

Master's thesis: Soil microbial communities under litter exclusion

We offer a Master's thesis project within the framework of the MyDiv Experiment (<https://idiv-biodiversity.de/de/research/platforms-and-networks/mydiv.html>). The thesis would be part of the TreeREx experiment, which investigates the effects of litter resource exclusion on soil food webs in tree communities of different diversity.



Background:

Most tree species are associated with either arbuscular or ectomycorrhizal fungi, which supply plants with nutrients to gain carbon. Similar to the positive effects of tree species diversity on ecosystem functioning, we assume that trees of different mycorrhizal type within a community have higher ecosystem functioning compared to that with only a single type of mycorrhiza. Shifts in ecosystem functioning may also lead to changes in trophic structures within food webs. The TreeREx experiment is a litter exclusion experiment where we set up two subplots, one with litter and one without litter input. We will be able to see the effects of the lack of this essential basal resource on food web structure. In addition, we will study how the effects of tree communities of different species and mycorrhizal diversity influence the litter effects.

Thesis project:

We expect the effects of litter exclusion on microbial communities in soil to be comparably strong. The Master's thesis will investigate the soil microbial community structure using the PLFA method (Phospholipid fatty acid method). This method utilises the fact that certain microbial groups synthesise specific biomarker fatty acids that can be traced in soil samples inferring the biomasses of different microbial groups. The practical work will mostly include PLFA analysis in the lab with single field trips to the MyDiv Experiment in Bad Lauchstädt.

What we offer and what we expect:

We offer research training and education in a diverse, welcoming, and motivated team, supervision by experienced and highly motivated researchers at a unique research centre and the possibility to work on a globally important ecological question. The ability and willingness to work in a team are absolutely necessary. Basic skills in the statistical software R or the motivation to acquire them are required. The thesis can be written in English or German.



Contact:

The experiment is led by Dr. Olga Ferlian (olga.ferlian@idiv.de) and the thesis project will be co-supervised by Prof. Dr. Nico Eisenhauer (nico.eisenhauer@idiv.de). Please get in touch with Dr. Olga Ferlian if you are interested in this thesis.