

*The **ECOSPHERE research group** aims to study aquatic and valley ecosystems that are continuously challenged by natural and anthropogenic stressors. The research focuses on acquiring fundamental and applied knowledge at different levels of structural and functional organisation in order to underpin environmental management decisions.*

MASTER THESIS SUBJECT 2025

The diversity of aquatic and moss-inhabiting diatom communities in the Westfjords, northern Iceland

Research group: ECOSPHERE

Hosting laboratory: Meise Botanic Garden

Promotor: Prof. Dr Bart Van de Vijver

Co-promotor: Mrs Margaux Pottiez

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View of the Westfjords, northern Iceland with one of the sampled streams

- This topic mostly contains literature study, lab work, field work, experimental work, GIS, numerical modelling, other:
- Possession of driver's license B is needed, recommended, not needed
- Possession of certificates needed: FELASA C, other:



Diatoms (Bacillariophyta) are one of the most abundant and diverse algal groups in Arctic ecosystems. Their characteristic silica outer shell (= valve) and significant responses on changes in their physical and chemical environment make them excellent bio-indicators used in both applied environmental, biogeographical, and paleo-ecological studies.

Especially in Arctic regions diatoms proved to be very useful indicators of environmental and climatic changes. It is generally accepted that the current climate changes will have their greatest impact in the Polar regions, with the Arctic warming up to 3 times faster than the global average. It is clear that changes in temperature and moisture will have a serious impact on these Arctic communities. Especially moss-inhabiting diatoms form a special group within the polar diatom flora as they show resilience and tolerance to changing environmental conditions, such as decreasing moisture levels in their habitat, increased temperature, and destruction of their habitat due to climate change. Unfortunately, our knowledge of both the species composition of polar diatom communities and their ecological preferences are only poorly known, mainly due to historic force-fitting and incorrect species identifications.

Diatom communities in the Arctic have been studied in the past, but usually based on a too broad species concept. This most likely obscures important ecological patterns controlling their occurrence. By studying the actual Arctic diatom flora, we will try to set up the baseline data that can be used in the future to monitor the possible impacts of climatic change.

In the present proposal, we would like to extend the study of the diversity of the diatom flora in the northwestern part of Iceland, the so-called Vestfirðir (Westfjords), a sub-Arctic, almost uninhabited tundra region. Samples have been recently collected from streams, lakes, mosses, and waterfalls, together with basal physico-chemical parameters. The diatoms in the samples will be investigated using light microscopy and, when needed, scanning electron microscopy techniques. Based on our current knowledge of the diatom composition in the Arctic samples, it is likely that new species will be discovered. The obtained data will be analysed with multivariate techniques to determine the main diatom assemblages found in the Westfjords.

This proposal unfortunately does not include field work. A substantial part of the research will involve microscopical analysis.

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