

## Community structure in *Sarracenia purpurea* microcosms and adjacent peatlands

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Water-filled habitats in plants (“phytotelma”), are widely used model systems in community ecology as they represent discrete miniature ecosystems (aka microcosms) that can quite precisely be observed in space, time and environment. The patterns of local- and regional diversity, species turnover, evenness, colonization and dispersal in these systems are poorly understood. In this thesis, the microbial communities inhabiting the pitcher-shaped leaves of *Sarracenia purpurea* ssp. *purpurea* were used to explain colonization, community structure and diversity patterns of metacommunities.

In chapter I, the main focus was the detection of colonization paths of new pitchers and unraveling community structure and its drivers. As the microbes in the surrounding mosses showed a high taxonomic overlap with the pitcher communities, the mosses can be regarded as the species source pool of the pitcher communities. Several taxa and in turn, functional groups were newly recorded in the pitcher food web. On the pitcher-scale, pH and variables related to nutrient content were important for both pro- and eukaryotic communities, while the effect of site-level variables differed between domains.

In chapter II, abiotic variables were found to have a stronger influence on pro- and microeukaryotic diversity metrics ( $\alpha$ -,  $\beta$ - and  $\gamma$ -diversity and evenness) than space and time. Thereby, three variables with coinciding values throughout the five study sites were the most important, indicating that a panoply of environmental factors might drive diversity rather than a single factor.

In chapter III, the community structure of microbial peatland communities was found to be primarily driven by the habitat condition, a surrogate derived from the surrounding vegetation. The effect of the other environmental variables was mainly mediated through the habitat condition. This result suggests that the relative importance of existing vegetation for peatland microbes overrode the direct effect of other, more general factors, such as altitude.

### **Jury:**

- Prof. Thomas Flatt (jury president, University of Fribourg)
- Prof. Louis-Félix Bersier (thesis supervisor, University of Fribourg)
- Prof. Laure Weisskopf (internal expert, University of Fribourg)
- Dr. Carlos Melian (external expert, Eawag - Swiss Federal Institute of Aquatic Science and Technology, Kastanienbaum)