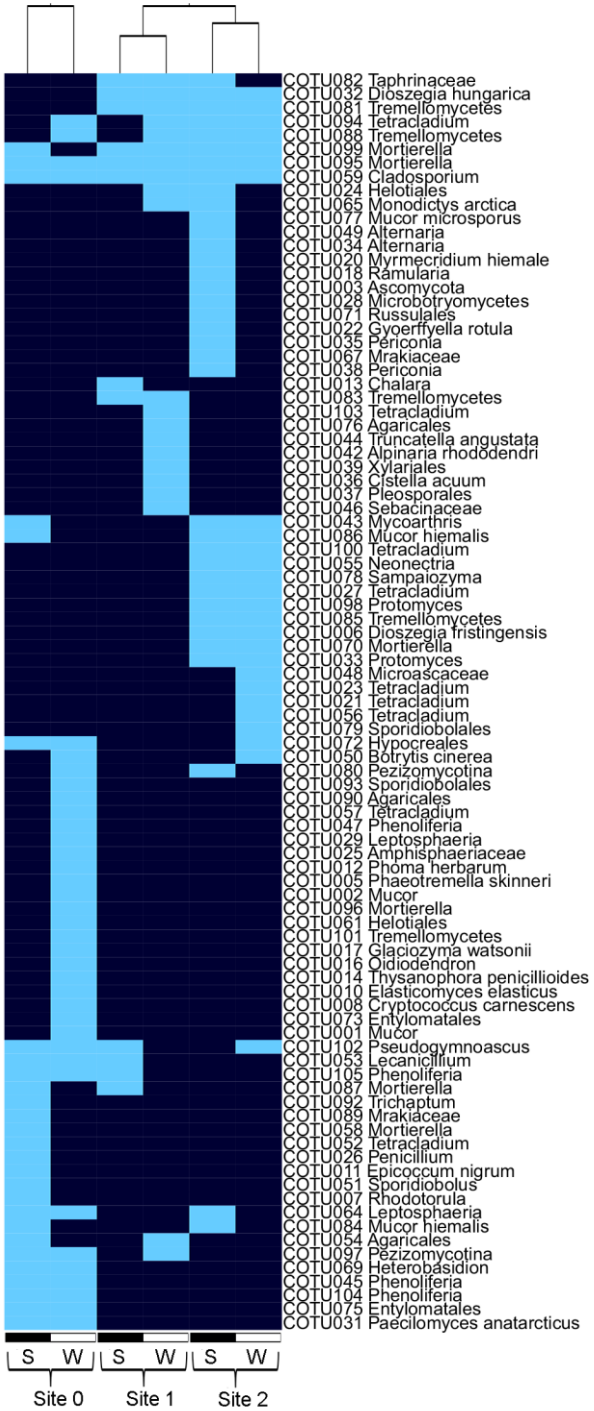


High Fungal Diversity
220 OTUs

Ascomycota
dominating

Winter-active
Basidiomycota



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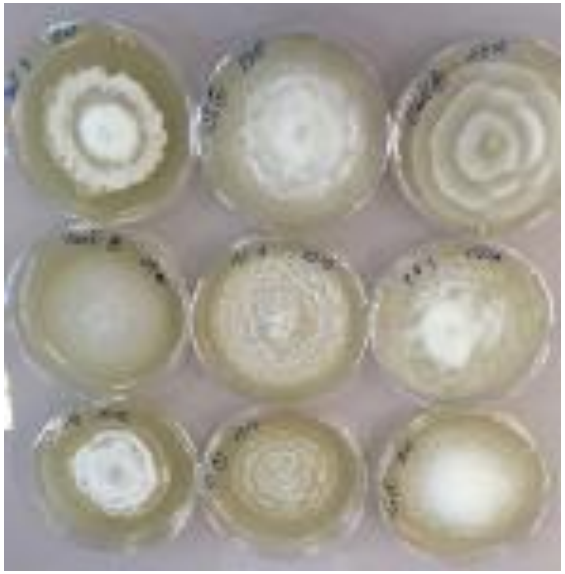
High diversity of cultivable fungi
138 cultivated OTUs

Basidiomycete yeasts have a high preference for winter

High proportion of unknown taxa



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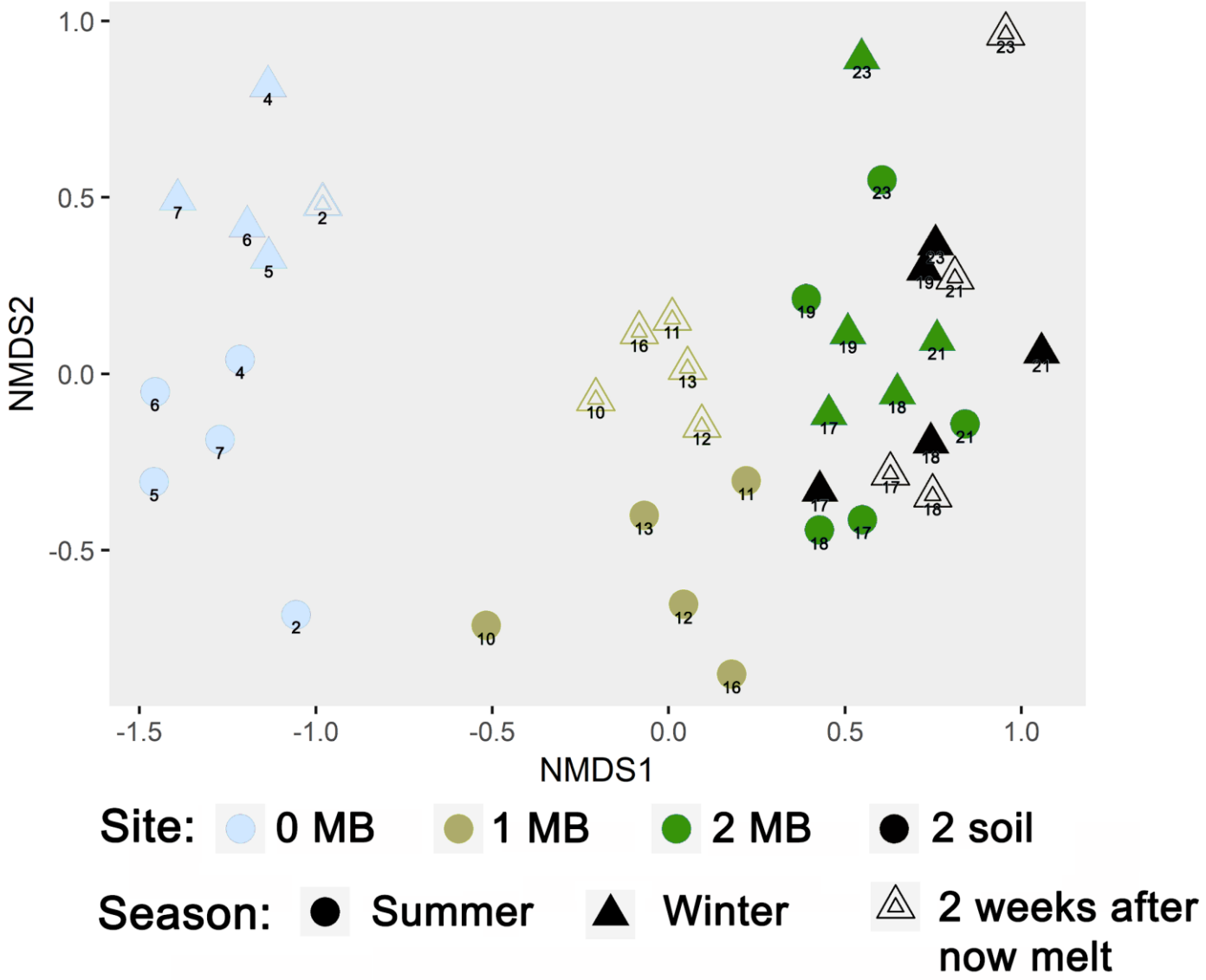

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Soil microbes and ecosystem development

- Microbial communities from ice and cryoconite are important inocula for earliest ice-free barren sites
- The establishment of first patchy plants is the most important factor for replacement of earliest microbial communities by typical soil microbial communities
- Earliest microbial communities appear to be more active during the snow-covered period than during summer

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Microbial Interactions in Snow-Covered Habitats

Project Proposal

directed to the

Fonds zur Förderung der wissenschaftlichen Forschung

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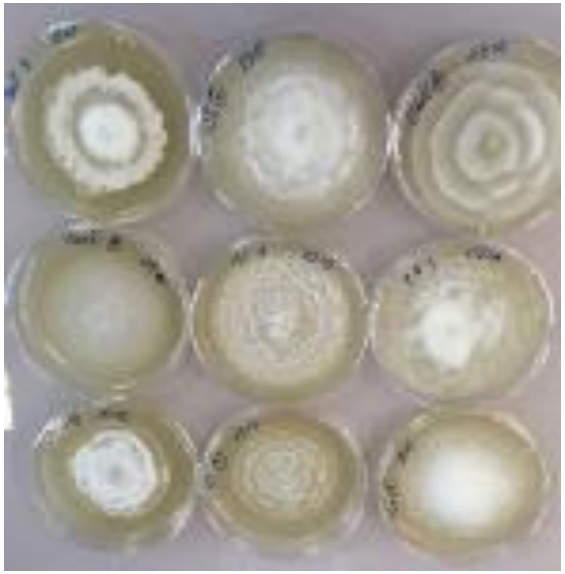
Aims

- Identify co-occurring prokaryotes and fungi growing in snow-covered soil
- Isolate fungi and associated prokaryotes
- Detect specific fungi-prokaryote interactions



Anusha Telagathoti Poster

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Involved Persons

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- Philipp Dresch
- Beat Frey
- Pietro Buzzini
- Benedetta Turchetti
- Franco Biasioli
- Kerstin Voigt