Master thesis

Consequences of mycorrhization type and soil fauna size class on tree leaf litter decomposition under drought

Background

Leaf litter decomposition is an important ecosystem process that is tightly linked to nutrient cycling. Litter decomposition is driven by leaf litter chemistry, *i.e.,* leaf nutrients and metabolites, as well as the local soil biota community. Soil meso- and macrofauna affect litter decomposition by directly feeding on litter and microbial communities, and indirectly by fragmenting the litter, thus promoting resource access to other decomposers, such as fungi. Especially, fungi play an important role in (litter) decomposition as species of this group are known to be the only organisms able to break down recalcitrant litter compounds such as lignin, cellulose, and high-molecular weight phenolics, such as polyphenolics / tannins, paving the way for subsequent decomposition by bacteria. In addition, mycorrhizal fungi, *i.e.,* arbuscular mycorrhiza and ectomycorrhiza, can affect leaf chemistry and thus subsequent leaf litter decomposition. Here, we want to test how mycorrhization type and soil fauna affect the decomposition of tree leaf litter using litter samples from the FunDrought Experiment.

Project

The thesis will be part of the FunDrought experiment that will be established at the iDiv EcoTron facility in 2023 and aims to test how mycorrhization type and soil fauna size class interactively modify the relationship between biodiversity and ecosystem functioning and its response to a drought event. In your thesis, you will prepare litter samples to be set-up in the experimental mesocosms and will measure litter decomposition rate, leaf carbon and leaf nitrogen concentrations as well as leaf phenolics, which are important parts of leaf litter chemistry and known to drive litter decomposition. You will learn the associated methodologies and statistical approaches to analyze your data as well as gain insights into the FunDrought experiment, the EcoTron facility, and the MyDiv Experiment.

Profile

You are interested in Biodiversity – Ecosystem functioning (BEF) research, plant ecology, soil ecology, or litter decomposition. You have worked in a lab before and you are interested in learning new methods. Prior knowledge about litter decomposition is not required but can be advantages.

Supervision

The master thesis will be supervised by Dr. Christian Ristok (iDiv / UL) and Dr. Pierre Ganault (iDiv / UL).

If the project has piqued your interest and/or you have further questions about the project, please contact us at any time *via* mail (christian.ristok@idiv.de ; pierre.ganault@idiv.de).

Contact

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