

DESCRIPTION FOR THE GENERAL PUBLIC

The basic knowledge about the vegetation ecology and diversity is of the fundamental importance in understanding the Nature of our planet. Despite hundreds of years of thorough scientific research on that issue, there are still many gaps left that need further explorations. Particularly it is related to the underground diversity and structure of the phytocoenoses. So, the main aim of the research is to find out the true diversity and species composition of the Central European grasslands by exploring the underground parts of the vegetation. The additional aim is also to identify the most important environmental variables that influence the difference between the above and underground species diversity. As it was recently highlighted, this difference could have the considerable value of approx. 40%-60%.

Realization of the project allow us to answer the following questions:

- (1) How many plant species contribute to vegetation plots of CE grasslands if we take also the below-ground portion of the community?,
- (3) What are the most important environmental drivers of the difference in richness and diversity of below- and above ground part of the plant communities,
- (4) What is the influence of plant-fungi interactions on the difference in richness and diversity of below and above ground parts of vegetation,
- (5) How the anthropogenic disturbance of grassy community influence the underground richness and diversity in comparison to the aboveground?
- (6) What is the relation of A/B richness and diversity ratio to the area of sampled plot? (Species – area relationship),

We will be able to answer this question by applying the environmental DNA metabarcoding analysis techniques. Thanks to the new generation sequencing of genes we can identify exactly the species from the roots as well bulbs, rhizomes and other underground living parts of plants.

The planned research could have a unique contribution to the basic knowledge related to the species composition, species turnover, structure, dynamism and conservation of European grasslands. The result could bring important implications for revisiting or broaden the knowledge related to some crucial theories and processes in vegetation ecology, ecotone formation, patterns of species distribution and species-area relationship. The project results should also, for the first time, show the relation of A/B ratio of R and H along the gradient of mycorrhiza frequency and anthropogenic disturbance in central European grasslands. In our opinion it will also significantly influence the hierarchical system of grassland classification as we expect the difference in occurrence of diagnostic taxa for particular vegetation type below and above ground.