Impacts of mycorrhizal fungi on leaf pathogen and herbivory

We offer **Bachelor and Master theses** within the framework of the MyDiv experiment (https://idiv-biodiversity.de/de/research/platforms-and-networks/mydiv.html). The theses would be part of the **CMN** experiment, which investigates how plant community diversity and composition influence the effects of **c**ommon **m**ycorrhizal **n**etworks (**CMN**).

Background:
Most tree species are associated with either arbuscular or ectomycorrhizal fungi, which supply plants with nutrients to gain carbon (first panel in figure). Tree species of the same mycorrhizal fungi are potentially interconnected via mycorrhizal networks (second panel in figure). These networks can influence plant establishment and growth, nutrient acquisition and storage, defense against pathogens and herbivory by transferring carbon, nutrients, water and plant signals (Tedersoo et al. 2020). The CMN experiment led by Dr. Shan Luo and Prof. Dr. Nico Eisenhauer investigates whether the performance of seedlings change when they are not connected to the mycorrhizal networks of adult trees, compared to when they are allowed to form mycorrhizal networks with adult trees.

Thesis project:
The CMN experiment was set up in March 2022 (third panel in figure), and the first sampling will take place in September 2022. Potential Bachelor or Master thesis projects are: (a) response of leaf pathogen infection rate to the exclusion of mycorrhizal network connection between seedlings and adult trees; (b) response of leaf herbivory rate to the exclusion of mycorrhizal network connection between seedlings and adult trees.

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. We expect the students to be willing to go to the field for leaf sampling and perform different kinds of lab works (such as scanning leaves, measuring leaf pathogen and herbivory rates).

Contact:
The CMN experiment is led by Dr. Shan Luo (shan.luo@idiv.de), and the thesis project will be co-supervised by Prof. Dr. Nico Eisenhauer (nico.eisenhauer@idiv.de). Please get in touch if you are interested in discussing the options.

Reference:
Tedersoo, L., Bahram, M., & Zobel, M. (2020). How mycorrhizal associations drive plant population and community biology. *Science*, *367*(6480), eaba1223.