

Spatial structure of protists communities inhabiting pitcher plant in Switzerland

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The aquatic community inhabiting the leaves of the carnivorous plant, *Sarracenia purpurea*, is an ideal system to study community structure in a spatial context. Each plant contains multiple leaves, and thus multiple communities, and can be found across a large altitudinal- and latitudinal gradient. It is therefore possible to compare community dynamics both within- and across field sites. In our study, we described the community structure and composition of protists inhabiting the leaves of *S. purpurea* across field sites in Switzerland. We used two categories of leaf age to compare two different successional stages of community development. We analysed the community of each leaf with a microscope and determined the different species of protists that were present. We first tested if the variables describing community structure (S , S_{eff} , J , n_{tot}) were different between sites and successional stages. Second, we tested the effects of the explanatory (*volume, colour, altitude, openness, rain, number of clumps, temperature*) variables measured at the site- and leaf-level on these four metrics. Third, we used multivariate analyses to assess the effect of the explanatory variables on community composition. Finally, we tested the intra- and inter-site variability to compare the differences in composition with geographic distances. Results showed strong differences between early- and late communities for all tested community structure variables. Altitude and openness (i.e., percentage of tree cover) were the variables that had the largest effect on the composition variability between sites. We also found that the beta diversity was linked with a site. Communities were the most similar if they were from the same site, and the difference in community composition increased as the distance between sites increased. Results allow us to know which environmental factors are important and which are not necessary to consider in the analysis of the spatial structure of freshwater microorganism communities. In addition, they show the significant aspect of leaf age, and thus community successional stage, which confirms and reinforces the results found in previous studies.

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