



Supervisor's report on the PhD thesis of Eliška Vicherová:

The ecology of peatland bryophytes – adaptations and competition in alkaline fens

Eliška has started in my lab as a master student focusing on the ecophysiology of desiccation stress in peatland bryophytes. During that time, she has already shown her dispositions for defining research questions and designing experiments, as well as for scientific writing. I was therefore pleased that she decided to continue with the ecophysiology on peatland bryophytes as a PhD student. She became a valuable member of a grant project "Calcium tolerance in *Sphagnum*, its physiological and genetic backgrounds, and consequences in mire ecology". Although being a field-oriented bryologist/ecologist, Eliška was able to focus her interest on the physiological processes that control the species responses to environmental stress and resulting ecological patterns.

Eliška is the first author of all four manuscripts of the submitted thesis. Tree papers has been published in high-quality journals. The two first papers are direct outcomes of the abovementioned project; the first one is based on laboratory experimental cultivations of fen bryophytes, utilizing a sophisticated control of water chemistry. The second paper benefits from a large 4-year field moss transplant experiment. Together, these papers elucidated how water chemistry affects fundamental and realized niches of mosses, which is important in our understanding of *Sphagnum* expansion to alkaline fens and subsequent biodiversity loss.

The next two laboratory studies (on moss communication through volatile organic compounds and on the cellular mechanisms of calcium stress in mosses) arose purely from own initiative of Eliška. She contacted specialized laboratories abroad and arranged stays there, during which she learned the methodologies and performed experiments. The study on volatile organic compounds (done at SLU, Uppsala, Sweden) is highly innovative, far exceeding the field of peatland ecology but the selection of model species nicely fit to the thesis aims. The last study (partly done at UMCS, Lublin, Poland) provides new insights into cellular-level mechanisms of calcium toxicity in plants in general. This manuscript is currently waiting for a revision/submission after rejection.

In summary, Eliška mastered applications of physiological experimental approaches in solving ecological questions with strong overlap to nature conservation. Her approach was highly responsible and partly independent (when bringing and solving new ideas far from my experience). Although her interest somewhat diverged from experimental research during her studies – Eliška became a respected and sought-after bryologist active in nature conservation – the scientific impact of her research is undisputed (the three published papers has been cited already 55 times).

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