

ABSTRACT

Diatoms (Bacillariophyta) are one of the most diverse algal groups in the Antarctic Region and play a dominant role in almost all freshwater and terrestrial ecosystems. Despite this overall occurrence, little is known about the diversity, ecology and biogeography of this group in the Maritime Antarctic Region. The main objective of this thesis is therefore to define the taxonomical, ecological and biogeographical characterisation of aquatic, semi-aquatic and moss-inhabiting diatom communities from two islands in the Maritime Antarctic Region: James Ross Island and Livingston Island, located on opposite sides of the Antarctic Peninsula.

In this study, a total of 250 samples from three different habitat types (lakes, streams & seepage areas and mosses) from Byers Peninsula (Livingston Island) and Ulu Peninsula (James Ross Island) have been analysed. Using light and scanning electron microscopy, a rather diverse diatom flora composed of 178 taxa, belonging to 43 genera has been identified. Although even until recently, it was generally accepted that the Antarctic diatom flora was mostly composed of cosmopolitan taxa, several new species could be described as a new for science during this PhD study (a reflection of this work is presented in **chapters 2 & 3** and in **Appendices**). Habitat type and geographical position of the islands seem to play a primary role in determining the composition of the diatom communities, apart from the impact of several physico-chemical parameters of their environment. The analyses of the different freshwater diatom communities on James Ross Island and Livingston Island are presented in **chapters 4, 5 & 6**. The obtained ecological preferences (in this case conductivity) were used to construct a transfer function for James Ross Island lakes diatom communities. Additionally, the moss vegetation on the islands form an important habitat for semi-aquatic and terrestrial diatoms influenced by the availability of moisture and the presence of larger marine animals. **Chapter 7** provides results of moss inhabiting diatom samples collected from Byers Peninsula and the area of Lagoons Mesa on James Ross Island. Finally, in **chapter 8** all obtained results are discussed in an attempt to compare the diatom flora from both islands, showing a clear separation between the two islands. On a broader biogeographical scale, the Maritime Antarctic Region, as represented by the two studied islands, forms a separate and well-defined biogeographical entity with a highly specific diatom flora.