**Resilience of *Sphagnum* moss communities: response to Holocene climate change and effects on carbon accumulation rates in ombrotrophic mountain peatlands in Central Europe**

Ombrotrophic peatlands (peatlands fed entirely by precipitation) are habitats for a range of relict/rare species and play an important role in the maintenance of biodiversity.
Many ombrotrophic mountain peatlands in Central Europe have not been subjected to drainage, forest clearance and peat exploitation and they represent reliable archives for the history of local vegetation development and peat accumulation. This is of particular significance for the reconstruction of local vegetation development and its response to climate changes, given that in many areas of the world natural peat dynamics have been profoundly affected by anthropogenic influences.

Despite their excellent preservation, the selected ombrotrophic bogs in our project have not yet been used for the reconstruction of local vegetation development or for understanding the processes leading to their formation. To fill the gap in our understanding of drivers of peatlands development, we plant reconstruct the local vegetation dynamics of mountain raised bogs in Central Europe based on contiguous, high-resolution plant macroremains analyses. Objectives in our project are: i) reconstruct of vegetation and identify the impact of climate changes, air pollution and fire on *Sphagnum* mosses and vascular plants occur in ombrotrophic habitats; ii) reconstruct changes in carbon accumulation rate over the Holocene (last 11 500 years) and assess their sensitivity to changes in past climatic and hydrological conditions; iii) determine natural reference conditions as the basis for the restoration of damaged habitats of *Sphagnum* species.

In our project we evaluate if regional climate changes had a stronger influence on the development of small ombrotrophic mountain peatlands in this region or if the local autogenic succession was more important. Our temporal perspective and high resolution, contiguous sampling approach allows the identification of the time of the appearance, expansion, and retraction of local plant taxa, which are under protection. Furthermore, our results have implications for understanding the response of mires to past hydroclimate changes and demonstrate the potential of peat records as valuable proxy-climate archive records.
For detailed palaeoecological analysis we selected four peatlands located in different part of Central Europe: Mohos (Romania, East Carpathians Mts.), Tarnawa Wyżna (Poland, Bieszczady Mts.), Bregquelle (Germany, Schwarzwald), La Tenine (France, Vosges Mts.). During our studies we conduct detailed palaeoecological analysis of peat cores by using various methods: plant macroremains analysis, bulk density, organic matter content, stable isotopic composition (13C and 15N), geochemical analysis, pollen, analysis of micro- and macro charcoals, testate amoebae. To the reconstruction detailed absolute chronology of events in the history of the ombrotrophic peatlands AMS radiocarbon dating will be used.

We plan conduct these studies, because we want understand how communities, where main role play *Sphagnum* mosses may respond to conditions projected by climate models. It is important for understanding the future of peatlands ecosystems in the Central Europe. The knowledge on the history of mountain bogs within the Holocene will have a significant practical application and will be particularly important in the case of restoration of damaged oligotrophic habitats.