Master/Bachelor thesis: Insect monitoring in mountain regions

Short description: Insects play a crucial role in almost all ecosystems on earth. However, studies from abroad indicate a dramatic decline in the diversity and biomass of insects in recent years (e.g., Hallmann et al. 2017, Vogel et al. 2017, van Klink et al. 2020, Wagner et al. 2021, Widmer et al. 2021). Reasons for this "insect decline" include the loss of natural habitats due to more intensive land use, the use of fertilizers and pesticides, habitat fragmentation and lack of connectivity, and the introduction of non-native species. But also climate change might exerts pressure on ectothermic, i.e., temperature-dependent organism, forcing various species to alter their ranges (McCain and Garfinkel 2021), or decoupling interactions between plants and these organisms, such as between flowering plants and pollinators, or food plants and plant-eating species specialized on them.

Especially in mountain regions, climate warming poses significant challenges for many invertebrates. Species from lower elevations can colonize higher-altitude areas, while alpine species may have to move to even higher elevations to reduce competition for resources. The upward movement of plants in the mountains is well documented—where previously only one or a few species occurred on mountain peaks, the Swiss and European alpine flora is now more diverse (Steinbauer et al. 2018). Similar movements are known for insects (McCain and Garfinkel 2021) and in Switzerland, an upward trend in elevation distribution was observed for many insect taxa (Vitasse et al. 2021). However, we still lack a comprehensive understanding of how climate change is altering insect communities, or how different insect groups are distributed along elevational gradients.

Supervisor: Anne Kempel, anne.kempel@slf.ch

Project: In this Masterproject you will investigate how insects are affected by climate change through a combination of analysing an existing dataset or/and through gathering and analysing new insect data along elevational gradients. We can decide - depending on your availability – where we will lay the focus of your work, e.g., if you are only available in winter the analysis of the existing dataset plus some insect identification could be an option. If you are available over the summer, the project could also contain field work in the region of Davos.

We are looking for a highly motivated student interested in insects and climate change effects. You should be a team player and have ideally some experience in data analysis using R. The master project takes place in Davos at the SLF (part of the WSL) and we help in finding housing in Davos (housing costs will be mostly covered by the SLF). We offer an inclusive environment in an enthusiastic and small ecological team, in a stunning alpine environment. If you are interested, please send a motivation statement to anne.kempel@slf.ch

Major: Ecology and Evolution, Umwelt und Naturwissenschaften

Start: flexible depending on project.