

There will be a combined Mydiv - EcoTrack experiment in 12 EcoUnits of the iDiv Ecotron starting in May 2019. We will study the impact of warming and (tree) litter homogeneity/heterogeneity on animal (small epigeic invertebrates) movement. More details on the planned experiment are described below. If you would like to get involved in the experiment by contributing additional measurements of response variables (without impacting the currently planned analyses), please contact Uli Brose by sending him an Email.

EcoTron Proposal: Temperature and habitat heterogeneity affect predator-prey movement patterns

Question:

How does the (tree) litter heterogeneity and temperature affect the movement patterns of predator and prey species?

Hypotheses:

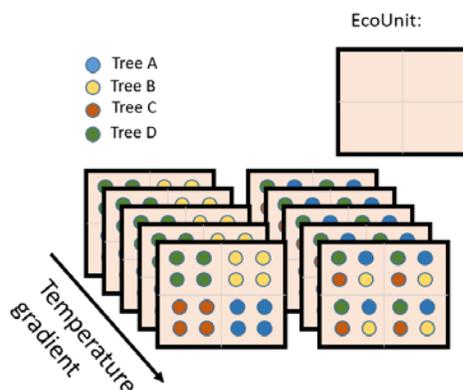
A. Movement ecology

- 1) In heterogeneous habitats, prey predominantly move into patches of high stoichiometric litter quality.
- 2) In homogeneous, well-mixed habitats, prey follow more random movement paths.
- 3) Predators efficiently track their prey and follow them into the same habitat compartments.
- 4) Predator aggregation in habitat compartments causes prey movement out of this compartment.
- 5) The speed of these movements increases with warming.

B. Biodiversity-ecosystem functioning

- ~~6) Small-scale heterogeneity (i.e. diversity within subunits of EcoUnits) will allow for tree species complementarity~~
- 7) Small-scale litter mixing will support higher levels of decomposer activity and population sizes that may cascade up to higher predator fitness

Experimental design:



Experiment:

- A total of 12 EcoUnits will be used;
- The litter of four tree species will be selected from the MyDiv experiment, 2 AMF and 2 EMF species, differing in litter stoichiometry (one high CN and one low CN species per mycorrhiza type): oak, ash, birch, sorb.
- Each EcoUnit will have all 4 litter types, but there will be 2 treatments of heterogeneity (6 replicates each → 12 EcoUnits): the litter of the 4 species will be (A) spatially separated or (B) well mixed (see figure);
- Response variables: litter decomposition, tree (oak phytometer) and soil stoichiometry (CNP).
- The movement experiment will be added on this MyDiv experiment in the same 12 EcoUnits.
- Heating infrastructure will be installed in the 12 EcoUnits to warm the units to different temperatures above the environment.
- The upper soil layer (just below the litter layer) will be equipped with RFID sensors.
- Response variables: Prey (woodlice, millipedes) and their predators (centipedes such as *Lithobius spec.*) will be tracked by RFID tags.