Wintersemester 2024

# Land use effects on invertebrate diversity and food webs

Background: Biodiversity is shaped by organismal differences in the consumption, utilization and allocation of nutrients as well as the environment they are immersed in. In this project we aim to determine the impact of grazing and mowing in the diversity of organisms in grasslands and forests, focusing on invertebrates, largely insects and spiders. Many of these groups have never been addressed before and their status is not known, which makes it an exciting project to work on.

Methodological approach: The laboratory work consists on sorting samples of pitfall traps, window traps, swipe netting and targeted collection were collected in Spring-Summer 2024, by their taxonomy using microscope and taxonomical keys. After entering the count of each organism into an excel file we will be doing statistical analyses with R Software, in order to understand species distribution and abundances in a landscape context (landscape heterogeneity, land use, urbanization).

Research question: What is the effect of land use on the diversity and composition of invertebrate communities? Other related questions of your interest would be considered, as this large dataset will be valuable for addressing multiple questions on ecosystem services and landscape ecology.

Time frame: Starting now! The samples are there and they are waiting for you. You can start anytime from November 2024 onwards.

Requirements: Musts: Motivation and responsibility. Willingness to work in the lab with sometimes dirty samples. Attention to detail. Love for nature and insects. **Advantageous:** Basics of R Software. Background in ecology. **We provide:** This is an unpaid thesis for TUM/LMU students. We provide training in different areas (e.g., taxonomical identification, statistics, communication), team work, a great working environment and possibility to be part of publications.
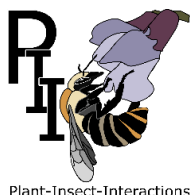
Contact with a CV, motivation letter and, if you have, references:

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Wintersemester 2024

Effect of warmer temperatures during overwintering on the physiology of wild bees

Background: Climate change affects insects, special when leading to warmer winters and earlier springs. Little is known however on the mechanisms of those effects, including those on the physiology of organisms. Wild bees are already threatened by a number of global change drivers and changes on their overwintering patterns could be detrimental to their development and success in spring.

Methodological approach: We want to look for differences in fat consumption between wild bees of different species that have overwintered in a gradient of temperatures. We do that with chemical essays and statistical analyses. The bees are already there after an experiment with different temperatures last year, so the thesis would be based on lab work (e.g., GC-MS) and analytical work.

Research question: What is the effect warmer overwintering temperatures on the physiology of wild bees? Other related questions of your interest would be considered, as this large dataset will be valuable for addressing multiple questions on ecosystem services and landscape ecology.

Time frame: Starting now! The samples are there and they are waiting for you. You can start anytime from November 2024 onwards.

Requirements: Musts: Motivation and responsibility. Willingness to work in the lab with chemicals and following protocols. Attention to detail. **Advantageous:** Basics of R Software. Background in chemistry. **We provide:** This is an unpaid thesis for TUM/LMU students. We provide training in different areas (e.g., chemical lab, statistics), team work, a great working environment and possibility to be part of publications.

Contact with a CV, motivation letter and, if you have, references:

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