ABSTRACT

The present study shows the results of a taxonomic and ecological survey on moss-inhabiting diatoms from Gough Island (40°21' S, 9°53' W). An analysis of more than 100 samples resulted in 141 identified diatom taxa, of which 21 were described by Carter (1966) and have not been reported elsewhere. Illustrative analyses of diatom communities from Tristan da Cunha and Inaccessible islands revealed an additional nine taxa, but an otherwise highly similar flora. The observed flora was highly disharmonic in its composition, represented by only a few diatom genera (*i.e. Eunotia, Pinnularia, Psammothidium* and *Chamaepinnularia*), a feature typical for oceanic islands. Also, few diatom species dominating the flora were unique to the Tristan da Cunha archipelago (Gough Island in particular) and possibly endemic, or cosmopolitan in distribution. Diatom taxa being typical for sub-Antarctic islands haven't been observed in larger amount. This, together with the highly specific diatom flora of Gough Island, resulted in very low similarity values between Gough and the other islands of southern ocean. The closest to the Tristan da Cunha archipelago based on its flora was identified to be Ile Amsterdam from the south Indian Ocean, implying the influence of west-wind drift.

To investigate the diatom flora composition, a hierarchical cluster analysis based on Bray-Curtis distances identified five significant groups, and a PCA ordination allowed a further separation of the largest group into three sub-groups. The different assemblages were explained by differences in environmental variables, and an dbRDA analysis based on species and genera level count data found altitude and sea spray to explain most variation for both, followed by moisture at the genera level. Habitat types helped to identify ecological preferences unique for the (sub-)group's assemblages but were of rather lower influence in general.

As separate papers, Chapter 3 and 4 present two studies (published or as a manuscript) handling critical sub-topics of this master thesis. Chapter 3 provides a detailed description and taxonomic evaluation of *Eunotia linearis*, a diatom species identified as *Pseudoeunotia linearis* by Carter (1966). Chapter 4 describes the complicated task of separation several species from a highly diversified (pseudo)cryptic *Frustulia crassinervia-saxonica* species complex present in the moss habitats of Gough Island.

Four appendices are attached, and present (1) an overview and taxonomical revision of diatom species identified after the historical publication of Carter (1966), (2) a list of diatom taxa observed and identified during this study from recent moss samples, (3) abstracts of posters which were presented at international meetings regarding the topic, and finally (4) a published study concerning diatom dispersal on the High Arctic archipelago of Spitsbergen.

KEYWORDS: Gough Island; Bacillariophyta; Moss-habitats; Taxonomy; Diversity; Ecology.