

## **Eutrophication of lakes: The case of biodiversity assessment and potential use of freshwater testate amoebae for environmental reconstruction in the agricultural region of Central Europe**

Over the past few centuries, lakes around the world have experienced significant eutrophication, mainly due to human activity. Intensive agricultural practices in lake catchments lead to excessive enrichment of water with nutrients, which results in increased productivity of lake ecosystems. This phenomenon directly affects the testate amoebae – single-celled protists. They inhabit, among others, lakes and peatlands. They are very sensitive to changes in the environment, making them excellent indicator species. They are also used in paleoecological reconstructions, thus helping to reconstruct past environmental conditions. One of the ongoing challenges of modern ecology is to understand how pollution and eutrophication affect testate amoebae communities in different types of lakes and geographic regions. Despite the increasing number of studies on these organisms in lakes, local and regional datasets are still lacking from many areas of the world. Their lack to date may hinder a full understanding of the ecological needs of different species. Expanding this knowledge is essential for the accurate reconstruction of past environmental changes. This project focuses on the study of the amoebae community in under-studied lake environments in the agricultural landscape of Central Europe. The main objective is to evaluate testate amoebae as a potential new proxy for monitoring lake eutrophication in this region. A local database containing information on the distribution of testate amoebae within the lake in different microhabitats will be created. Then a regional, large database on the distribution of testate amoebae in 30 lakes with different trophic conditions, from oligotrophic to eutrophic, will be developed. Statistical analyses will determine the ecological preferences of species. Finally, a reconstruction of the most influential environmental parameters over the last 300 years influencing the distribution of amoebae in lakes will be developed. This study will contribute to a better understanding of the ecology of testate amoebae and will also provide new, rare data on amoebae in lakes for this part of Europe..