



Eidg. Forschungsanstalt für Wald,
Schnee und Landschaft WSL



PHYTOAKMETER



Master /Bachelor Thesis Opportunity

“Effect of Microclimatic Gradients in Tree Crowns on Plant Phenology & Plant-Herbivore Interactions”

The Forest Entomology Group of the Swiss Federal Research Institute, WSL is offering an exciting Master or Bachelor thesis opportunity titled at the intersection of **forest canopy ecology**, **chemical ecology (metabolomics)** and **entomology**. The thesis work will allow the candidate to gain experience in plant phenotyping, insect damage quantification and state-of-the art plant metabolomics including sample preparation, processing, and phytochemical analyses. This project is implemented within a part of a large multi-groups project “PhytOakmeter” that aims to determine how rhythmic growth patterns in oak, herbivory, and climatic gradients individually and in interaction affect oak chemistry and oak-herbivore interactions.

Details: Due to their size and vertical stratification mature trees possess pronounced vertical gradients in temperature and light conditions. These within-tree microclimatic gradients have been associated with variation in leaf chemistry and herbivory. This project is designed to quantify the relationship between within-tree microclimatic variation, phytochemistry and herbivory and to understand to what extent light and temperature gradients contribute to within-tree variation in leaf phenology, chemistry, and herbivory. The project will be mainly performed in the field (canopy crane site Hölstein, Basel). We will install Pedunculate oak (*Quercus robur*) clones at different crown strata of mature oak trees thereby simulating the upper canopy, lower canopy or ground-level light intensity and temperatures. At different oak growth stages, leaf chemistry and herbivory of the oak clones will be measured. The results of this study will elucidate on the extent which light and temperature gradients of different forest strata contribute to within-tree variation in leaf phenology, chemistry, and herbivory. The data can contribute to the publication of a main sub-project of the PhytOakmeter or be published separately in a scientific journal.

Start: April/May 2024

Working Breakdown: field work (canopy crane): 40 %, lab work: 30%, office work: 30%

Requirements: You should have a strong interest in plant-insect interactions and not be afraid of heights (canopy crane work). Basic skills in statistics with R are advantageous. In-depth knowledge in analytical chemistry is not mandatory for this project.

Contact: Dr. Moe Bakhtiari (mojtaba.bakhtiari@wsl.ch)

More information about the forest entomology group can be found here:

