

ABSTRACT

The life of bryophytes is closely connected with their surrounding environment. Changes in atmospheric conditions on the microscale directly affect the physiological functions of bryophytes, which in turn determine their distribution. The current development of technologies allows us to measure the microclimate affecting bryophytes directly in the field. Nevertheless, there have not been many studies published examining the response of bryophytes to *in situ* measured microclimate.

This diploma thesis is one of the first in Europe to provide data from continuous field microclimatic measurement performed on a scale relevant to bryophytes. It deals with the influence of the microclimate on the bryophyte species richness and community composition within a single gorge in the Bohemian Switzerland National Park. For 17 months, 38 HOBO Pro v2 Onset dataloggers were recording air temperature and air humidity 10 cm above the ground. I performed detailed bryological survey on two differently sized plots (circle with a radius of 1 or 2 m) around each of the dataloggers. The microclimate is influenced by the topography and character of the vegetation, therefore I derived topographical data from a digital terrain model (resolution of 1 m), calculated the canopy openness using hemispherical photographs and recorded vascular vegetation cover.

Using multidimensional ordination and linear regression techniques, I found that the effect of the microclimate on bryophyte species richness and community composition in study area varies, depending also on the size of the spatial scale or substrate. The microclimate significantly explains up to 32 % of the variability in the species richness of bryophytes, but its influence on the community composition is not significant. In the case of bryophyte community composition, topography is more important, as it significantly explains up to 21 % of the variability. Key microclimatic factors are related to evaporative stress, the occurrence of high temperatures and microclimatic fluctuations. Estimating microclimatic conditions based on topography is insufficient for studying bryophyte ecology. The influence of microclimate is more pronounced on larger spatial scales, on smaller ones, stochastic processes probably play a bigger role. I recognized the most sensitive reaction to microclimate in bryophytes dwelling on rock and dead wood.

Key words: bryophytes, microclimate, temperature, air humidity, species richness, community composition, fine spatial scale, digital terrain model, Bohemian Switzerland National Park