

*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 2025-2026

Ecology of moss inhabiting diatom assemblages from Iles Crozet (sub-Antarctic Region): the impact of a refined taxonomy

Research group: ECOSPHERE

Hosting laboratory: Meise Botanic Garden

Promotor(s): Prof. Dr Bart Van de Vijver

Co-promotor: Margaux Pottiez (Meise Botanic Garden)



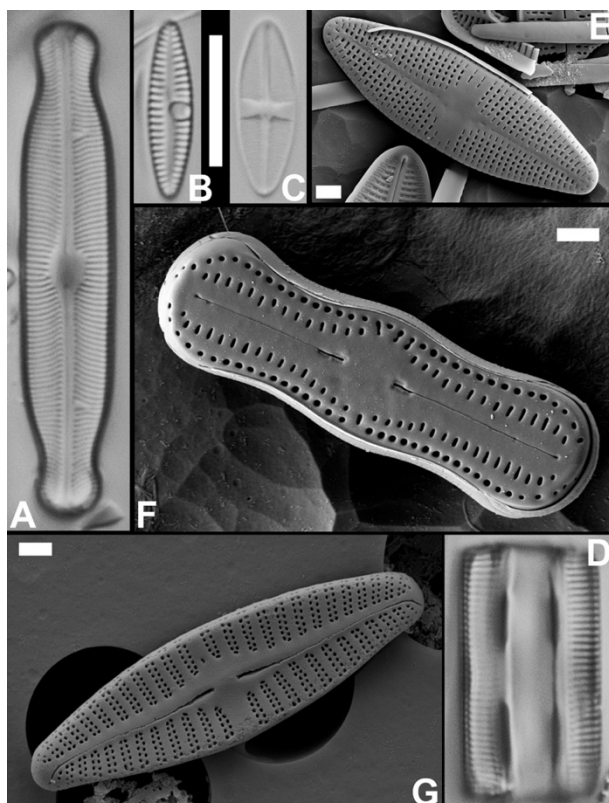
View of the Vallée des Branloires, the main valley on Ile de la Possession, Crozet archipelago

Diatoms (Bacillariophyta) are one of the most abundant and diverse algal groups in Polar ecosystems. Their characteristic silica outer shell (= valve) and the 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.

- 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:

Especially in polar 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 polar regions. 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 identifications of the composing species.

In 1999, the moss-inhabiting diatom flora was studied on Ile de la Possession, based on the old-fashioned idea that most diatoms were cosmopolitan and that the sub-Antarctic diatom flora was dominated by species formerly described from European localities. Since 2002, the sub-Antarctic diatom flora of the southern Indian Ocean, has been the subject of a severe taxonomic revision, which resulted in the description of a large number of (endemic) species. Most of the European diatom names were replaced by a native Antarctic species name. Species complexes were split into several species, often with their own specific environmental preferences.



In the present proposal, we would like to redo the ecological moss-inhabiting diatom study published in 1999, this time based on all new taxonomic insights. A selection of 50 samples will be made from various moss vegetations on Ile de la Possession, the main island of the sub-Antarctic Crozet Archipelago, situated in the southern Indian Ocean. The diatoms in the samples will be investigated using light microscopy and, when needed, scanning electron microscopy techniques. Based on past taxonomic revisions, and a better knowledge of the type material of European species, observed in the Antarctic region, it is still likely that new species will be discovered. The obtained data will be analysed with multivariate techniques to determine the main diatom assemblages found on the island. Since each sample was also environmentally characterised during sampling (pH, biotic impact, moisture level), it will be possible to

characterise the environmental preferences of each assemblage.

This proposal does not include field work. All samples have been collected during previous expeditions to the island. A substantial part of the research will involve microscopical analysis. Samples will be analysed in the Phycology lab in Meise Botanic Garden. As most of the research will be performed in Meise Botanic Garden, disposing of a personal car is a plus (but not mandatory).

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